COTOBA DESIGN AIML Documentation

Cotobadesign

Jan 06, 2021

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CHAPTER 1

COTOBA AIMLãĄńãĄďãĄĎãĄę

COTOBA AIMLãĄĺãĄŕãĂĄCOTOBA DESIGN, Inc.ãĄőåŕ¿èľ´śãČůãČľãČČãČĹãČŢãĆľãČijãČăăĄğãĄĆãĆŃCOTOBA AgentãĄğãĂĄåŕ¿èľ´śãĆůãČŁãČłãĆŁãĆŠèĺŸèijL'ãĄŹãĆŃçĆžãĄńåĹľçŤĺãĄŹãĆŃåŕ¿èľ´śèĺĂèłđãĄğãĄŹãĂĆ AIML(Artificial Intelligence Markup Language)ãĆŠãČŹãČijãĆźãĄńCOTOBA DESIGN, Inc.ãĄŇçŃňèĞłæŃąåijţãĆŠèąŇãĄłãĄčãĄęãĄŁãĆŁãĂĄJSONãĄőåŔŰãĆŁæĽśãĄĎãĆĎAPIãĄŃãĆĽãĄőãČąãĆ£ãČĞãČijãĆ£ãĄ APIãĄőåŚijãĄşåĞžãĄŮãĄŁãĆĹãĄşæĹżãĆŁåĂd'ãĄőåŔĆçĚğãĄńãĆĹãĆŃåŕ¿èľ´śĹůå¿ąç■L'ãĂĄCOTOBA Agentäžěåd'ŰãĄőæČĚåăśãĆŠçŤĺãĄĎãĄ§åŕ¿èľ´śåĹűå¿ąãĄÑãĄğãĄ■ãĆŃãĆĹãĄĘãĄłæŃąåijţãĆŠèąŇãĄłãĄčãĄęãĄĎãĄ¿ãĄŹãĂĆ

1.1 COTOBA AIMLèíŸè£řæŰźæşŢ

åŕ¿èľ´śãĆůãČŁãČłãĆŁãĄőèíŸè£řæŰźæşŢãĄńãĄd'ãĄĎãĄęèłňæŸŐãĄŮãĄ¿ãĄŹãĂĆ ãĄŞãĄŞãĄğãĄŕåĹľçŤĺèĂĚãĄőçŹžèľ´śåĘĚåőźãĄńåŕ¿ãĄŹãĆŃãĂĄåŕ¿èľ´śãČůãČľãČČãČĹãČŢãĆľãČijãČăăĄőå£IJç■ŤãĆŠèíŸèijL

åd'L'æŢřãĄőä£ÍæŇĄãĂĄJSONãĄőåĹľçŤĺæŰźæşŢãĂĄREST APIãĄőåŚijãĄşåĞžãĄŮæŰźæşŢç■L'ãĄŕCOTOBA AIMLãČłãČŢãĆąãČňãČşãĆźãĄőåĘĚåőźãĆŠçţĎãĄ£åŘĹãĆŘãĄŻãĆŃãĄŞãĄĺãĄğãĂĄæğŸãĂĚãĄłåŕ¿èľ´śãĆůãČŁãČłãĆŁãČ

1.2 å§žælJňåŕ¿èľ´śãĆůãČŁãČłãĆŁ

åĹľçŤĺèĂĚãĄőçŹžèľ´śãĄőåĘĚåőźãĄńå£IJãĄŸãĂĄåŕ¿èľ´śãČůãČľãČČãČĹãČŢãĆľãČijãČăăĄŃãĆĽãĄőå£IJç■ŤãĆŠåőŽç¿l'ãĄŮã

categoryèęĄçt'ăăĄŕãĂĄAIMLãĄőåŕ¿èľ´śãČńãČijãČńãĄőå§žæIJňå■Ÿä¡■ãĄğãĄŹãĂĆ categoryèęĄçt'ăåĘĚãĄńãĂĄ pattern ãĄĺ template ãĄĺãĄĎãĄčãĄ§1ãĄd'ãĄőåŕ¿èľ´śãČńãČijãČńãĆŠèíŸèijL'ãĄŮãĄ¿ãĄŹãĂĆ

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">

    <category>
        <pattern>ãĄŁãĄŕãĆĹãĄĘãĄŤãĄŰãĄĎãĄ¿ãĄŹãĂĄżŁæŮěãĆĆ1æŮěéăŚåijţãĆŁãĄ¿ãĄŮãĆĞãĄĘãĂĆ</template>
    </category>

</aiml>
```

Input: ãĄŁãĄŕãĆĹãĄĘ
Output: ãĄŁãĄŕãĆĹãĄĘãĄŤãĄŰãĄĎãĄ¿ãĄŹãĂĄäżŁæŮěãĆĆ1æŮěéäŚåijţãĆŁãĄ¿ãĄŮãĆĞãĄĘ

1.3 å£IJç■ŤãĄőåĹĘåšŘ

åŕ¿èľśãĆůãČŁãČłãĆłãĆŠä¡IJæĹŘãĄŹãĆŃåăť åŘĹãĂĄåĹľçŤĺèĂĚãĄő1ãĄďåL'■ãĄőçŹžèľśãĄńå£IJãĄŸãĄęå£IJç■ŤæŰĞãĆŠåď'

ä¿ŃãĄĹãĄřãĂĄåŕ¿èľśãČŮãČľãČČãČĹãČŢãĆľãČijãČããĄŃãĆL'ãĄőåŢŔãĄĎåŘĹãĆŔãĄŻãĄńåŕ¿ãĄŮãĂĄâĂİãĄŕãĄĎ/ãĄĎãĄĎ

ãĄŞãĄőåăť åŘĹãĄőå£IJç■ŤåĹĘåšŘãĄőä¿ŃãĄĺãĄŮãĄęãĄŕãĂĄthatãĆŠåĹľçŤĺãĄŮãĄ¿ãĄŹãĂĆ

äżëäÿŃä¿ŃãĄğãĄŕãĂĄâĂİãĄŕãĄĎâĂİãĂĄâĂİãĄĎãĄĎãĄĹâĂİãĄőçţŘæđIJãĄńãĆĹãĆĹå£IJç■ŤãĆŠåď'L'ãĄĹãĄęãĄĎãĄ¿ãĄŹã
ãĄŞãĄőå£IJç■ŤãĄŕBotãĄőå£IJç■ŤãĄÑãĂĄâĂİãĆşãČijãČŠãČijãĄńçăĆçşŰãĄĺãČ§ãČńãĆŕãĆŠåĚěãĆÑãĄ¿ãĄŹãĄÑïij§âĂİãĄőæ

```
<category>
    <pattern>çğĄãĄŕãĆşãČijãČŠãČijãĄÑåě¡ãĄ■ãĄğãĄŹ</pattern>
    <template>ãĆşãČijãČŠãČijãĄńçăĆçşŰãĄĺãČ§ãČńãĆŕãĆŠåĚěãĆÑãĄ¿ãĄŹãĄÑ</template>
</category>

<category>
    <pattern>ãĄŕãĄĎ</pattern>
    <that>ãĆşãČijãČŠãČijãĄńçăĆçşŰãĄĺãČ§ãČńãĆŕãĆŠåĚěãĆÑãĄ¿ãĄŹãĄÑ</that>
    <template>ãĆŔãĄÑãĆŁãĄ¿ãĄŮãĄ§</template>
</category>

<category>
    <pattern>ãĄĎãĄĎãĄĹ</pattern>
    <that>ãĆşãČijãČŠãČijãĄńçăĆçşŰãĄĺãČ§ãČńãĆŕãĆŠåĚěãĆÑãĄ¿ãĄŹãĄÑ</that>
    <template>ãČŰãČl'ãČČãĆŕãĄğãĄŹãĄ■</template>
</category>
```

Input: çğĄãĄŕãĆşãČijãČŠãČijãĄÑåě¡ãĄ■ãĄğãĄŹ
Output: ãĆşãČijãČŠãČijãĄńçăĆçşŰãĄĺãČ§ãČńãĆŕãĆŠåĚěãĆÑãĄ¿ãĄŹãĄÑ
Input: ãĄŕãĄĎ
Output: ãĆŔãĄÑãĆŁãĄ¿ãĄŮãĄ§

1.4 åŕ¿èľśåĘĚåőźãĄőæŁ¡åĞžãĂĄåď'L'æŢřåĹľçŤĺ

åĹľçŤĺèĂĚãĄőçŹžèľśãĄőåĘĚåőźãĆŠæŁ¡åĞžãĄŹãĆŃãĄńãĄŕâĂİ*âĂİãĄĺstarãĆŠåĹľçŤĺãĄŮãĄ¿ãĄŹãĂĆãĄ¿ãĄ§ãĂĄåĹľçŤĺèĂ

1ãĄď'çŻõãĄőçŹžèľśãĄğãČŽãČČãČĹãĄőçĺŐéąđãĆŠä£ÍæŇĄãĄŮãĄ¿ãĄŹãĂĆãĄİãĄőéŽŻåĹľçŤĺèĂĚãĄőçŹžèľśpatternãĄőãČŽãĆ

åď'L'æŢřãĄőåĹľçŤĺãĄŕset/getãĆŠä¡£çŤĺãĄŮãĄ¿ãĄŹãĂĆsetãĄőåšđæĂğãĄğæŇĞåőŽãĄŮãĄ§åŘ■çğřpetcategoryãĄńsetãĄőåĘĚå

æňąãĄőçŹžèľśãĄğãĄŕãĂĄåĹľçŤĺèĂĚãĄőãČŽãČČãČĹãĄőåŘ■åL'■ãĆŠä£ÍæŇĄãĄŮãĄ¿ãĄŹãĂĆåŘŇæğŸãĄńsetãĆŠçŤĺãĄĎä£Íã

æňąãĄőçŹžèľśãĄğãĄŕãĂĄä£ÍæŇĄãĄŮãĄ§åĘĚåőźãĆŠåĹľçŤĺãĄŮåŕ¿èľśãČŮãČľãČČãČĹãČŢãĆľãČijãČããĄŃãĆL'ãĄőå£IJç■Ťã

åď'L'æŢřãĄőåĘĚåőźãĄńãĆĹãĆŃåĹĘåšŘãĄŕãĂĄconditionãĆŠåĹľçŤĺãĄŮãĄ¿ãĄŹãĂĆconditionãĄŕåŕ¿èśąãĄĺãĄłãĆŃåď'L'æŢřãĄ
caseãĄőãĆĹãĄĘãĄłåĞęçŘĘãĆŠèÍŸèijL'ãĄŹãĆŃãĄŞãĄĺãĄŃãĄğãĄ■ãĄ¿ãĄŹãĂĆ

äżëäÿŃãĄőä¿ŃãĄğãĄŕãĂĄãČŽãČČãČĹãĄőçĺŐéąđpetcategoryãĄŃâĂİçĽńâĂİãĄŃâĂİçŃńâĂİãĄŃãĆŠswitch-
caseæŰĞãĄőcaseãĄńå¡ŞãĄ§ãĆŃliãĄğåĹĘåšŘãĄŮãĄ¿ãĄŹãĂĆãĄĽ'ãĄąãĆL'ãĄğãĆĆãĄłãĄŃãĄčãĄ§åăť åŘĹæIJłèľŢä¿ąçţŘæđIJã

ãĄ¿ãĄ§ãĂĄè£Ťç■ŤãĄőåĘĚåőźãĄńpetnameãĄğä£ÍæŇĄãĄŮãĄ§åĘĚåőźãĆŠè£ŤãĄŮãĄęãĄĎãĄ¿ãĄŹãĂĆ

```
<category>
    <pattern>çğĄãĄőãČŽãČČãČĹãĄŕ*ãĄğãĄŹ</pattern>
    <template>
        <think><set name="petcategory"><star /></set></think>
        <star/>ãĄŇåě¡ãĄ■ãĄłãĆŞãĄğãĄŹãĄ■
    </template>
</category>

<category>
    <pattern>ãČŽãČČãČĹãĄőåŘ■åL’■ãĄŕ*ãĄğãĄŹ</pattern>
    <template>
        <think><set name="petname"><star /></set></think>
        ãĄĎãĄĎåŘ■åL’■ãĄğãĄŹãĄ■ãĂĆ
    </template>
</category>

<category>
    <pattern>çğĄãĄőãČŽãČČãČĹèęŽãĄĹãĄęãĆŃïij§</pattern>
    <template>
        <condition name="petcategory">
            <li value="çŁń">ãĄĆãĄłãĄ§ãĄőãČŽãČČãČĹãĄŕçŁñãĄő<get name="petname" />
↪ãĄğãĄŹãĆĹãĄ■</li>
            <li value="çŇń">ãĄĆãĄłãĄ§ãĄőãČŽãČČãČĹãĄŕçŇńãĄő<get name="petname" />
↪ãĄğãĄŹãĆĹãĄ■</li>
            <li>ãČŽãČČãČĹãĄŕéčijãĄčãĄęãĄĎãĄłãĄŃãĄčãĄ§ãĆĹãĄ■</li>
        </condition>
    </template>
</category>
```

Input: çğĄãĄőãČŽãČČãČĹãĄŕçŁñãĄğãĄŹãĂĆ
Output: çŁñãĄŇåě¡ãĄ■ãĄłãĆŞãĄğãĄŹãĄ■ãĂĆ
Input: ãČŽãČČãČĹãĄőåŘ■åL’■ãĄŕãČđãČ■ãČşãĄğãĄŹãĂĆ
Output: ãĄĎãĄĎåŘ■åL’■ãĄğãĄŹãĄ■ãĂĆ
Input: çğĄãĄőãČŽãČČãČĹèęŽãĄĹãĄęãĆŃïij§
Output: ãĄĆãĄłãĄ§ãĄőãČŽãČČãČĹãĄŕçŁñãĄőãČđãČ■ãČşãĄğãĄŹãĆĹãĄ■ãĂĆ

1.5 BOTéĂčæŘž

èď’ĞæŢřBOTãĆŠä¡IJæĹŘãĄŮåŘĎãĂĚãĄőçţŘæđIJãĆŠéĂčæŘžãĄŮåŃŢä¡IJãĄŢãĄŻãĆŃãĄŞãĄĺãĄŇãĄğãĄ■ãĄ¿ãĄŹãĂĆREST
æśŐçŤĺRESTãĆd’ãČşãĆ£ãČŢãĆğãČijãĆź ãĆŠåĽ’çŤĺãĄŮãĄ¿ãĄŹãĂĆ äżěäÿŃãĄőãĆĹãĄĘãĄńãĂĄæŮćãĄń¡IJæĹŘãĄŮãĄ§ãČ

BOTãĄŇãĆL’ãĄőæĹżãĆŁåĂd’ãĄŕãĂĄvar:__SUBAGENT_BODY__ãĄńåŘńãĄ¿ãĆŇãĄęãĄŁãĆŁãĂĄjsonèęAçt’ãäĄğåŔŰãĆŁåČ

```
<?xml version="1.0" encoding="UTF-8"?>

<aiml version="2.0">
    <category>
        <pattern>ãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹ*</pattern>
        <template>
            <think>
                <json var="body.utterance"><star /></json>
                <json var="body.userId"><get var="__USER_USERID__" /></json>
                <sraix>
                    <host>https://HOSTNAME/bots/BOT_ID/ask</host>
                    <method>POST</method>
                    <header>"Content-Type":"application/json;charset=UTF-8"</
↪header>
```

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```
                    <body><json var="body" /></body>
                </sraix>
            </think>
            <json var="__SUBAGENT_BODY__.response" />
        </template>
    </category>
</aiml>
```

sraixèęAçt'ãäĄőåśđæĂğ `botName`
ãĆŠæŇĞåőŽãĄŹãĆŃãĄŞãĄÍãĄğãĂĄBOTãĄõãĆÍãĆd'ãČłãĆćãĆźåőŽç¿l'ãĆŠåĹl'çŤÍãĄŮãĄęåŕ¿BOTåřĆçŤÍãĄõéĂŽä£ąåĞęçŘĘã

èl'şçt'řãĄńãĄd'ãĄĎãĄęãĄŕãĂĄ*åŕ¿èl'śãČŮãČl'ãČČãČĹãČŢãĆl'ãČijãČäãĄğãĂĄåĚňéŰŃãĄŢãĆŇãĄęãĄĎãĆŃbotåŚijãĄşåĞžãĄ*
ãĆŠåŔĆçĔğãĄŮãĄęãĄŔãĄäãĄŢãĄĎãĂĆ

ãĆÍãĆd'ãČłãĆćãĆźåőŽç¿l'ãĆŠåĹl'çŤÍãĄŮãĄęåŘŇãĄŸåĞęçŘĘãĆŠèąŇãĄĘåät'åŘĹãĂĄãĄ¿ãĄŽãĂĄãĆÍãĆd'ãČłãĆćãĆźãĄőçŹžéł

```
bot:
  ALIAS_NAME:
    url: https://HOSTNAME/bots/BOT_ID/ask
```

ãĆůãČŁãČłãĆłãĄőèÍŸè£řãĄŕäžĕäÿŇãĄőæğŸãĄńçřąçŢĕåŇŰãĄŢãĆŇãĄ¿ãĄŹãĂĆ

```
<?xml version="1.0" encoding="UTF-8"?>

<aiml version="2.0">
    <category>
        <pattern>ãĆţãČŰãĆÍãČijãĆÿãĆğãČşãČĹ*</pattern>
        <template>
            <sraix botName="ALIAS_NAME">
                <star />
            </sraix>
        </template>
    </category>
</aiml>
```

1.6 æĎŔåŻşèğčéĞĹãĆÍãČşãĆÿãČşéĂčæŘž

æĎŔåŻşèğčéĞĹãĆÍãČşãĆÿãČşãĄğ¡IJæĹŘãĄŮãĄ§ãČćãČĞãČńãĆŠçŤÍãĄĎãĆŃåät'åŘĹãĂĄæŐÍèńŰãĆÍãČşãČL'ãČÍãĆd'ãČşãČĹ

NLUèęAçt'ãäĆŠåĹl'çŤÍãĄŮæĎŔåŻşèğčéĞĹãĆÍãČşãĆÿãČşãĄőãĆd'ãČşãČEąČşãČĹãĄńãĆĹãĆŃpatternåĹĘåšŘãĆůãČŁãČłãĆłãĆ

ãĄ¿ãĄ§ãĂĄåŕ¿èl'śãČŮãČl'ãČČãČĹãČŢãĆl'ãČijãČäãĄŕãĆůãČŁãČłãĆłãĄőèÍŸè£řãĄńå¿ŞãĄĎãČńãČijãČńãČŹãČijãĆźãĄőæĎŔåŻ
ãĆŠåŔĆçĔğãĄŮãĄęãĄŔãĄäãĄŢãĄĎãĂĆ

äžĕäÿŇãĄőä¿ŃãĄğãĄŕãĂĄæĎŔåŻşèğčéĞĹãĆÍãČşãĆÿãČşãĄőåĞęçŘĘçţŘædIJãĄŇâĂİãČńãĆźãČĹãČl'ãČşæd'IJçt'ćâĂİãĄäãĄčã

```
<aiml version="2.0">
    <category>
        <pattern>
            <nlu intent="ãČńãĆźãČĹãČl'ãČşæd'IJçt'ć" />
        </pattern>
        <template>
            <think>
                <set var="count">0</set>
                <set var="slotCount"><nluslot name="*" item="count" /></set>
            </think>
```

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```
            <condition>
                <li var="count"><value><get var="slotCount" /></value></li>
                <li>
                    slot:<nluslot name="*" item="slot"><index><get var="count" /></
↪index></nluslot>
                    entity:<nluslot name="*" item="entity"><index><get var="count"␣
↪/></index></nluslot>
                    <!-- score:<nluslot name="*" item="score"><index><get var=
↪"count" /></index></nluslot> -->
                    <think>
                        <set var="count"><map name="upcount"><get var="count" /></
↪map></set>
                    </think>
                    <loop />
                </li>
            </condition>
        </template>
    </category>
</aiml>
```

åřŽãĂąsraixèęĄçťăăĄőåśđæĂğ `nlu` ãĆŠæŇĞåőŽãĄŹãĆŃãĄŞãĄÍãĄğãĂĄçL'źåőŽãĄőN-
LUãĆţãČijãČŘãĄÍçŻť'æŐěéĂŽä£ąãĆŠèąŇãĄčãĄęãĂĄæĎŘåŻşèğčéĞĹãĆÍãČşãĆÿãČşãĄőåĞęçŘEçţŘæđIJãĆŠåŔŰå¿ŮãĄŹãĆŃã
èl'şçť'řãĄńãĄd'ãĄĎãĄęãĄfãĂĄSubAgentãĄő *NLUéĂŽä£ąãĆd'ãČşãĆ£ãČŢãĆğãČijãĆź*
ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăăĄŢãĄĎãĂĆ

CHAPTER 2

çŤÍèłđéŻĘ

æIJňçńäãĄğãĄŕãČL'ãĆ■ãČěãČąãČşãČĹäÿ■ãĄğçŤÍãĄĐãĆŃçŤÍèłđãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ

2.1 å ŕ¿èl'śåĞęçŘĘãĄńãĄ¿ãĄd'ãĆŔãĆŃçŤÍèłđ

æIJňãĆżãĆŕãĆůãČğãČşãĄğãĄŕãĂąãČL'ãĆ■ãČěãČąãČşãČĹäÿ■ãĄğçŤÍãĄĐãĆŃå ŕ¿èl'śåĞęçŘĘãĄńãĄ¿ãĄd'ãĆŔãĆŃçŤÍèłđãĆŠåő

çŤÍèłđ	åőŽç¿l'
å ŕ¿èl'śãĆůãČŁãČłãĆł	å ŕ¿èl'śåĞęçŘĘãĄőåő§èąŇãĄńéŰćãĆŔãĆŃåĞęçŘĘãČŮãČ■ãĆřãČl'ãČăãĆĎãČĞãČijãĆ£ãĆŠèÍŸè£řãĄŮå ŕ¿èl'śãĆćãČ AIML (Artificial Inteligence Markup Language) ãĄğèÍŸè£řãĄŹãĆŃãĂĆ
éŰŃçŹżèĂĚ	å ŕ¿èl'śåĞęçŘĘãĄőãČŮãČ■ãĆřãČl'ãČăãĆĎãČĞãČijãĆ£ãĆŠèÍŸè£řãĄŮå ŕ¿èl'śãĆćãČ
å ŕ¿èl'śãĆÍãČşãĆÿãČş	å ŕ¿èl'śãĆůãČŁãČłãĆłãĆŠçŹżéŇšãĄŮãĄęå ŕ¿èl'śåĞęçŘĘãĆŠåő§èąŇãĄŹãĆŃåő§èąŇ
ãČIJãČČãČĹ	å ŕ¿èl'śãĆÍãČşãĆÿãČşãĄńå ŕ¿èl'śãĆůãČŁãČłãĆłãĄŃçŹżéŇšãĄŢãĆŇãĄęå ŕ¿èl'śåĞęçŘ
ãČęãČijãĆű	ãČIJãČČãČĹãĄńå ŕ¿ãĄŮãĄęå ŕ¿èl'śåĞęçŘĘãĆŠèĘąśĆãĄŹãĆŃèĂĚãĂĆ
ãĆůãĆźãČĘãČă	ãČIJãČČãČĹãĄőåĹěçğřãĂĆãČęãČijãĆűãĄĺå ŕ¿ærŤãĄŹãĆŃæŰĞèĎĹãĄğçŤÍãĄĐãĆ
ãČłãĆŕãĆÍãĆźãČĹ	ãČęãČijãĆűãĄŇãČIJãČČãČĹãĄńå ŕ¿ãĄŮãĄęèąŇãĄĘå ŕ¿èl'śåĞęçŘĘèĘąśĆãĂąãĂĄ
ãČňãĆźãČİãČşãĆź	ãČIJãČČãČĹãĄŇå ŕ¿èl'śåĞęçŘĘãĆŠèąŇãĄčãĄęãČęãČijãĆűãĄńè£ŤãĄŹå ŕ¿èl'śåĞęç
çŹżèl'śæŰĞ	ãČłãĆŕãĆÍãĆźãČĹãĄńåŘńãĄ¿ãĆŇãĂĄãČęãČijãĆűãĄŇãČIJãČČãČĹãĄńéĂąä£ąãĂ
å£IJç■ŤæŰĞ	ãČňãĆźãČİãČşãĆźãĄńåŘńãĄ¿ãĆŇãĂĄãČIJãČČãČĹãĄŇãČęãČijãĆűãĄńè£Ťä£ąãĂ
énŸåžęæĎŘåŽşèğčéĞĹ	æl'§æćŕå■ęç£ŠãČćãČĞãČńãĄńãĆĹãĆŁçŹżèl'śæŰĞãĄőæĎŘåŽş(ãĆd'ãČşãČEãČşãČ
å ŕ¿èl'śãĆ■ãĆř	å ŕ¿èl'śãĆÍãČşãĆÿãČş(ãČIJãČČãČĹ)ãĄŇåő§èąŇãĄŮãĄ§å ŕ¿èl'śåĞęçŘĘãĄőåŃŢä¡IJ
ãĆţãČŰãĆÍãČijãĆÿãĆğãČşãČĹ	ãĄĆãĆŇãČIJãČČãČĹãĄŇãĂĄçL'źåőŽãĄőå ŕ¿èl'śåĞęçŘĘãĆĎãĄĮãĄőäżŰãĄőæČĚ (SubAgent) ãĄĺãĆĆèÍŸãĄŹãĂĆ
ãČąãĆd'ãČşãĆÍãČijãĆÿãĆğãČşãČĹ	ãĆţãČŰãĆÍãČijãĆÿãĆğãČşãČĹãĆŠåŚijãĄşåĞžãĄŹåŢ'ãĄőãČIJãČČãČĹãĂĆMA (MainAgent) ãĄĺãĆĆèÍŸãĄŹãĂĆ

2.2 cAIML

æIJňãĆżãĆŕãĆůãČğãČşãĄğãĄŕãĂąãČL'ãĆ■ãČěãČąãČşãČĹäÿ■ãĄğçŤÍãĄĐãĆŃ cAIML (COTOBA AIML) ãĄńãĄ¿ãĄd'ãĆŔãĆŃçŤÍèłđãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ

çŤĺèłđ	åőŽç¿ľ
AIML	Artificial Inteligence Markup Language ãĄőçŢěçğřãĂĆåŕ¿èľśåĞęçŘĘãČŮãČ■ãĆřãČľãČăãĄőèÍŸè£řèÍĂèłđ ãĄŕ XML å¡ćåijŔãĄğèÍŸè£řãĄŹãĆŃãĂĆ
cAIML	COTOBA AIML ãĄőçŢěçğřãĂĆCOTOBA DESIGN ãĄńãĆĹãĆŃçŃňèĞłäżŢæğŸæŃąåijţãĆŠåŘńãĆĂ AIMLãĂĆ
ãĆ£ãĆř	XML ãĄőå§žæIJňæğŃéĂăãĆŠèęŔåőŽãĄŹãĆŃãĆ£ãĆř(éŰŃåğŃãĆ£ãĆř âĂŸ<âĂę>âĂŹãĂĄçţĆäžĘãĆ£ãĆř âĂŸ</âĂę>âĂŹ)ãĄőãĄĘãĄą cAIML ãĄğåőŽç¿ľãĄŢãĆŃãĄ§ãĆĆãĄőãĂĆ
èęĄçť˘ă	ãĆ£ãĆřãĆŠæğŃæĹŘãĄŹãĆŃäÿżæğŃæĹŘèęĄçť˘ăãĂĆéŰŃåğŃãĆ£ãĆř âĂŸ<èęĄçť˘ă>âĂŹãĂĄçţĆäžĘãĆ£ãĆř âĂŸ</èęĄçť˘ă>âĂŹ ãĄőèÍŸæşŢãĄğèÍŸè£řãĄŢãĆŃãĆŃãĂĆ
åśđæĂğ	ãĆ£ãĆřãĆŠæğŃæĹŘãĄŹãĆŃãĆţãČŰæğŃæĹŘèęĄçť˘ăãĂĆéŰŃåğŃãĆ£ãĆř âĂŸ<èęĄçť˘ă åśđæĂğ=âĂİåĂd'âĂİ>âĂŹ ãĄőèÍŸæşŢãĄğèÍŸè£řãĄŢãĆŃãĆŃãĂĆåśđæĂğãĄŕèd'ĞæŢřãĄĆ
åĘĚåőź	éŰŃåğŃãĆ£ãĆřãĄĺçţĆäžĘãĆ£ãĆřãĄőéŰŞãĄńèÍŸè£řãĄŢãĆŃãĆŃæŰĞå■ŮåĹŮãĂĆâĂŹ<èęĄçť˘ă åśđæĂğ=âĂİåĂd'âĂİ>åĘĚåőź</èęĄçť˘ă>âĂŹ ãĄőèÍŸæşŢãĄğèÍŸè£řãĄŢãĆŃãĆŃãĂĆåĘĚåőźãĄńãĄŕæŰĆ cAIML ãĄŕ XML åŘŃæğŸãĂĄåĚěãĆŃå■ŘæğŃéĂăãĄőèÍŸè£řå¡ćåijŔãĄĺãĄłãĆŃãĂĆ
èęĄçť˘ăåŘ■	çĽźåőŽãĄőèęĄçť˘ăãĆŠæŇĞåőŽãĄŹãĆŃãĄ§ãĆĄãĄőåŘ■çğřãĂĆ
åśđæĂğåŘ■	çĽźåőŽãĄőåśđæĂğãĆŠæŇĞåőŽãĄŹãĆŃãĄ§ãĆĄãĄőåŘ■çğřãĂĆ
åśđæĂğåĂd'	åśđæĂğãĄńèĺ■åőŽãĄŹãĆŃåĂd'ãĂĆcAIML ãĄğåśđæĂğåĂd'ãĄĺãĄŮãĄęèÍŸè£řãĄŹãĆŃåăt'åŘĹãČĂãČŰ
ãČŰãČ■ãČČãĆŕ	åĘĚåőźãĆŠåŘńãĆŞãĄäãĄĆãĆŃèęĄçť˘ăåĚĺä¡Ş(år¿å£IJãĄŹãĆŃéŰŃåğŃãĆ£ãĆřãĄŃãĆĽçţĆäžĘãĆ£ãĆřã
ãČŐãČijãČĽ	cAIML ãĄő XML å¡ćåijŔãĄőãČĞãČijãĆ£ægŃéĂăãĆŠæIJĺægŃéĂăãĄĺèęŃãĄ§æŹĆãĄőèęĄçť˘ăãĄńçŻÿå¡
NLU	cAIML ãĄŃãĆĽåŠijãĄşåĞžãĄŹéńŸåžęæĎŔåŽşèğčéĞĹæľ§èČ¡ãĆŠæŇĞãĄŹãĂĆ

CHAPTER 3

COTOBA Agent dialog engine API

3.1 åŕ¿èľśAPI

åŕ¿èľśãĆÍãČşãĆÿãČşãĆŠREST APIãĆŕãČľãĆź(programy.clients.restful.yadlan.sanic.client)ãĆŠçŤÍãĄĎãĄęçńÑãĄąäÿŁãĄŠãĄ§åă
ãČęãČijãĆűãĄőçŹžèľśæŰĞãĆŠåŘńãĆĂãČłãĆŕãĆÍãĆźãČĹãĆŠãČIJãČČãČĹãĄńéĂĄä£ąãĄŮãĂĄãČIJãČČãČĹãĄÑãĆĽãĄőå£IJç

éăĚçŽő	åĘĚåőź
ãČŮãČ■ãČĹãĆşãČń	HTTP
ãČąãĆ¡ãČČãČĽ	POST

3.1.1 ãČłãĆŕãĆÍãĆźãČĹ

åŕ¿èľśAPIãČłãĆŕãĆÍãĆźãČĹãĄńèĺ■åőŽãĄŹãĆŃåĘĚåőźãĄğãĄŹãĂĆ

- ãČłãĆŕãĆÍãĆźãČĹãČŸãČČãČĂ

ãČŢãĆčãČijãČńãČĽåŘ■		èłňæŸŐ
Content-Type	application/json;charset=UTF-8	ãĆşãČşãČĘãČşãČĹãĆ£ãĆd'ãČŮãĄğJSONãĂĄæŰĞå■ŮãĆşãČijãČL'ãĄ

- ãČłãĆŕãĆÍãĆźãČĹãČIJãČĞãĆč

éäĚçŻőåŘ■		ãĆ■ãČij	åđŃ	å£ĚéäĹ	èłňæŸŐ
ãČ■ãĆśãČijãČń		locale	string	No	èÍĂèłđãĆşãČijãČL'ãĄÍISO-639 èÍĂèłđãĆşãČijãČL'ãĄÍISO-3166 åŻ¡ãĆşãČijãČL'ãĆŠãČŔãĆď'ãČŢãČşçźÑãĄĎãĄăçţĎã JP, en-US, zh-CNãĂĆ æIJłæŇĞåőŽãĄőåăť'åŘĹãĂĄãČIJãČČãČĹåĄţ'ãĄğèę
æŹĆéŰŞæČĚåăś		time	string	No	ãČłãĆŕãĆÍãĆźãČĹåĄţ'æŹĆåĹżãĂĆISO8601(RFC333 07-01T12:18:45+09:00ãĂĆ æIJłèĺ■åőŽãĄőåăť'åŘĹãĆţãČijãČŘæŹĆåĹżãĄğåŃŢä¡
ãČęãČijãĆűID		userId	string	Yes	ãČęãČijãĆűæŕŐãĄőãČęãČŃãČijãĆŕãĄIDãĆŠæŇĞåĆ
ãČĹãČŤãČČãĆŕID		topic	string	No	åŕ¿èl'śãĆůãČŁãČłãĆłãĄğèÍŸèijL'ãĄŮãĄ§ãĆůãČŁãČł
ãČęãČijãĆűçŹžèl'ś		utterance	string	Yes	ãČęãČijãĆűãĄőçŹžèl'śæŰĞãĂĆ
ãĆ£ãĆźãĆŕåď'L'æŢřåL'ŁéŹď		deleteVariable	boolean	No	trueãĆŠèĺ■åőŽãĄŽãĆŃãĄÍAIMLèÍŸè£řãĄőset/getãĄ data ãĄğèĺ■åőŽãĄŮãĄ§åď'L'æŢřãĆŠäÿĂæŃňãĄğåL'ŁéŹd
ãČąãĆ£ãČĞãČijãĆ£		metadata	string	No	JSONå¡ćåijŔãĄőãČąãĆ£ãČĞãČijãĆ£ãĂĄãĆĆãĄŮãĄ *åŕ¿èl'śAPIãČĞãČijãĆ£ãĄőåď'L'æŢřåĹl'çŤĺ* ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăăĄŢãĄĎãĂĆ
ãĆşãČşãČŢãĆčãĆř		config		No	åŕ¿èl'śãĆÍãČşãĆÿãČşåŃŢä¡IJçŁűæĚŃãĄńéŰćãĄŹãĆ
	ãČ■ãĆřãČňãČŹãČřogLevel	string	No	åŕ¿èl'śãĆÍãČşãĆÿãČşãĄőåŕ¿èl'śãĆ■ãĆřãĄőåĞžåŁŻãČ

- ãČłãĆŕãĆÍãĆźãČĹä¿Ń

```
POST /v1.0/ask HTTP/1.1
Host: www.***.com
Accept: */*
Content-Type: application/json;charset=UTF-8

{
    "locale": "ja-JP",
    "time": "2018-07-01T12:18:45+09:00",
    "userId": "E8BDF659B007ADA2C4841EA364E8A70308E03A71",
    "topic": "greeting",
    "utterance": "ãĄŞãĆŞãĄńãĄąãĄŕ",
    "deleteVariable": false,
    "metadata": {"arg1":"value1","arg2":"value2"},
    "config": {"logLevel":"debug"}
}
```

3.1.2 ãČňãĆźãČÍãČşãĆź

åŕ¿èl'śAPIãČłãĆŕãĆÍãĆźãČĹãĄńåŕ¿ãĄŹãĆŃãČňãĆźãČÍãČşãĆźãČIJãČĞãĆčãĄŕJSONå¡ćåijŔãĄğãĄŹãĂĆ
åŕ¿èl'śAPIãČłãĆŕãĆÍãĆźãČĹãĄńåŕ¿ãĄŹãĆŃãČňãĆźãČÍãČşãĆźãĆşãČijãČL'ãĄőäÿĂèęğãĄŕäžěäÿŃãĄőãĄÍãĄŁãĆŁãĄğãĄŹãĂĆ
åŕ¿èl'śãĆÍãČşãĆÿãČşåĘĚãĄőåĞęçŘĘäžěåď'ŰãĄńèţůåŽãĄŹãĆŃãČňãĆźãČÍãČşãĆźãĆşãČijãČL'(äžěäÿŃäÿĂèęğäžěåď'ŰãĄőHTT
ãĄÍãĄőåăť'åŘĹãĄőãČňãĆźãČÍãČşãĆźãČIJãČĞãĆčãĄőåĘĚåőźãĄŕäÿ■åőŽãĄğãĄŹãĂĆ

- ãČňãĆźãČÍãČşãĆźãĆşãČijãČL'

ãĆşãČijãČL'	èłňæŸŐ
200	ãČłãĆŕãĆÍãĆźãČĹæ■čåÿÿçţĆäžĘãĂĆ
400	ãČŠãČľãČąãČijãĆ£ãĆÍãČľãČijãĂĆãČłãĆŕãĆÍãĆźãČĹãĄőåĘĚåőźãĄőèęŃçŻţ'ãĄŮãĄŃå£ĚèęĄãĄğãĄŹãĂ

- ãČňãĆźãČÍãČşãĆźãČŸãČČãČĂ

ãČŢãĆčãČijãČńãČĽåŘ■	èłňæŸŐ
Content-Type	application/json;charset=UTF-8

- ãČňãĆźãČÌãČşãĆźãČIJãČĞãĆč

éăĚçŻőåŘ■	ãĆ■ãČij	åđŃ	å£ĚéãĹ	èłňæŸŐ
ãČęãČijãĆűçŹžèľś	utterance	string	Yes	åŕ¿èľśãĆÍãČşãĆÿãČşåĘĚéČÍãĄğåĞęçŘĘãĆŠèąÑãĄčãĄ§ãČę
ãČęãČijãĆűID	userId	string	Yes	ãČęãČijãĆűæŕŐãĄőãČęãČŃãČijãĆŕãĄłIDãĆŠæŇĞåőŽãĄŮã
å£IJç■ŤæŰĞ	response	string	Yes	åŕ¿èľśãĆÍãČşãĆÿãČşãĄŃãĆL'å£IJç■ŤæŰĞãĂĆUTF8ãĄőæŰ
ãČĹãČŤãČČãĆŕåŘ■	topic	string	Yes	çŔ¿åIJÍãĄőãČĹãČŤãČČãĆŕåŘ■ãĂĆ
ãČňãĆd'ãČĘãČşãĆů	latency	number	Yes	ãĆÍãČşãĆÿãČşåĘĚåĞęçŘĘæŹĆéŰŞãĂĆãČłãĆŕãĆÍãĆźãČĹãC
ãČąãĆ£ãČĞãČijãĆ£	metadata	string	No	JSONå¡ćåijŔãĄőãČąãĆ£ãČĞãČijãĆ£ãĂĄãĆĆãĄŮãĄŔãĄŕæ

- ãČňãĆźãČÌãČşãĆźä¿Ń

```
HTTP/1.1 200 Ok
Content-Type: application/json;charset=UTF-8

{
    "response": "ãĄŞãĆŞãĄńãĄąãĄŕãĂĄäżŁæŮěãĆĆãĄĎãĄĎåd'l'ærŮãĄğãĄŹãĄ■",
    "userId": "E8BDF659B007ADA2C4841EA364E8A70308E03A71",
    "topic": "greeting",
    "latency":0.0317230224609375,
    "utterance": "ãĄŞãĆŞãĄńãĄąãĄŕ"
}
```

é§şæě¡åĘ■çŤ§ãĄńåŕ¿å£IJãĄŮãĄ§åŕ¿èľśãĆůãČŁãČłãĆŁãĄğâĂİæňąãĄőæŻšãĆŠåĘ■çŤ§âĂİãĄÍçŹžèľśãĄŮãĂĄmetadataãĄńåĘ■çŤ

```
HTTP/1.1 200 Ok
Content-Type: application/json;charset=UTF-8

{
    "response": "æňąãĄőæŻšãĆŠåĘ■çŤ§ãĄŮãĄ¿ãĄŹãĄ■",
    "userId": "E8BDF659B007ADA2C4841EA364E8A70308E03A71",
    "topic": "music_play",
    "latency":0.0317230224609375,
    "utterance": "ãĄŞãĆŞãĄńãĄąãĄŕ",
    "metadata": {"play":"next"}
}
```

3.2 ãČĞãČŘãČČãĆřAPI

ãČĞãČŘãČČãĆřAPIãĄŕãĂĄãĆćãČČãČŮãČ■ãČijãČL'ãĄŢãĆŃãĄ§zipãĆćãČijãĆńãĆd'ãČŰãĄőåŕ¿èľśãĆůãČŁãČłãĆŁãČŢãĆąãĆd'
éĄŐåŐżãĄőåŕ¿èľśãĆŠåŘńãĆĄãĄ§åŕ¿èľśçŁűæĚŃãĆŠåŘŰå¿ŮãĄŹãĆŃãĄŞãĄÍãĄÑãĄğãĄ■ãĄ¿ãĄŹãĂĆãĄ¿ãĄ§ãĂĄåŕ¿èľśäÿ■ã

éăĚçŻő	åĘĚåőź
ãČŮãČ■ãČĹãĆşãČń	HTTP
ãČąãĆ¡ãČČãČL'	POST

3.2.1 ãČłãĆŕãĆÍãĆźãČĹ

ãČĞãČŘãČČãĆřAPIãČłãĆŕãĆÍãĆźãČĹãĄńèÍ■åőŽãĄŹãĆŃåĘĚåőźãĄğãĄŹãĂĆ
ãČĞãČŘãČČãĆřAPIãĆÍãČşãĆL'ãČÌãĆd'ãČşãČĹãĄńãĄŕäžŃåL'■ãĄńçŹżéÑšãĄŮãĄ§ãČęãČijãĆűãĄőãĄ£ãĄÑãĆćãĆŕãĆżãĆźãĄğã

- ãČłãĆŕãĆÍãĆźãČĹãČŸãČČãČĂ

ãČŢãĆčãČijãČńãČĽåŘ■		èłňæŸŐ
x-dev-key	yyyyyyyyyyyyyyyy	*user-information* ãĄőx-dev-keyãĄğåŔŰå¿ŮãĄŮãĄ§APIãĆ■ãČijãĆŠæŇĞåőŽ
Content-Type	application/json;charset=UTF-8	ãĆşãČşãČĘãČşãČĹãĆ£ãĆd'ãČŮãĄğJSONãĂĄæŮ

- ãČłãĆŕãĆĺãĆźãČĹãČIJãČĞãĆč

éăĚçŽőåŘ■		ãĆ■ãČij	åđŃ	å£Ěéă	èłňæŸŐ
ãČęãČijãĆűID		userId	string	No	ãČęãČijãĆűæŕŐãĄőãČęãČŃãČijãĆŕãĄIDãĆŠæŇĞåő
åd'L'æŢřãČłãĆźãČĹ		variables		No	åĂd'ãĆŠèĺ■åőŽãĄŹãĆŃåd'L'æŢřãĄőæČĚåăśãĆŠãČłã
	åd'L'æŢřãĆ£ãĆd'ãČŸpe		string	No	åd'L'æŢřãĆ£ãĆd'ãČŮãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆæ âĂŸnameâĂŹãĆĆãĄŮãĄŔãĄŕ âĂŸdataâĂŹ ãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ(keyïijÑvalueãĄĺãĄĺãĆĆãĄń
	åd'L'æŢřåŘ■	key	string	No	åĂd'ãĆŠèĺ■åőŽãĄŹãĆŃåd'L'æŢřåŘ■ãĆŠæŇĞåőŽãĄ
	åĂd'	value	string	No	åd'L'æŻt'ãĄŹãĆŃåĂd'ãĆŠèĺŸèijL'ãĄŮãĄ¿ãĄŹãĂĆ(t

- ãČłãĆŕãĆĺãĆźãČĹä¿Ń

```
POST / HTTP/1.1
Host: www.***.com
Accept: */*
x-dev-key: yyyyyyyyyyyyyyyy

Content-Type: application/json;charset=UTF-8

{
    "userId": "E8BDF659B007ADA2C4841EA364E8A70308000000",
    "variables": [
        {
            "type": "name",
            "key": "name_variable",
            "value": "0"
        },
        {
            "type": "data",
            "key": "data_variable",
            "value": "1"
        },
        ïijŽ
        }
    ]
}
```

3.2.2 ãČńãĆźãČİãČşãĆź

ãČĞãČŘãČČãĆřAPIãČłãĆŕãĆĺãĆźãČĹãĄńåŕ¿ãĄŹãĆŃãČIJãČĞãĆčãĄŕJSONå¡ćåijŔãĄğãĄŹãĂĆ
ãČĞãČŘãČČãĆřAPIãČłãĆŕãĆĺãĆźãČĹãĄńåŕ¿ãĄŹãĆŃãČńãĆźãČİãČşãĆźãČşãČijãČL'ãĄőäÿĂèęğãĄŕäžěäÿŃãĄőãĄĺãĄŁãĆŁãĄğ
åŕ¿èl'śãĆĺãČşãĆÿãČşåĘĚãĄőåĞęçŘĘäžěåd'ŰãĄńètůåŽãăĄŹãĆŃãČńãĆźãČİãČşãĆźãČşãČijãČL'(äžěäÿŃäÿĂèęğäžěåd'ŰãĄőHTT
ãĄİãĄőåăt'åŘĹãĄőãČńãĆźãČİãČşãĆźãČIJãČĞãĆčãĄőåĘĚåőźãĄŕäÿ■åőŽãĄğãĄŹãĂĆ

ãĄłãĄŁãĂĄéĂĄä£ąæŹĆãĄńãĂĄåd'L'æŢřãČłãĆźãČĹïijŽvariablesãĆŠæŇĞåőŽãĄŮãĄ§åăt'åŘĹãĂĄåŘŮä£ąãČĞãČijãĆ£ãĄńãĄŕ

- ãČńãĆźãČİãČşãĆźãČşãČijãČL'

ãĆşãČijãČL'	èłňæŸŐ
200	ãČłãĆŕãĆĺãĆźãČĹæ■čåÿÿçţĆäžĘãĂĆ
400	ãČŠãČl'ãČąãČijãĆ£ãĆĺãČl'ãČijãĂĆãČłãĆŕãĆĺãĆźãČĹãĄőåĘĚåőźãĄőèęŃçŻt'ãĄŮãĄŇå£ĚèęĄãĄğãĄŹãĂ

- ãČňãĆźãČİãČşãĆźãČŸãČČãČĂ

ãČŢãĆčãČijãČńãČĽåŘ■		èłňæŸŐ
Content-Type	application/json;charset=UTF-8	ãĆşãČşãČĘãČşãČĹãĆ£ãĆđ'ãČŮãĄğJSONãĂĄæŰ

- ãČňãĆźãČİãČşãĆźãČIJãČĞãĆč

éăĚçŽőåŘ■	ãĆ■ãČij	åđŃ	å£ĚéăĹ	èłňæŸŐ
åŕ¿èl'śåśĕæ■t'æČĚåăś	conversations	json	Yes	æŇĞåőŽãĄŮãĄ§ãČęãČijãĆűãĄőåŕ¿èl'śåśĕæ■t'ãĆŠåŔŰå¿Ůã
çŻt'è£Śåŕ¿èl'śæČĚåăś	current_conversations	json	Yes	çŻt'è£ŚãĄőåŕ¿èl'śåĞęçŘĘãĄğãĄőåđ'L'æŢřåĘĚåőźãĄőåđ'L'æ
ãĆůãČŁãČłãĆłãĆĺãČĺ'ãĆ¤ijæČĚåăś	categories	json	Yes	åŕ¿èl'śãĆůãČŁãČłãĆłçŻźéÑšæŹĆãĄőãĆĺãČĺ'ãČijåĘĚåőźãĆŠ
ãĆůãČŁãČłãĆłéĞ■èđ'ĞãĆĚåăś	patterns	json	Yes	åŕ¿èl'śãĆůãČŁãČłãĆłçŻźéÑšæŹĆãĄőpatternãĄőéĞ■èđ'ĞãĆŠ
èl■åőŽãČŢãĆąãĆđ'ãČńãĄőãĆĺãČĺ'ãĆijæČĚåăś	topics	json	Yes	åŘĎçĺőèĺ■åőŽãČŢãĆąãĆđ'ãČńãĄőçŻźéÑšæŹĆãĄőãĆĺãČl'ãČ
ãČ■ãĆřæČĚåăś	logs	json	Yes	çŻt'è£ŚãĄőåŕ¿èl'śåĞęçŘĘãĄőäÿ■ãĄğãĂĄtemplateãĆ£ãĆřåĘ

- ãČňãĆźãČİãČşãĆźä¿Ń

```
HTTP/1.1 200 Ok
Content-Type: application/json;charset=UTF-8

{
    "conversations": {
        "categories": 1251,                         /*␣
↪çŹźéÑšãĄŢãĆÑãĄęãĄĎãĆŃCategoryæŢř */
        "user_categories": 0,                       /*␣
↪learnfãĄğçŹźéÑšãĄŢãĆÑãĄ§ãČęãČijãĆűåŽžæIJL'ãĄőCategoryæŢř */
        "exception": null,                          /*␣
↪ä¿Ńåd'ŰçŹžçŢ§æŹĆãĄőãČąãČČãĆżãČijãĆÿ */
        "client_context": {                         /*␣
↪ãĆŕãČl'ãĆd'ãĆćãČşãČĹãČżãČęãČijãĆűæČĚåăś */
            "botid": "bot",
            "brainid": "brain",
            "clientid": "yadlan",
            "depth": 0,
            "userid": "E8BDF659B007ADA2C4841EA364E8A70308E03A71"
        },
        "properties": {                             /*␣
↪çŔ¿åIJĺãĄőãĆřãČ■ãČijãČŘãČńåd'L'æŢřïijĹnameïijL'åĂd'ãČłãĆźãČĹ */
            "topic": "daytime",
            "name_variable": "0"
        },
        "data_properties": {                        /*␣
↪çŔ¿åIJĺãĄőãĆřãČ■ãČijãČŘãČńåd'L'æŢřïijĹdataïijL'åĂd'ãČłãĆźãČĹ */
            "data_variable": "1"
        },
        "max_histories": 100,                       /*␣
↪æIJĂåd'ğåŕ¿èl'śåśĕæ■t'çőąçŘĘæŢřïijL' */
        "questions": [                              /*␣
↪åŕ¿èl'śåśĕæ■t'ïijĹåŔd'ãĄĎãĆĆãĄőãĄŃãĆL'éăĘãĄńãĂĄmax_historiesåĹĘãĆŠæăijçt'■ïijL' */
            {
                "exception": null,
                "name_properties": {                /*␣
↪åĞęçŘĘåőÑäžĘæŹĆãĄőãĆřãČ■ãČijãČŘãČńåd'L'æŢřïijĹnameïijL'åĂd'ãČłãĆźãČĹ */
                    "topic": "daytime"
                },
                "data_properties": {},              /*␣
↪åĞęçŘĘåőÑäžĘæŹĆãĄőãĆřãČ■ãČijãČŘãČńåd'L'æŢřïijĹdataïijL'åĂd'ãČłãĆźãČĹ */
                "var_properties": {                 /*␣
↪åĞęçŘĘåőÑäžĘæŹĆãĄőãČ■ãČijãĆńãČńåd'L'æŢřïijĹvarïijL'åĂd'ãČłãĆźãČĹ */
                    "__USER_LOCALE__": "None",
```

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```
                    "__USER_METADATA__": "None"
                    :
                },
               "sentences": [                          /*␣
↪çŹžèl'śæŰĞærŐãĄőåĞęçŘĘæČĚåăś */
                    {
                        "question": "test",             /* çŹžèl'śæŰĞ */
                        "matched_node": {               /*␣
↪ãČđãČČãČĄãĄŮãĄ§ãĆůãČŁãČłãĆłæČĚåăś */
                            "file_name": "../storage/categories/basic.aiml",
                            "start_line": "78",
                            "end_line": "92"
                        },
                        "response": "response OK"       /* å£IJç■ŤæŰĞ */
                    }
                :
            :
        ]
    },
    "current_conversation": [
        {
            "before_variables": {                   /*␣
↪åd'L'æŻt'ãĄÑãĄĆãĄčãĄ§åd'L'æŢřãĄőåĞęçŘĘéŰŃåğŃæŹĆãĄőåĂd'ãČłãĆźãČĹ */
                "name_properties": {
                    "topic": "*",
                    "name_variable": null
                },
                "data_properties": {
                    "data_variable": null
                }
            },
            "after_variables": {                    /*␣
↪åd'L'æŻt'ãĄÑãĄĆãĄčãĄ§åd'L'æŢřãĄőåĞęçŘĘåőÑäžĘæŹĆãĄőåĂd'ãČłãĆźãČĹ */
                "name_properties": {
                    "topic": "daytime",
                    "name_variable": "0"
                },
                "data_properties": {
                    "data_variable": "1"
                }
            },
            "question": "test",                     /* çŹžèl'śæŰĞ */
            "that": "*",                            /*␣
↪ãČđãČČãČĄåŕ¿èśąãĄĺãĄłãĆŃçŻt'è£ŚãĄőå£IJç■ŤæŰĞ(åĹİæIJ§åĂd'ïijž"*") */
            "topic": "*"                            /*␣
↪ãČđãČČãČĄåŕ¿èśąãĄĺãĄłãĆŃçŕ¿åIJĺãĄőTopicåĂd' */
            "matched_node": {                       /*␣
↪ãČđãČČãČĄãĄŮãĄ§ãĆůãČŁãČłãĆłæČĚåăś */
                "file_name": "../storage/categories/basic.aiml",
                "start_line": "78",
                "end_line": "92"
            },
            "processing_result": "response OK",  /*␣
↪brainãĄőéĂŽåÿÿåĞęçŘĘãĄğçŢ§æĹŘãĄŢãĆŃãĄ§å£IJç■ŤæŰĞïijĹdenied_
↪sraiåő§æŰ¡æŹĆãĄńãĄŕçl'žæŰĞå■ŮïijL' */
            "response": "response OK"               /* å£IJç■ŤæŰĞ */
            "srai_histories": [                     /* sraiåĞęçŘĘãĄőåő§æŰ¡åśěæ■t' */
                {
                    "before_variables": {               /*␣
↪åd'L'æŻt'ãĄÑãĄĆãĄčãĄ§åd'L'æŢřãĄősraiåĞęçŘĘéŰŃåğŃæŹĆãĄőåĂd'ãČłãĆźãČĹ */
                        "name_properties": {
```


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```
                            "topic": "*"
                        },
                        "var_properties": {
                            "var_variable": null
                        }
                    },
                    "after_variables": {            /*␣
↪åd'L'æŻt'ãĄÑãĄĆãĄčãĄŞåd'L'æŢřãĄősraiåĞęçŘĘåőÑäžĘæŹĆãĄőãČłãĆźãČĹ */
                        "name_properties": {
                            "topic": "daytime"
                        },
                        "var_properties": {
                            "var_variable": "srai_var"
                        }
                    },
                    "question": "test srai",         /* sraiåŕ¿èśąãĄőçŹžèl'śæŰĞ */
                    "that": "*",
                    "topic": "*",
                    "matched_node": {
                        "file_name": "../storage/categories/basic.aiml",
                        "start_line": "4",
                        "end_line": "11"
                    },
                    "processing_result": "srai OK",
                    "response": "srai OK"
                }
            ]
        }
    ],
    "errors": [
        {                                           /*␣
↪ãĆůãČŁãČłãĆłåĘĚãĄőäÿ■æ■čæČĚåäśãĆŠãČŢãĆąãĆd'ãČńãČżCategoryå■Ÿä¡■ãĄğåĞžåŁŻ */
            "category": {
                "end": "None",
                "start": "None"
            },
            "description": "Failed to load contents of AIML file : XML-Parser␣
↪Exception [mismatched tag: line 238, column 25]",
            "file": "../storage/categories/ng.aiml",
            "node": {
                "column": "0",
                "raw": "0"
            },
            "node_name": null
        }
    ],
    "duplicates": [
        {                                           /*␣
↪ãĆůãČŁãČłãĆłåĘĚãĄğãĄőéĞ■èd'ĞCategoryãĄőæČĚåäśãĆŠåĞžåŁŻ */
            "category": {
                "end": "35",
                "start": "21"
            },
            "description": "Dupicate grammar tree found [ãĄŁãĄŕãĆĹãĄĘ]",
            "file": "../storage/categories/basic.aiml",
            "node": {
                "column": "9",
                "raw": "22"
            }
        }
    ],
```


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```
    "errors_collection": {
        "denormals": [                          /* denormal.
↪txtãĄőäÿ■æ■čæČĚåăśãĆŠåĞžåŁŻ */
            {
                "description": "illegal format [\"word\"]",
                "file": "../storage/lookups/denormal.txt",
                "line": 1
            }
        ],
        "normals": [],                          /* normal.
↪txtãĄőäÿ■æ■čæČĚåăśãĆŠåĞžåŁŻ */
        "genders": [],                          /* gender.
↪txtãĄőäÿ■æ■čæČĚåăśãĆŠåĞžåŁŻ */
        :
    },
    "logs": [
        {
            "info": "(templete log-node) log message"
        }
    ]
}
```

errors/duplicates/errors_collectionãĄőåĘĚåőźãĆŠåŔĆçĚğãĄŹãĆŃãĄŞãĄĺãĄğãĂąãĆůãČŁãČłãĆłãĆĎåŘĎçĺõèĺ■åőŽãČŢãĆąãĆd'

conversations/current_conversation/logsãĄőåĘĚåőźãĄŃãĆL'ãĄŕåŕ¿èl'śåĞęçŘĘãĄőçŁűæşĄãĄŃçćžèł■ãĄğãĄ■ãĄ¿ãĄŹãĂĆïijĹä¿Ń

conversationsãĄğãĄŕãĂąä¡£çŤĺãĄŢãĆŃãĄęãĄĐãĆŃåĚĺåd'L'æŢřãĄőæČĚåăśãĄŃåĞžåŁŻãĄŢãĆŃãĄ¿ãĄŹãĄŃãĂącurrent_conv
ãČňãĆźãČİãČşãĆźä¿ŃãĄőcurrent_conversationãĄŃãĆL'ãĄŕãĂąçŹžèl'śæŰĞ âĂIJtestâĂİ
ãĄńåŕ¿ãĄŮãĄęãĂąâĂİtest sraiâĂİ
ãĄńåŕ¿ãĄŹãĆŃsraiåĞęçŘĘãĄŃåő§æŰ¡ãĄŢãĆŃãĂąsraiåĞęçŘĘãĄőäÿ■ãĄgtopicåd'L'æŢřãĄŃåd'L'æŻt'ãĄŢãĆŃãĄ§ãĄŞãĄĺãĄŃ

3.2.3 ãČęãČijãĆűåŻžæIJL'æČĚåăśãĄőãĆŕãČłãĆćæŇĞåőŽ

ãČĞãČŘãČČãĆřAPIãĄőãČłãĆŕãĆĺãĆźãČĹãĄńãĄŕãĂąãČęãČijãĆűæŕŐãĄńä£İæŇąãĄŹãĆŃåŻžæIJL'æČĚåăśãĆŠãĆŕãČłãĆćãĄŹ

æIJňæŇĞåőŽãĆŠèąŇãĄčãĄ§ååt'åŘĹãĄńãĄŕãĂąäżŰãĄőæŇĞåőŽãĆĹãĆŁãĆĆåĎłåĚĹãĄŢãĆŃãĆŃçĆžãĂąãČňãĆźãČİãČşãĆźã
ãĆŕãČłãĆćåĞęçŘĘãĆŠèąŇãĄĘåŕ¿èśąãĄŕãĂąäżěäÿŃãĄőïijŠçĺőéąđãĄğãĄŹãĂĆ

- åŕ¿èl'śåśěæ■t'ïijĹconversation æŇĞåőŽïijL'ïijŽ ãČęãČijãĆűæŕŐãĄőåŕ¿èl'śåśěæ■t'æČĚåăśãĆŠãĆŕãČłãĆćãĄŮãĄ¿ãĄŹã
- learnçŹżéŇšæČĚåăśïijĹlearn æŇĞåőŽïijL'ïijŽ TemplateãĄő *learnf* ãĆŐãČijãČL'ãĄğçŹżéŇšãĄŢãĆŃãĄ§ãĂąãČęãČijãĆűåŽžæIJL'ãĄőCategoryæČĚåăśãĆŠãĆŕãČłãĆćãĄŮãĄ¿ãĄŹãĂĆ
- ãČłãĆŕãĆĺãĆźãČĹãČIJãČĞãĆč

éăĚçŻőåŘ■	ãĆ■ãČij	åđŃ	å£ĚéăĹ	èłňæŸŐ
ãČęãČijãĆűID	userId	string	Yes	ãČęãČijãĆűæŕŐãĄőãČęãČŃãČijãĆŕãĄłIDãĆŠæŇĞåőŽãĄŮã
ãĆŕãČłãĆćåŕ¿èśą	reset	string	Yes	âĂŸconversationâĂŹãĂąâĂŹlearnâĂŹ ãĄőãĄĐãĄŽãĆŃãĄŃãĂąãĄ¿ãĄ§ãĄŕãĂąäÿąæŰźãĆŠæĐŔå âĂŸallâĂŹ ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ

- ãČłãĆŕãĆĺãĆźãČĹä¿Ń

```
POST / HTTP/1.1
Host: www.***.com
Accept: */*
x-dev-key: yyyyyyyyyyyyyyyyy

Content-Type: application/json;charset=UTF-8

{
    "userId": "E8BDF659B007ADA2C4841EA364E8A70308000000",
    "reset": "all"
}
```

- ãČňãĆźãČİãČşãĆźãČIJãČĞãĆč

äżěäÿŃãĄőãĄľãĄąãĆĽãĄŃãĄőJSONå¡ćåijŔãĄŇèĺ■åőŽãĄŢãĆŇãĄ¿ãĄŹãĂĆ

- æĹŘåŁ§æŹĆïijŽ {âĂIJresetâĂİ: âĂIJSucceededâĂİ}
- åď śæŢŮæŹĆïijŽ {âĂIJresetâĂİ: âĂIJFailedâĂİ}
- ãČňãĆźãČİãČşãĆźä¿Ń

```
HTTP/1.1 200 Ok
Content-Type: application/json;charset=UTF-8

{
    "reset": "Succeeded"
}
```

CHAPTER 4

COTOBA AIML: å§žæIJňèęĄçťă

ãĄŞãĄőçńăăĄğãĄŕãĂĄCOTOBA AIML (cAIML) ãĄğãĆţãČİãČijãČĹãĄŮãĄęãĄĐãĆŃAIM-
LãĄőå§žæIJňãĄĺãĄłãĆŃèęĄçť ăăĄńãĄd' ãĄĐãĄęèłňæŸŐãĄŮãĄ¿ãĄŹãĂĆ

ãĆżãĆŕãĆůãČğãČşåĘŠéă■ãĄő[âĂę]ãĄŕãĂĄãĄİãĄőèęĄçť ăăĄŇæIJĂåĹİãĄńåőŽç¿l' ãĄŢãĆŇãĄ§AIMLãĄőãČŘãČijãĆÿãČğãČşãĆ
[custom]ãĄŕãĂĄcAIML çŃňèĞłäżŢæğŸæŃąåijţãĄőèęĄçť ăăĄğãĄŹãĂĆ

cAIMLãĄőãČŚãĆ£ãČijãČşãČđãČČãČĄãČşãĆŕåĎłåĚĹéăĘä¡■ãČńãČijãČńãĄőèl' şçť řãĄńãĄd' ãĄĐãĄęãĄŕãĂŇ*ãČŚãĆ£ãČijãČşãĆ*

- *aiml*
- *category*
- *pattern*
- *template*
- *topic*

4.1 aiml

[1.0]

aimlèęĄçť ăăĄŕãĂĄcAIMLãĄőãČńãČijãČĹèęĄçť ăăĄğãĄŹãĂĆäżŰãĄőåĚĺãĄęãĄőcAIMLãĄőèęĄçť ăăĄŕaimlèęĄçť ăăĄőåĘĚåőź

- åśđæĂğ

ãČŚãĆ£ãČąãČijãĆ£ãĆ£ãĆđ'ãČŮ		å£ĔéăĺňæŸŐ	
version	string	Yes	èlŸè£řãĄŢãĆŇãĄęãĄĐãĆŃAIMLãĄőãČŘãČijãĆÿãČğãČşãĆŠæŇĞåőŽãĄŮã

- ä¡£çŤĺä¿Ń

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <!-- cAIML element should be described here -->
</aiml>
```

4.2 category

[1.0]

categoryèęĄçţ’ăăĄŕãĂĄcAIMLãĄőåŕ¿èľśãČńãČijãČńãĄőå§žæIJňå■Ÿä¡■ãĄńçŻÿå¡ŞãĄŮãĄ¿ãĄŹãĂĆ

categoryèęĄçţ’ăăĄőåĘĚåőźãĄĺãĄŮãĄęãĂĄãČęãČijãĆűãĄőçŹžèľśæŰĞãĄĺãĄőãČđăČČãČĄãČşãĆřãČŚãĆ£ãČijãČşãĆŚæŇĞåőŽ
pattern èęĄçţ’ăăĄĺãĆůãĆźãČĘãČăăĄőå£IJç■ŤæŰĞãĆŚæŇĞåőŽăĄŹãĆŃ *template*
èęĄçţ’ăăĆŚèĺŸè£řãĄŮãĄę1ãĄd’ăĄőåŕ¿èľśãČńãČijãČńãĆŚægŃæĹŘãĄŮãĄ¿ãĄŹãĂĆ

aimlèęĄçţ’ăăĄőåĘĚåőźãĄńãĂĄèd’ĞæŢřãĄőcategoryèęĄçţ’ăăĄőãČŰãČ■ãČČãĆřãĆŚåŘńãĆŞãĄăå¡ćãĄğèĺŸè£řãĄŹãĆŃãĄŞãĄĺã
aiml èęĄçţ’ăăĄĺ *topic* èęĄçţ’ăăĆŚéŹd’ãĄŔãĂĄãĄŹãĄźãĄęãĄőcAIMLãĄőèęĄçţ’ăăĄŕãĂĄcatego-
ryèęĄçţ’ăăĄőãČŰãČ■ãČČãĆŕåĘĚãĄńåŘńãĄ¿ãĆŇãĄęãĄĎãĆŃå£ÈèęĄãĄŇãĄĆãĆŁãĄ¿ãĄŹãĂĆ

åřŽãĂĄçŹżéŇšåŔŕèČ¡ãĄłcategoryæŢřãĄŕãĂĄãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşåőŽç¿l’ãĄő
åĹűéŹŘåĂd’åőŽç¿l’ ãĄő `max_categories` ãĄ¿ãĄğãĄĺãĄłãĆŁãĄ¿ãĄŹãĂĆ

- åśđæĂğ

ãĄłãĄŮ

- ä¡£çŤĺä¿Ń

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ</pattern>
        <template>äżŁæŮěãĆĆãĄĎãĄĎåd’l’ærŮãĄğãĄŹãĄ■</template>
    </category>
        <category>
            <pattern>ãĄŢãĆĹãĄĘãĄłãĆL’</pattern>
            <template>æŸŐæŮěãĄ¿ãĄ§äijŽãĄĎãĄ¿ãĄŮãĆĞãĄĘ</template>
        </category>
</aiml>
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕ
Output: äżŁæŮěãĆĆãĄĎãĄĎåd’l’ærŮãĄğãĄŹãĄ■
Input: ãĄŢãĆĹãĄĘãĄłãĆL’
Output: æŸŐæŮěãĄ¿ãĄ§äijŽãĄĎãĄ¿ãĄŮãĆĞãĄĘ

éŰćéĂčéăĚçŻő: *aiml*, *topic* , *pattern*, *template*

4.3 pattern

[1.0]

patternèęÀçţ'ăăĄŕăĂĄcategoryèęÀçţ'ăăĄőåĘĚåőźăĄĺãĄŮăĄęèÍŸè£řăĄŮăĂĄpatternèęÀçţ'ăăĄőåĘĚåőźăĄĺãĄŮăĄęãČęãČijãĆűãĄ

patternèęÀçţ'ăåĘĚãĄńèÍŸè£řăĄŢãĆŇãĄ§æŰĞå■ŮåĹŮãĄĺãČęãČijãĆűçŹžèl'śæŰĞãĄőæŰĞå■ŮåĹŮãĄŇäÿÄèĞt'ãĄŮãĄ§åät'åŘĺ

- åśđæĂğ

ãĄłãĄŮ

- ä¡£çŤĺä¿Ń

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ</pattern>
        <template>äżŁæŮěãĆĆãĄĎãĄĎåd'l'ærŮãĄğãĄŹãĄ■ãĂĆ</template>
    </category>
</aiml>
```

patternèęÀçţ'ăăĄőåĘĚåőźãĄńãĄŕæŰĞå■ŮåĹŮäžěåd'ŰãĄőcAIMLèęÀçţ'ăăĆŠåŘńãĆĂèÍŸè£řãĆŠèąŇãĄĘãĄŞãĄĺãĆĆãĄğãĄ■ãĄ

ãĄİãĆŇãĄńãĆĹãĆŁãĂĄèd'ĞéŻŠãĄłãČŠãĆ£ãČijãČşãČđãČČãČĄåĞęçŘĘãĆŠèąŇãĄĘãĄŞãĄĺãĄŇãĄğãĄ■ãĄ¿ãĄŹãĂĆ

patternèęÀçţ'ăăĄőåĘĚåőźãĄĺãĄŮãĄęèÍŸè£řåŔŕèČ¡ãĄłcAIMLèęÀçţ'ăăĄőèl'şçţ'řãĄńãĄd'ãĄĎãĄęãĄŕãĂĄ*patternèęÀçţ'ă*
ãĆŠå¿ąèęğãĄŘãĄăăĄŢãĄĎãĂĆ

4.4 template

[1.0]

templateèęÀçţ'ăăĄŕãĂĄcategoryèęÀçţ'ăăĄőåĘĚåőźãĄĺãĄŮãĄęèÍŸè£řãĄŮãĂĄtemplateèęÀçţ'ăăĄőåĘĚåőźãĄĺãĄŮãĄęãĆůãĆźãČ

åŕ¿èl'śãČńãČijãČń(categoryèęÀçţ'ăăĄőãČŰãČ■ãĆČãĆŕ)ãĄŇåő§èąŇãĄŢãĆŇãĄ§åät'åŘĹãĂĄå¡Şèl'šcategoryèęÀçţ'ăăĄőãČŰãČ■ã

- åśđæĂğ

ãĄłãĄŮ

- ä¡£çŤĺä¿Ń

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ</pattern>
        <template>äżŁæŮěãĆĆãĄĎãĄĎåd'l'ærŮãĄğãĄŹãĄ■ãĂĆ</template>
    </category>
</aiml>
```

templateèęÀçţ'ăăĄőåĘĚåőźãĄńãĄŕæŰĞå■ŮåĹŮäžěåd'ŰãĄőcAIMLãĆ£ãĆřãĆŠåŘńãĆĂèÍŸè£řãĆŠèąŇãĄĘãĄŞãĄĺãĄŇãĄğãĄ■ã

ãĄİãĆŇãĄńãĆĹãĆŁãĂĄèd'ĞéŻŠãĄłå£IJç■ŤæŰĞçŤ§æĹŘåĞęçŘĘãĆŠèąŇãĄĘãĄŞãĄĺãĄŇãĄğãĄ■ãĄ¿ãĄŹãĂĆ

templateèęAçt’ăăĄőåĘĚåőźãĄńèÍŸè£řåŔŕèČ¡ãĄłcAIMLèęAçt’ăăĄőèl’şçt’řãĄńãĄd’ãĄĎãĄęãĄŕãĂĄ*templateèęAçt’ă*
ãĆŠå¿ąèęğãĄŔãĄăăĄŢãĄĎãĂĆ

4.5 topic

[1.0]

topicèęAçt’ăăĄőãČŰãČ■ãČČãĆŕåĘĚãĄńãĂĄèd’ĞæŢřãĄőåŕ¿èl’śãČńãČijãČń *category*
èęAçt’ăăĆŠèÍŸè£řãĄŹãĆŃãĄŞãĄÍãĄğåŕ¿èl’śãČńãČijãČńãĆŠãĆşãČęãĆ■ãĆźãČĹåŇŰãĄŹãĆŃãĄŞãĄÍãĄŇãĄğãĄ■ãĄ¿ãĄŹã

åŕ¿èl’śãČńãČijãČńãĄŇãĆşãČşãČĘãĆ■ãĆźãČĹåŇŰãĄŢãĆŇãĆŃãĄÍãĂĄåŕ¿èl’śãĆÍãČşãĆÿãČşãĄŇä£ÍæŇĄãĄŹãĆŃåd’L’æŢř
topic ãĄőåĂd’ãĄŇãĂĄtopicèęAçt’ăăĄő-
nameåśđæĂğãĄğæŇĞåőŽãĄŮãĄ§åśđæĂğåĂd’ãĄÍäÿĂèĞt’ãĄŹãĆŃæŹĆãĄăãĄŞãĂĄåŕ¿èl’śãČńãČijãČńãĄŇèl’Ţä¿ąãĄŢãĆŇãĄ¿ã

topicèęAçt’ăăĄőãČŰãČ■ãČČãĆŕåĘĚãĄńåŘńãĄ¿ãĆŇãĄłãĄĎåŕ¿èl’śãČńãČijãČń(ãĆşãČşãČĘãĆ■ãĆźãČĹåŇŰãĄŢãĆŇãĄłãĄĎåŕ¿ã
category èęAçt’ăăĄŕãĂĄ-
nameåśđæĂğãĄőåśđæĂğåĂd’ãĄŇãČŕãĆd’ãČńãČL’ãĆńãČijãČL’âĂİ*âĂİãĄÍæŇĞåőŽãĄŢãĆŇãĄęãĄĎãĆŇãĄőãĄÍåŘŇãĄŸæL’śã
topic ãĄőåĂd’ãĄńéŰćä£ĆãĄłãĄŔãĄİãĄőåŕ¿èl’śãČńãČijãČńãĄŕèl’Ţä¿ąãĄŢãĆŇãĄ¿ãĄŹãĂĆ

ãĄ§ãĄăăĄŮãĂĄtopicèęAçt’ăăĄğãĆşãČşãČĘãĆ■ãĆźãČĹåŇŰãĄŢãĆŇãĄ§åŕ¿èl’śãČńãČijãČńãĄŇåĎłåĚĹãĄŮãĄęèl’Ţä¿ąãĄŢãĆŇ

âĂIJtopicâĂİãĄŕäžĹçt’Ďèłđ㥹ãĄÍãĄłãĆŇãĄ§ãĆĄãČęãČijãĆűãĄŇåőŽç¿l’ãĄŹãĆŃåd’L’æŢřåŘ■ãĄÍãĄŮãĄęãĄŕåĹl’çŤÍãĄğãĄ■ãĄ¿ã

- åśđæĂğ

ãČŚãČľãČąãČijãĆ£ãĆ£ãĆđ’ãČŮ		å£Ëéăĺñæ ŸŐ	
name	string	Yes	topicåŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ

topicèęAçt’ăăĆŠåĹl’çŤÍãĄŹãĆŃãĄÍãĂĄäżěäÿŇãĄőä¡£çŤÍä¿ŇãĄőãĆĹãĄĘãĄńåŘŇãĄŸ *pattern*
ãĄőãČđãČČãČĄãČşãĆŕåŃŢä¡IJãĆŠãĆşãČşãČĘãĆ■ãĆźãČĹ(topicãĄőåĂd’)ãĄńå£IJãĄŸãĄęä¡£ãĄĎåĹĘãĄŚãĆŃãĄŞãĄÍãĄŇãĄğ

ãĄŞãĄőä¡£çŤÍä¿ŇãĄğãĄŕãĂĄãČęãČijãĆűãĄőãĂŇçğĄãĄŕä¡ŢãĆĆåĚěãĆŇãĄ¿ãĄŻãĆŞãĂ■ãĄÍãĄĎãĄĘçŹžèl’śãĄńåŕ¿ãĄŮãĄęã

- ä¡£çŤÍä¿Ń

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern>*ãĄńãĄd’ãĄĎãĄęèl’śãĄŮãĄ¿ãĄŮãĆĞãĄĘ</pattern>
        <template>
            çğĄãĆĆ<set name="topic"><star /></set>ãĄŇåě¡ãĄ■ãĄğãĄŹãĂĆ
        </template>
    </category>

    <topic name="ãĆşãČijãČŠãČij">
        <category>
            <pattern>çğĄãĄŕä¡ŢãĆĆåĚěãĆŇãĄ¿ãĄŻãĆŞ</pattern>
            <template>çğĄãĄŕãĆŕãČłãČijãČăãĄÍçăĆçşŮãĆŠåĚěãĆŇãĄ¿ãĄŹ</template>
        </category>
    </topic>

    <topic name="çt’ĚèŇű">
```

(continues on next page)

(continued from previous page)

```
        <category>
            <pattern>çğĄãĄŕä¡ŢãĆĆåĚěãĆŇãĄ¿ãĄŻãĆŞ</pattern>
            <template>çğĄãĄŕãČňãČćãČşãČĘãĆčãČijãĄŇåě¡ãĄ■ãĄğãĄŹ</template>
        </category>
    </topic>
</aiml>
```

Input: ãĆşãČijãČŠãČijãĄńãĄd'ãĄĎãĄęèl'śãĄŮãĄ¿ãĄŮãĆĞãĄĘ
Output: çğĄãĆĆãĆşãČijãČŠãČijãĄŇåě¡ãĄ■ãĄğãĄŹ
Input: çğĄãĄŕä¡ŢãĆĆåĚěãĆŇãĄ¿ãĄŻãĆŞ
Output: çğĄãĄŕãĆŕãČłãČijãČăãĄÍçăĆçşŰãĆŠåĚěãĆŇãĄ¿ãĄŹ
Input: çť ĚèŇűãĄńãĄd'ãĄĎãĄęèl'śãĄŮãĄ¿ãĄŮãĆĞãĄĘ
Output: çğĄãĆĆçť ĚèŇűãĄŇåě¡ãĄ■ãĄğãĄŹ
Input: çğĄãĄŕä¡ŢãĆĆåĚěãĆŇãĄ¿ãĄŻãĆŞ
Output: çğĄãĄŕãČňãČćãČşãČĘãĆčãČijãĄŇåě¡ãĄ■ãĄğãĄŹ

éŰćéĂčéăĚçŻő: *that*, *set*, *think*

CHAPTER 5

patternèęAçťăåĘĚãĄőå■ŘèęAçťă

æIJňçńăăAğãAŕpatternèęAçťăăAőåĘĚåőźãAĺãAŲãAęèÍŸè£řåŔŕèČ¡ãAłå■ŘèęAçťăăAńãAd'ãAĎãAęèłňæŸŐãAŲãA¿ãAŹãĂĆ

å■ŘèęAçťăăAőä¡£çŤÍåŔŕåŘęãAńãAd'ãAĎãAęãAŕãĂAąãĆńãĆźãĆ£ãČđãĆd'ãĆžãAŇåŔŕèČ¡ãAğãAŹãĂĆèľşçť'řãAŕ
ãĆńãĆźãĆ£ãČăpatternèęAçť'ă ãĆŠåŔĆçĚğãAŲãAęãAŔãAąăăAŢãAĎãĂĆ

cAIMLãAğãĆţãČİãČijãČĹãAŲãAęãAĎãĆŃãČŚãĆ£ãČijãČşãČđãČČãČąãČşãĆřèęAçťăăAőäÿĂèęğãAŕäžëäÿŃãAőãAĺãAŁãĆŁãA
åĚňåijŔãAő AIML
2.xäžŢæğŸãAńåŕ¿ãAŲãĂAçŃňèĞłãAőèęAçťăăĆżãČČãČĹãĆŠè£¡åŁăăAŲãAęãAĎãA¿ãAŹãĂĆ

- *bot*: ãČđãČČãČąãAŢãAŻãĆŃãČIJãČČãČĹãAőæČĚåăśãĆŠæŇĞåőŽ
- *iset*: ãČđãČČãČąãAŢãAŻãĆŃå■ŸèłđãAőéŻĘåŘĹãĆŠæŇĞåőŽ
- *nlu*: ãČđãČČãČąãAŢãAŻãĆŃéńŸåžęæĎŔåŻşèğčéĞĹçţŘæđIJãĆŠæŇĞåőŽ
- *oneormore*: 1åĂŃäżëäÿŁãAőäżżæĎŔãAőå■ŸèłđãAĺãČđãČČãČąãAŹãĆŃãČŕãĆd'ãČńãČL'ãĆńãČijãČL'
- *priority*: ãČŕãĆd'ãČńãČL'ãĆńãČijãČL'ãĆĹãĆŁãĆĆåĎłåĚĹãAŲãAęãČđãČČãČąãAŹãĆŃå■ŸèłđãĆŠæŇĞåőŽ
- *regex*: ãČđãČČãČąãAŢãAŻãĆŃæ■čèęŔèąĺçŔ¿ãĆŠæŇĞåőŽ
- *set*: ãČđãČČãČąãAŢãAŻãĆŃå■ŸèłđãAőéŻĘåŘĹãĆŠèÍŸè£řãAŲãA§ãČŢãĆąãĆd'ãČńãĆŠæŇĞåőŽ
- *topic*: ãČđãČČãČąãAőæİąäżűãAńè£¡åŁăăAŹãĆŃtopicåd'L'æŢřãAőåĂd'ãĆŠæŇĞåőŽ
- *that*: 1ãAd'åL'■ãAőãĆůãĆźãČĘãČăăAőå£IJç■ŤæŰĞãĆŠæŇĞåőŽ
- *word*: ãČđãČČãČąãAŢãAŻãĆŃå■ŸèłđæŰĞå■ŮåĹŮ)ãĆŠæŇĞåőŽ
- *zeroormore*: 0åĂŃäżëäÿŁãAőäżżæĎŔãAőå■ŸèłđãAĺãČđãČČãČąãAŹãĆŃãČŕãĆd'ãČńãČL'ãĆńãČijãČL'

ãAŞãAŞãAğèłňæŸŐãAŹãĆŃèęAçťăăAőåd'ğå■ŁãAŕãĂAåśđæĂğãAőæŇĞåőŽãAĺãĂAåĘĚåőźãAĺãAŲãAęãAőå■ŘèęAçťăăAőèÍŸ
patternèęAçťăăAőèÍŸè£řãAńãĆĹãĆŃãČŚãĆ£ãČijãČşãČđãČČãČąæŰźæşŢãAőèľşçť'řãAńãAd'ãAĎãAęãAŕ
ãČŚãĆ£ãČijãČşãČđãČČãČąãČşãĆř ãĆŠåŔĆçĚğãAŲãAęãAŔãAąăăAŢãAĎãĂĆ

åŘĎèęAçť'ăăAǾåËĹéă■ãAǾ[âĂę]ãAŕãĂAåŕ¿èśąãAǾèęAçť'ăăAŅæIJĂåĹİãAńåőŽç¿l'ãAŢãĆÑãA§AIMLãAǾãČŘãČijãĆÿãČğãČşãĆ

åřŽãĂAąãČđãČČãČąãČşãĆřãAŕãĂAąèŃśæŢřèÍŸåŔůãAŕå■ŁèğŠæŰĞå■ŮãĂAąãĆńãĆ£ãĆńãČŁãAŕåËÍèğŠæŰĞå■ŮãAǾçţśäÿĂãĆşãĆ

5.1 bot

[1.0]

botèęAçť'ăăAŕãĂAąãĆńãĆźãĆ£ãČăăČIJãČČãČĹãČŮãČ■ãČŚãČĘãĆčãĆŠåŚijãAşåĞžãAŹãA§ãĆAąãAńä¡£çŤĺãAŢãĆÑãA¿ãAŹãĂĆ
ãAŞãĆÑãĆL'ãAǾåđ'L'æŢřãAńãAŕãĂAąãČIJãČČãČĹãAńãĆćãĆŕãĆżãĆźãAŹãĆÑãAŹãAźãAęãAǾãČęãČijãĆűãAŅãĆćãĆŕãĆżãĆźã
ãĆńãĆźãĆ£ãČăăČIJãČČãČĹãČŮãČ■ãČŚãČĘãĆčãAŕãĂA*propertiesãČŢãĆąãĆđ'ãČń*
ãAğèÍ■åőŽãAŮãA¿ãAŹãĂĆpatternãAǾbotãAğèÍ■åőŽãAŹãĆÑåĂđ'ãAŕå■ŸèłđãAąğãĂAéŰŞãAńçľžçŹ¡ãĆŠæŇĞãAŮãA§èđ'ĞæŢřå

æŇĞåőŽãAŹãĆÑãČŮãČ■ãČŚãČĘãĆčåŘ■ãAŕãĂAåđ'ğæŰĞå■ŮãČżåřŔæŰĞå■ŮãĂAåĚÍèğŠãČżå■ŁèğŠãĆŠåŇžåĹěãAŮãA¿ãAŹã

- åśđæĂğ

ãČŚãČľãČąãČijãĆ£ãĆ£ãĆđ'ãČŮ		å£ËéăĺñæŸÓ	
name	string	Yes	ãČIJãČČãČĹãČŮãČ■ãČŚãČĘãĆčåŘ■ãĆŠæŇĞåőŽãAŮãA¿ãAŹãĂĆ

propertiesãČŢãĆąãĆđ'ãČńãAğåőŽç¿l'ãAŮãAęãAĎãAłãAĎãČŮãČ■ãČŚãČĘãĆčåŘ■ãĆŠnameãAğæŇĞåőŽãAŮãA§åät'åŘĹãĂAąã

- ä¡£çŤĺä¿Ń

äžëäÿŃãAǾä¡£çŤĺä¿ŃãAğãAŕãČIJãČČãČĹãAǾåŘ■çğřãĆŠè£ŤãAŮãA¿ãAŹãĂĆ(propertiesãČŢãĆąãĆđ'ãČń ãAğ
âĂŸname:ãČIJãČČãČĹâĂŹ ãAĺèÍ■åőŽãAŮãAęãAĎãĆÑåL'■æŔŘ)

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern>ãAĆãAłãA§ãAŕ<bot name="name" />ãAğãAŹãAÑïij§</pattern>
        <template>çğĄãAǾåŘ■åL'■ãAŕ<bot name="name" />ãAğãAŹãĂĆ</template>
    </category>
</aiml>
```

Input: ãAĆãAłãA§ãAŕãČIJãČČãČĹãAğãAŹãAÑïij§
Output: çğĄãAǾåŘ■åL'■ãAŕãČIJãČČãČĹãAğãAŹãĂĆ

éŰćéĂčéăĚçŻő: *ãČŢãĆąãĆđ'ãČńçőąçŘĘïijŽproperties*

5.2 iset

[1.0]

isetèęAçť'ăăAŕãĂA*å■ŸèłđãčłãĆźãČĹãČŢãĆąãĆđ'ãČń(sets)*
ãĆŠä¡£çŤĺãAŻãAŽãĂAåřŚæŢřãAǾãČđãČČãČAåŕ¿èśąå■ŸèłđãĆŠèÍŸè£řãAŹãĆÑåät'åŘĹãAńä¡£çŤĺãAŮãA¿ãAŹãĂĆãČđãČČãČA

èęAçt’ăăAĺăAŮăAęăĂAèd’ĞæŢřèŃśå■Ÿèłđă AŅăĆL’ăAłăĆŃæŰĞå■ŮåĹŮăĆĆæŇĞåőŽăAŇåŔřèČ¡ăAğăAŹăAŇăĂAăAİăAőåät’ă

åřŽăĂAèŃśå■Ÿèłđå ĹŮăAĺæŮěæIJňèłđæŰĞå■ŮåĹŮăAŇæůůåIJĺăAŹăĆŃæŇĞåőŽăAőåät’åŘĹăAőåŃŢä¡IJăAŕä£ÌèĺijăAğăA■ăA¿

- åśđæĂğ

ãČŚãČľãČąãČijãĆ£ãĆ£ãĆd’ãČŮ		å£Ëéěĺňæ ŸŐ	
words	string	Yes	ãĆńãČşãČđåŇžåĹĞãĆŁãAğãČđãČČãČAår¿èśąæŰĞå■ŮåĹŮïijĹå■Ÿèłđå ĹŮïi

- ä¡£çŤĺä¿Ń

äžěäÿŇãAőä¡£çŤĺä¿ŃãAğãAŕãĂAąĂŇæİśäžňãĂ■ãĂŇçěđåěĹåůİãĂ■ãĂŇå■ČèŚL’ãĂ■ãĂŇç¿d’éęňãĂ■ãĂŇå§ijçŐL’ãĂ■ãĂŇæăČæ

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern>çğAąãAŕ<iset words="æİśäžň, çěđåěĹåůİ, å■ČèŚL’, ç¿d’éęň, å§ijçŐL’,␣
↪æăČæIJÍ" />ãAńä¡ŔãĆŞãAğãAĎãA¿ãAŹãĂĆ</pattern>
        <template>
            çğAąãĆĆéŰćæİśãAńä¡ŔãĆŞãAğãAĎãA¿ãAŹãĂĆ
        </template>
    </category>
</aiml>
```

Input: çğAąãAŕæİśäžňãAńä¡ŔãĆŞãAğãAĎãA¿ãAŹãĂĆ
Output: çğAąãĆĆéŰćæİśãAńä¡ŔãĆŞãAğãAĎãA¿ãAŹãĂĆ

éŰćéĂčéăĚçŻő: *set*

5.3 nlu

[custom]

nluèęAçt’ăăAŕãĂAéńŸåžęæĎŔåŻşèğčéĞĹãĆĺãČşãĆÿãČşãAńãĆĹãĆŃãČęãČijãĆűçŹžèl’śæŰĞãAőæĎŔåŻşèğčéĞĹçţŘæđIJãĆŠçŤ

åśđæĂğãĂAå■ŘèęAçt’ăăAőèĺ■åőŽæŰźæşŢãĂAéńŸåžęæĎŔåŻşèğčéĞĹãĆĺãČşãĆÿãČşãAőåĹl’çŤĺæŰźæşŢãAłãAl’ăAőèl’şçt’řãAŕã
ãĆŠåŔĆçĚğãAŮãAęãAŔãAąăAŢãAĎãĂĆ

- åśđæĂğ

ãČŚãČľãČąãČijãĆ£ãĆ£ãĆďãČů		å£ËéëãĺñæŸŐ	
intent	string	Yes	ãČđãČČãČąãĄŢãĄŻãĆŃãĆďãČşãČęãČşãČĹåŘ■ãĆŚæŇĞåőŽãĄŮãĄ¿ãĄŹã
scoreGt	string	No	ãČđãČČãČąãĄŢãĄŻãĆŃä£ąéäijåžęãĆŚæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆår¿èśąãĆď
scoreGe	string	No	ãČđãČČãČąãĄŢãĄŻãĆŃä£ąéäijåžęãĆŚæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆår¿èśąãĆď
score	string	No	ãČđãČČãČąãĄŢãĄŻãĆŃä£ąéäijåžęãĆŚæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆår¿èśąãĆď
scoreLe	string	No	ãČđãČČãČąãĄŢãĄŻãĆŃä£ąéäijåžęãĆŚæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆår¿èśąãĆď
scoreLt	string	No	ãČđãČČãČąãĄŢãĄŻãĆŃä£ąéäijåžęãĆŚæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆår¿èśąãĆď
maxLikelihood	string	No	`true` ãĂĄ `false` ãĆŚæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆår¿èśąãĆď ãČşãČęãČşãČĹã `true` ãĄőåăť åŘĹãĂĄår¿èśąãĆď ãČşãČęãČşãČĹãĄŇæIJĂårđ æŹĆãĄőãĄ£ãČ `false` åăť åŘĹãĂĄår¿èśąãĆď ãČşãČęãČşãČĹãĄŇãĄőä£ąéäijåžęãĄŇæIJĂår `true` ãĄĺãĄŮãĄęåĞęçŘęãĄŮãĄ¿ãĄŹãĂĆ

æŇĞåőŽåŔŕèČ¡ãĄłãĆď ãČşãČęãČşãČĹåŘ■ãĄŕãĂĄéńŸåžęæĎŔåŻşèğčéĞĹãČĺãČşãĆÿãČşãĄŇä¡£çŤĺãĄŮãĄęãĄĎãĆŃæĎŔåŻşè

scoreXxãĄŕ1ãĄđ ãĄŮãĄŃæŇĞåőŽãĄgãĄ■ãĄ¿ãĄŻãĆŞãĂĆèđ ĞæŢřèĺŸèijL'ãĄŮãĄ§åăť åŘĹãĂĄscoreGtãĂĄscoreGeãĂĄscoreã

- ä¡£çŤĺä¿Ń

æĎŔåŻşèğčéĞĹãČćãČĞãČńãĄgåŚĺè¿žæđ IJçţ'ćãĄőãĆď ãČşãČęãČşãČĹåŘ■ãĄŃ âĂŸaroundsearchâĂŹ ãĄĺèĺ■åőŽãĄŢãĆŃãĄęãĄĎãĆŃåăť åŘĹãĄőä¿Ń

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern>
            <nlu intent="aroundsearch" />
        </pattern>
        <template>
            åŚĺè¿žæđ IJçt'ćãĆŠèąÑãĄĎãA¿ãĄŹãĂĆ
        </template>
    </category>
</aiml>
```

Input: ãĄŞãĄőåŚĺè¿žãĆŠæŐćãĄŮãĄęãĂĆ
Output: åŚĺè¿žæđ IJçţ'ćãĆŠèąÑãĄĎãA¿ãĄŹãĂĆ

éŰćéĂčéäĔçŻő: *NLU*

5.4 oneormore

[1.0]

oneormoreèęAçţ'ă âĂIJ_âĂİ, âĂIJ*âĂİãĄŕãĂĄãČŕãĆđ ãČńãČL'ãĆńãČijãČL'ãĄő1ãĄđ ãĄğãĂĄåřŚãĄłãĄŔãĄĺãĆĆ1åĂŃãĄőäżæ
ãĄŞãĄőãČŕãĆđ ãČńãČL'ãĆńãČijãČL'ãĄŃ patternèęAçţ'ăåĘĔãĄőèĺŸè£ŕãĄőæIJĂå¿ŇãĄńãĄĆãĆŃåăť åŘĹãĄŕãĂĄãČęãČijãĆűãĄ
ãĄ¿ãĄ§ãĂĄãĄŞãĄőãČŕãĆđ ãČńãČL'ãĆńãČijãČL'ãĄŃ patternèęAçţ'ăåĘĔãĄőèĺŸè£ŕãĄőäżŮãĄőAIMLãČŚãĆ£ãČijãČşãČđãČČãČ

ãĄŞãĄőãČŕãĆđ ãČńãČL'ãĆńãČijãČL'ãĄńãĆĹãĆŃãČđãČČãČĄåĞęçŘĘãĄĺäżŮãĄőAIMLãČŚãĆ£ãČijãČşãČđãČČãČĄãČşãĆřèęA
ãČŕãĆđ ãČńãČL'ãĆńãČijãČL' âĂIJ_âĂİãĄŕãĂĄ AIMLãČŚãĆ£ãČijãČşãČđãČČãČĄãČşãĆřèęAçţ'ă
`set`ãĂĄ`iset`ãĂĄ`regex`ãĂĄ`bot`

ãĆĹãĆŁãĆĆåĚĹãĄńãČđãČČãČĄåĞęçŘĘãĄŇèąŇãĆŔãĆŇãĄ¿ãĄŹãĂĆãČŕãĆd'ãČńãČL'ãĆńãČijãČL'
âĂIJ*âĂİãĄŕãĂĄãĄŞãĆŇãĆL'ãĄőAIMLãČŚãĆ£ãČijãČşãČđãČČãČĄãČşãĆřèęAçt'ãäĆĹãĆŁãĆĆå¿ŇãĄńãČđãČČãČĄåĞęçŘĘãA
ãČŚãĆ£ãČijãČşãČđãČČãČĄãČşãĆřåĞęçŘĘãĄőèl'şçt'řãĄŕãĂĄ *ãČŚãĆ£ãČijãČşãČđãČČãČĄãČşãĆř*
ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄäãĄŢãĄĎãĂĆ

æňąãĄő2ãĄd'ãĄőä¡£çŤĺä¿ŃãĄğãĄŕãĂĄãĂŇãĄŞãĆŞãĄńãĄąãĄŕãĂ■1å■Ÿèłđã Ą ĺã Ą İã Ą őå¿ŇãĄńçűŽãĄŔ1åĂŃäžëäÿŁãĄőå■Ÿèłc

- ä¡£çŤĺä¿Ń

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ _</pattern>
        <template>
            ãĄŞãĆŞãĄńãĄąãĄŕ
        </template>
   </category>
</aiml>
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕ ãĄĎãĄĎåd'l'ærŮãĄğãĄŹãĄ■
Output: ãĄŞãĆŞãĄńãĄąãĄŕ

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
   <category>
       <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ *</pattern>
       <template>
           ãĄŤæl'§åńŇãĄĎãĄŃãĄŇãĄğãĄŹãĄŃïij§
       </template>
   </category>
</aiml>
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕ ãĄĎãĄĎåd'l'ærŮãĄğãĄŹãĄ■
Output: ãĄŤæl'§åńŇãĄĎãĄŃãĄŇãĄğãĄŹãĄŃïij§

éŰćéĂčéăĚçŻő: *zeroormore* ãĂĄ *ãČŚãĆ£ãČijãČşãČđãČČãČĄãČşãĆř*

5.5 priority

[1.0]

priorityèęAçt'ăäĄŕãĂĄpatternèęAçt'ăåĘĚãĄőãČđãČČãČĄår¿èśąå■Ÿèłđã Ą őåĚĹéă■ãĄń âĂIJ$âĂİ
ãĆŠèĺŸè£řãĄŮãĄ§ãĆĆãĄőãĄğãĂĄäżŰãĄőãČŚãĆ£ãČijãČşãĄőãČđãČČãČĄãĄğęçŘĘãĆĹãĆŁãĆĆãĂĄå¡Şèl'šå■Ÿèłđã Ą őãČđãČČ
äžëäÿŇãĄőä¡£çŤĺä¿ŃãĄğãĄŕãĂĄâĂİãĄŞãĆŞãĄńãĄąãĄŕ * âĂIJãĂĄâĂİãĄŞãĆŞãĄńãĄąãĄŕ *
ãĄĆãĆĹãĄŇãĄĺãĄĘâĂİç■L'ãĄőãČŕãĆd'ãČńãČL'ãĆńãČijãČL'ãĆŠåŔńãĆĂ
patternèęAçt'ăäĄŇèĺŸè£řãĄŢãĆŇãĄęãĄĎãĆŃår¿èl'śãČńãČijãČńãĄŇãĄĆãĄčãĄęãĆĆãĂĄâĂİ$âĂİ
ãĆŠèĺŸè£řãĄŮãĄ§å■Ÿèłđ âĂIJäżŁæŮěâĂİ ãĆŠåĎłåĚĹãĄŮãĄęãČđãČČãČĄãĄŮãĄ¿ãĄŹãĂĆ

- ä¡£çŤĺä¿Ń

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ $äżŁæŮĕãĆĆãĄĎãĄĎåd'l'æřŮãĄğãĄŹãĄ■</pattern>
        <template>
            ãĄİãĄĘãĄğãĄŹãĄ■
        </template>
    </category>

    <category>
        <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ *</pattern>
            <template>
                ãĄŞãĆŞãĄńãĄąãĄŕ
            </template>
        </category>

        <category>
            <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ * ãĄĆãĆŁãĄŇãĄÍãĄĘ</pattern>
            <template>
                ãĄl'ãĄĘãĄĎãĄŞãĄŮãĄ¿ãĄŮãĄę
            </template>
        </category>
</aiml>
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕ äżŁæŮĕãĆĆãĄĎãĄĎåď'l'æřŮãĄğãĄŹãĄ■
Output: ãĄİãĄĘãĄğãĄŹãĄ■
Input: ãĄŞãĆŞãĄńãĄąãĄŕ äżŁæŮĕãĄőåď'l'æřŮãĄŕãĄĎãĄ¿ãĄĎãĄąãĄğãĄŹãĄ■
Output: ãĄŞãĆŞãĄńãĄąãĄŕ
Input: ãĄŞãĆŞãĄńãĄąãĄŕ äżŁæŮĕãĄŕ ãĄĆãĆŁãĄŇãĄÍãĄĘ
Output: ãĄl'ãĄĘãĄĎãĄ§ãĄŮãĄ¿ãĄŮãĄę

éŰćéĂčéăĚçŻő: *word*ãĂĄ *ãČŚãĆ£ãČijãČşãČđãČČãČĄãČşãĆŕ*

5.6 regex

[custom]

regexèęĄçť'ããĄőä¡£çŤÍãĄńãĆĹãĆŁãČęãČijãĆűçŹžèľ'śæŰĞãĄńåŕ¿ãĄŹãĆŃæ■čèęŔèąĺçŔ¿ãĄńãĆĹãĆŃãČŚãĆ£ãČijãČşãČđãČČãĆ
å■Ÿèłđå■Ÿä¡■ãĄőæ■čèęŔèąĺçŔ¿ãĄÿãĄőåŕ¿å£ĲãĂĄæŰĞå■ŮåĹŮãĄńéŰćãĄŹãĆŃæ■čèęŔèąĺçŔ¿ãĄńãĆĆåŕ¿å£ĲãĄŮãĄ¿ãĄŹãĂ

- åśđæĂğ

ãČŚãČľãČąãČijãĆ£	åđŃ	å£ĚéăĹ	èłæŸŐ
pattern	string	No	æ■čèęŔèąĺçŔ¿ãĄğå■ŸèłđãĆŠèĺŸè£ř
template	string	No	regex.txtãČŢãĆąãĆď'ãČńãĄğåőŽç¿l'ãĄŮãĄ§å■Ÿèłđå■Ÿä¡■ãĄőæ■čèęŔèąĺçŔ¿ãĆŠåĹl'çŤÍ
form	string	No	èď'ĞæŢřãĄőå■ŸèłđãĆŠåŘńãĆĄãĄ§æŰĞå■ŮåĹŮãĆŠåŕ¿èśąãĄĺãĄŮãĄ§æ■čèęŔèąĺçŔ¿ãĆŠèĺŸè£ř

regexèęĄçť'ããĆŠèĺŸè£řãĄŹãĆŃéŽŽãĄńãĄŕãĂĄpattern,template,formãĄőãĄĎãĄŽãĆŇãĄŇãĄőåśđæĂğãĆŠæŇĞåőŽãĄŹãĆŃãĄ

æ■čèęŔèąĺçŔ¿ãĄĺãĄŮãĄęäÿ■æ■čãĄłåĂď'ãĄŇæŇĞåőŽãĄŢãĆŇãĄ§åăť'åŘĹãĂĄãĆůãČŁãČłãĆłäÿ■æ■čãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

æ■čèęŔèąĺçŔ¿ãĄğçĲĄçŢĕåŘŕèČ¡æŇĞåőŽïijĹä¿ŃïijŽâĂŹ(a)?âĂŹ)ãĄőãĄ£ãĆŠæŇĞåőŽãĄŮãĄ§åăť'åŘĹãĂĄèľ'śå¡ŞãĄŹãĆŃåăť'å

- ä¡£çŤĺä¿Ń

regexèęAçť ăăĄőåśđæĂğãĄŕãĂĄïijŞãĄd'ãĄőæŰźæşŢãĄğæ■čèęŔèąĺçŔ¿ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ

1ãĄd'çŻőãĄŕãĂĄpatternãĄńçŻt'æŐěæ■čèęŔèąĺçŔ¿ãĆŠèĺŸè£řãĄŹãĆŃæŰźæşŢ(å■Ÿèłđå■Ÿä¡■)ãĄğãĄŹãĂĆ

ãĂŇãĄŞãĆŞãĄńãĄąãĄŕãĂ■ãĂŇãĄŞãĆŞãĄńãĄąãĆŔãĂ■ãĄŕãĄĎãĄŽãĆŇãĆĆåĹĘãĄŃãĄąæŻÿãĄ■åĞęçŘĘãĄńãĆĹãĄčãĄę1å■

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern><regex pattern="ãĄŞãĆŞãĄńãĄą[ãĄŕ|ãĆŔ]" /></pattern>
        <template>
            ãĄŞãĆŞãĄńãĄąãĄŕ
        </template>
    </category>
</aiml>
```

ïijŠãĄd'çŻőãĄŕãĂĄtemplateãĆŠåĹl'çŤĺãĄŹãĆŃæŰźæşŢãĄğãĄŹãĂĆtemplateåśđæĂğãĄń
æ■čèęŔèąĺçŔ¿ãČłãĆźãČĹãČŢãĆąãĆd'ãČń
ãĄńèĺŸèijL'ãĄŮãĄ§ãČĘãČşãČŮãČňãČijãČĹåŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
templateãĄõèĺŸè£řåĘĚåőźãĄŕãĂĄpatternãĄĺåŘŇãĄŸãĄŔå■Ÿèłđå■Ÿä¡■ãĄğãĄŹãĂĆ

æ■čèęŔèąĺçŔ¿ãČłãĆźãČĹãČŢãĆąãĆd'ãČńãĄğåőŽç¿l'ãĄŮãĄęãĄĎãĄłãĄĎãČĘãČşãČŮãČňãČijãČĹåŘ■ãĆŠtemplateãĄğæŇĞåőŽ

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern><regex template="konnichiwa" /></pattern>
        <template>
            ãĄŞãĆŞãĄńãĄąãĄŕ
        </template>
    </category>
</aiml>
```

3ãĄd'çŻőãĄŕãĂĄformãĆŠåĹl'çŤĺãĄŹãĆŃæŰźæşŢãĄğãĄŹãĂĆæŰĞå■ŮåĹŮãĆŠår¿èśąãĄĺãĄŮãĄ§æ■čèęŔèąĺçŔ¿ãĆŠæŇĞåőŽã

ãČđãČČãČĄår¿èśąãĄőãČęãČijãĆűçŹžèl'śæŰĞãĆŠæŰĞå■ŮåĹŮãĄĺãĄŮãĄęæL'śãĄĘãĄ§ãĆĄãĂĄçŹžèl'śæŰĞãĄŇåĹĘãĄŃãĄąã

æŮěæIJñèłđæŰĞå■ŮåĹŮãĄŇåĹĘãĄŃãĄąæŻÿãĄ■åĞęçŘĘãĄńãĆĹãĆŁãĄĽãĄőãĆĹãĄĘãĄłå■ŸèłđãĄńåĹĘåL'šãĄŢãĆŇãĆŃãĄŃ
formãĄńæŇĞåőŽãĄŹãĆŃæ■čèęŔèąĺçŔ¿ãĄŕãĂĄäžěäÿŃãĄőçţĎãĄ£åŘĹãĆŔãĄŻãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

èąĺèĺŸ	æĎŔåŠş
âĂŸ[âĂę]âĂŹâĂŸ[âĂę]âĂŹåĘĚãĄőãĄĎãĄŽãĆŇãĄŃãĄőæŰĞå■ŮãĄńãČđãČČãČĄãĄŹãĆŇãĄřOKãĂĆ
âĂŸA|BâĂŹ	âĂŸ|âĂŹãĄőåůęåŔşãĄőæŰĞå■ŮåĹŮãĄőãĄĎãĄŽãĆŇãĄŃãĄńãČđãČČãČĄãĄŹãĆŇãĄřOKãĂĆ
âĂŸ(X)âĂŹ	æ■čèęŔèąĺçŔ¿XãĄőãĆţãČŰãČŚãĆ£ãČijãČşåŇŰãĂĆXãĄńãČđãČČãČĄãĄŹãĆŇãĄřOKãĂĆ
âĂŸ()?âĂŹ	âĂŸ?âĂŹãĄőçŻt'åL'■ãĄőãĆţãČŰãČŚãĆ£ãČijãČşãĄńãČđãČČãČĄãĄŮãĄęãĆĆãĄŮãĄłãĄŔãĄęãĆĆOKãĂĆ
âĂŸ(?!X)âĂŹæIJĂå¿Ňår¿ãĄŇXãĄńãČđãČČãČĄãĄŮãĄłãĄŚãĆŇãĄřOKãĂĆïijĹäžŰãĄőæŇĞåőŽãĄĺãĄőä¡ţçŤĺãĄŕäÿ■åŔřïijL'

æňąãĄőä¡£çŤĺä¿ŃãĄğãĄŕãĂĄäžëäÿŃãĄőæŰĞãĄőãĄĎãĄŽãĆŃãĄńãĆĆãČđãČČãČĄãĄŮãĄ¿ãĄŹãĂĆ

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern>
            <regex form="äžŁ[ãĄŕãĆŔ]ä¡ŢæŹĆ(ãĄğãĄŹãĄŃ|ãĄğãĄŹ)?" />
        </pattern>
        <template>
            <date format="%HæŹĆ%MåĹę%SçğŠ" />
        </template>
    </category>
</aiml>
```

ãĂŇäžŁãĄŕä¡ŢæŹĆãĂ■ãĂŇäžŁãĄŕä¡ŢæŹĆãĄğãĄŹãĄŃãĂ■ãĂŇäžŁãĄŕä¡ŢæŹĆãĄğãĄŹãĂ■
ãĂŇäžŁãĆŔä¡ŢæŹĆãĂ■ãĂŇäžŁãĆŔä¡ŢæŹĆãĄğãĄŹãĄŃãĂ■ãĂŇäžŁãĆŔä¡ŢæŹĆãĄğãĄŹãĂ■

éŰćéĂčéăĚçŻő: *ãČŢãĆąãĆd'ãČńçőąçŘĘïijŽregex_templates*

5.7 set

[1.0]

setèęAçt'ãäĄğãĄŕãĂĄåd'ŰéČĺãČŢãĆąãĆd'ãČńãĄğæŇĞåőŽãĄŮãĄ§èd'ĞæŢřãĄőå■Ÿèłđå ĹŮãĄőãĄĎãĄŽãĆŇãĄŃãĄĺãĄőãČđãČđãČČãČĄãŕ¿èśąãĄőå■ŸèłđãĄŕãĂĄãĂĄ*å■Ÿèłđ ãČłãĆźãČĹãČŢãĆąãĆd'ãČńïijĹsetsïijĽ*
ãĄńãČłãĆźãČĹå¡ćåijŔãĄğåĹŮèĺŸãĄŮãĄ¿ãĄŹãĂĆ

èęAçt'ãäĄĺãĄŮãĄęãĂĄèd'ĞæŢřèŃśå■Ÿèłđã ĄŃãĆĽ'ãĄłãĆŃæŰĞå■ŮåĹŮãĆĆæŇĞåőŽãĄŇåŔřèČ¡ãĄğãĄŹãĄŃãĂĄãĄĺãĄőåät'ã

åřŽãĂĄèŃśå■Ÿèłđå ĹŮãĄĺæŮěæIJňèłđæŰĞå■ŮåĹŮãĄŃæůůåIJĺãĄŹãĆŃæŇĞåőŽãĄőåät'åŘĹãĄőåŃŢä¡IJãĄŕä£ÌèĺijãĄğãĄ■ãĄ¿

- åśđæĂğ

| ãČŚãČľãČąãĆĆãĆąãĆĆãĆĆãĆĆ

(continued from previous page)

```
    </category>
</aiml>
```

Input: çğĄãĄŕå■ČèŚĽãĄńä¡ŔãĆŞãĄğãĄĎãĄ¿ãĄŹãĂĆ
Output: çğĄãĄŕæİśäžñãĄńä¡ŔãĆŞãĄğãĄĎãĄ¿ãĄŹãĂĆ

éŰćéĂčéăĚçŻő: *iset* ãĂĄ *ãČŢãĆąãĆd'ãČńçőąçŘĘïijŽsets*

5.8 topic

[1.0]

topicèęAçt'ăăĆŠä¡£çŤĺãĄŹãĆŃãĄĺãĂĄãĆůãĆźãČĘãČăăĄőäžĹçt'Ďåd'L'æŢřtopicãĄőåĂd'ãĄÑnameãĄńæŇĞåőŽãĄŮãĄ§åĂd'ãĄ

topicãĄŕãĂĄæňąãĄõãĆĹãĄĘãĄńtemplateèęAçt'ăăĄősetãĆŠçŤĺãĄĎãĄęåĂd'ãĆŠèĺ■åőŽãĄŹãĆŃãĄŞãĄĺãĄÑãĄğãĄ■ãĄ¿ãĄŹãĂĆ

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern><!-- pattern description goes here --></pattern>
        <template>
            <think><set name="topic">FISHING</set></think>
            <!-- response sentence goes here-->
        </template>
    </category>
</aiml>
```

topicèęAçt'ăăĄőæİąäżűãĄŕãĂĄpatternãĄõãČđãČČãČĄåĞęçŘĘå¿ÑãĄńèl'Ţä¿ąãĄŢãĆŃãĄ¿ãĄŹïijĹAIMLåĞęçŘĘãĄőå§žæIJñãČ

åŘÑäÿĂãĄőpatternåőŽç¿l'ãĄğtopicæŇĞåőŽãĄÑãĄłãĄĎãĆĆãĄõãĄÑå£ĚèęĄãĄłåăt'åŘĹãĄŕãĂĄçŔ¿åIJĺèĺ■åőŽãĄŢãĆŃãĄęãĄĎ

äžěäÿÑãĄőä¡£çŤĺä¿ÑãĄğãĄŕãĂĄâİãĄłãĄIJãĄİãĆŃãĆŠç§ěãĄčãĄęãĄĎãĄ¿ãĄŹãĄÑïij§âĂİãĄĺãĄĎãĄĘãČęãČijãĆűçŹžèl'śãĄ

- ä¡£çŤĺä¿Ń

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern>ãĄłãĄIJãĄİãĆŃãĆŠç§ěãĄčãĄęãĄĎãĄ¿ãĄŹãĄÑïij§</pattern>
        <topic>FISHING</topic>
        <template>
            å■Ră¿ŻãĄőéăČãĂĄçĹűãĄÑæŢŹãĄĹãĄęãĄŔãĆŃãĄ¿ãĄŮãĄ§ãĂĆ
        </template>
    </category>

    <category>
        <pattern>ãĄłãĄIJãĄİãĆŃãĆŠç§ěãĄčãĄęãĄĎãĄ¿ãĄŹãĄÑïij§</pattern>
```

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```
        <topic>COOKING</topic>
        <template>
            å■Ŕä¿ŻãĄőéăČãĂĄæŕ■ãĄŇæŢŹãĄĹãĄęãĄŔãĆŇãĄ¿ãĄŮãĄ$ãĂĆ
        </template>
    </category>
</aiml>
```

éŰćéĂčéăĚçŻő: *that*, *set(templateèęĄçţ'ă)*, *think*

5.9 that

[1.0]

thatèęĄçţ'ăăĆŠçŤĺãĄĎãĆŃãĄŞãĄĺãĄğãĂĄ1ãĄd'åL'■ãĄőåŕ¿èl'śãĄńãĄŁãĄŚãĆŃãĆůãĆźãČĘãČăãĄőå£IJç■ŤæŰĞãĄŇæŇĞåőŽã

thatèęĄçţ'ăăĄőãĄŞãĄőåČ■ãĄ■ãĄńãĆĹãĆŁãĂĄåŕ¿èl'śåĘĚåőźãĄőæţĄãĆŃãĆŠèĂČæĚőãĄŮãĄ$åŕ¿èl'śãČńãČijãČńèĺŸè£řãĄŇåŔ
ä¿ŃãĄĹãĄřãĂĄâĂİãĄŕãĄĎâĂİãĂĄâĂİãĄĎãĄĎãĄĹâĂİ
ãĄĺãĄĎãĄčãĄ$ãĂĄæśŐçŤĺçŽĎãĄłãČęãČijãĆűçŹžèl'śæŰĞãĄńåŕ¿ãĄŹãĆŃãĆůãĆźãČĘãČăå£IJç■ŤæŰĞãĆŠãĂĄçŻt'åL'■ãĄőåŕ¿

thatèęĄçţ'ăăĄőæİąäżűãĄŕãĂĄpatternãĄőãČđãČČãČĄåĞęçŘĘå¿ŇãĄńèl'Ţä¿ąãĄŢãĆŃãĄ¿ãĄŹïijĹAIMLåĞęçŘĘãĄőå§žæIJñãČńã

åŘŇäÿĂãĄőpatternåőŽç¿l'ãĄğthatæŇĞåőŽãĄŇãĄłãĄĎãĆĆãĄőãĄŇå£ĚèęĄãĄłåăt'åŘĹãĄŕãĂĄtemplateãĄőthatèęĄçţ'ăăĄğåŘŰ

- ä¡£çŤĺä¿Ń

äžěäÿŇãĄőä¡£çŤĺä¿ŃãĄğãĄŕãĂĄçŻt'åL'■ãĄőåŕ¿èl'śãĄőãĆůãĆźãČĘãČăå£IJç■ŤæŰĞãĄŇãĂŇãĆşãČijãČŠãČijãĄńçăĆçşŰãĄĺãČ

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern>çğĄãĄŕãĆşãČijãČŠãČijãĄŇåě¡ãĄ■ãĄğãĄŹ</pattern>
        <template>ãĆşãČijãČŠãČijãĄńçăĆçşŰãĄĺãČ$ãČńãĆŕãĆŠåĚěãĆŇãĄ¿ãĄŹãĄŃ</template>
    </category>

        <category>
        <pattern>çğĄãĄŕçt'ĚèŇűãĄŇåě¡ãĄ■ãĄğãĄŹ</pattern>
        <template>çt'ĚèŇűãĄńãČňãČćãČşãĆŠåĚěãĆŇãĄ¿ãĄŹãĄŃ</template>
    </category>

    <category>
        <pattern>ãĄŕãĄĎ</pattern>
        <that>ãĆşãČijãČŠãČijãĄńçăĆçşŰãĄĺãČ$ãČńãĆŕãĆŠåĚěãĆŇãĄ¿ãĄŹãĄŃ</that>
        <template>ãĆŔãĄŇãĆŁãĄ¿ãĄŮãĄ$</template>
    </category>

    <category>
        <pattern>ãĄĎãĄĎãĄĹ</pattern>
        <that>ãĆşãČijãČŠãČijãĄńçăĆçşŰãĄĺãČ$ãČńãĆŕãĆŠåĚěãĆŇãĄ¿ãĄŹãĄŃ</that>
        <template>ãČŰãČl'ãČČãĆŕãĄğãĄŹãĄ■</template>
    </category>

    <category>
        <pattern>ãĄŕãĄĎ</pattern>
```

(continues on next page)

(continued from previous page)

```
        <that>çt'ĚèŇűãĄńãČňãČćãČşãĆŠåĚěãĆŇãĄ¿ãĄŹãĄŃ</that>
        <template>ãĆŕãĄŃãĆŁãĄ¿ãĄŮãĄ§</template>
    </category>

    <category>
        <pattern>ãĄĎãĄĎãĄĹ</pattern>
        <that>çt'ĚèŇűãĄńãČňãČćãČşãĆŠåĚěãĆŇãĄ¿ãĄŹãĄŃ</that>
        <template>ãĆźãČĹãČňãČijãČĹãČĘãĆčãČijãĄğãĄŹãĄ■</template>
    </category>
</aiml>
```

éŰćéĂčéăĚçŻő: *topic*

5.10 word

[1.0]

AIMLãĄőæIJĂãĆĆå§žæIJńçŽĎãĄłãČŚãĆ£ãČijãČşãČđãČČãČĄãČşãĆřèęAçt'ăãĄğãĄŹãĂĆ
wordèęAçt'ăãĄŕãĂĄå■Ÿèłđ(åĹĘãĄŃãĄąæŻÿãĄ■ãĄŢãĆŃãĄ§åŘĎæŰĞå■ŮåĹŮãĄőå■Ÿä¡■)ãĆŠèąĺãĄŮãĄęãĄŁãĆŁãĂĄår¿èľśã
èŃśå■Ÿèłđ ãĄńãĄŁãĄĎãĄęãĄŕåď ğæŰĞå■ŮãĄĺåřŔæŰĞå■ŮãĆŠåŇžåĹěãĄŻãĄŻãČđãČČãČĄåĞęçŘĘãĆŠèąŇãĄĎãĄ¿ãĄŹãĂĆ
ãĄ¿ãĄ§ãĂĄåĚĺèğŠæŰĞå■ŮãČżå■ŁèğŠæŰĞå■ŮãĄńãĄď ãĄĎãĄęãĄŕãĂĄèŃśæŢřå■ŮãĄŕå■ŁèğŠãĂĄãĆńãČŁæŰĞå■ŮãĄŕåĚĺèğ

äžěäÿŃãĄőä¡£çŤĺä¿ŃãĄğãĄŕHELLO, hello, Hello, HeLlOãĄőãĄľãĆŇãĄğãĆĆãČđãČČãČĄãĄŮãĄ¿ãĄŹãĂĆ

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern>HELLO</pattern>
        <template>
            ãĄŞãĆŞãĄńãĄąãĄŕ
        </template>
    </category>
</aiml>
```

éŰćéĂčéăĚçŻő: *priority*

5.11 zeroormore

[1.0]

zeroormoreèęAçt'ă âĂIJ^âĂİ, âĂIJ#âĂİ ãĄŕãĂĄãČŕãĆď'ãČńãČL'ãĆńãČijãČL'ãĄő1ãĄď'ãĄğãĂĄåřŚãĄłãĄŔãĄĺãĆĆ0åĂŃãĄőäżż
ãĄŞãĄőãČŕãĆď'ãČńãČL'ãĆńãČijãČL'ãĄŇ patternèęAçt'ăåĘĚãĄőèĺŸè£ŕãĄőæIJĂå¿ŇãĄńãĄĆãĆŃåăt'åŘĹãĄŕãĂĄãČęãČijãĆűãĄ
ãĄ¿ãĄ§ãĂĄãĄŞãĄőãČŕãĆď'ãČńãČL'ãĆńãČijãČL'ãĄŇ patternèęAçt'ăåĘĚãĄőèĺŸè£ŕãĄőäżŮãĄőAIMLãČŚãĆ£ãČijãČşãČđãČČãČ

ãĄŞãĄőãČŕãĆď'ãČńãČL'ãĆńãČijãČL'ãĄńãĆĹãĆŃãČđãČČãČĄåĞęçŘĘãĄĺäżŮãĄőAIMLãČŚãĆ£ãČijãČşãČđãČČãČĄãČşãĆřèęA
ãČŕãĆď'ãČńãČL'ãĆńãČijãČL' âĂIJ^âĂİãĄŕãĂĄ AIMLãČŚãĆ£ãČijãČşãČđãČČãČĄãČşãĆřèęAçt'ă
`set`ãĂĄ`iset`ãĂĄ`regex`ãĂĄ`bot`
ãĆĹãĆŁãĆĆåĚĹãĄńãČđãČČãČĄåĞęçŘĘãĄŇèąŇãĆŔãĆŃãĄ¿ãĄŹãĂĆãČŕãĆď'ãČńãČL'ãĆńãČijãČL'
âĂIJ#âĂİãĄŕãĂĄãĄŞãĆŃãĆL'ãĄőAIMLãČŚãĆ£ãČijãČşãČđãČČãČĄãČşãĆřèęAçt'ăãĆĹãĆŁãĆĆå¿ŇãĄńãČđãČČãČĄåĞęçŘĘãA

ãČŕãĆď'ãČńãČL'ãĆńãČijãČL'ãĆŠéĂčçűŽãĄŮãĄęèĺŸè£ŕãĄŮãĄ§patternèęAçt'ăãĆŞæŇĞåőŽãĄŹãĆŃåăt'åŘĹãĄńãĄŕãĂĄ*oneorm*
ãĄĺãĄőæůůåŘĹãĄŕéĄ£ãĄŚãĄęãĄŔãĄăãĄŢãĄĎãĂĆåĚěåŁŻæŰĞãĄőèl'šå¡ŞãĄŹãĆŃçfĎåŻšãĄőå■ŸèłđæŢřãĄńãĆĹãĆŁãĂĄ*star*

æňąãĄőä¡£çŤĺä¿ŃãĄğãĄŕãĂĄãĂŇãĄŞãĆŞãĄńãĄąãĄŕãĂ■ãĄőãĄ£ãĂĄãĄĆãĆŃãĄĎãĄŕãĂĄãĂŇãĄŞãĆŞãĄńãĄąãĄŕãĂ■ãĄğå

èľşçť řãĄŕãĂĄãČŚãĆ£ãČijãČşãČđãČČãČĄãČşãĆř ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăãĄŢãĄĎãĂĆ

- ä¡£çŤĺä¿Ń

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ ^</pattern>
        <template>
            ãĄŞãĆŞãĄńãĄąãĄŕ
        </template>
    </category>

    <category>
        <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ #</pattern>
        <template>
            ãĄŤæl’§åńÑãĄĎãĄŃãĄÑãĄğãĄŹãĄŃïij§
        </template>
    </category>
</aiml>
```

éŰćéĂčéăĚçŻő: *oneormore* ãĂĄ *ãČŚãĆ£ãČijãČşãČđãČČãČĄãČşãĆř*

CHAPTER 6

templateèęĄçťăåĘĚãĄőå■ŘèęĄçťă

æIJňçńăăĄğãĄŕtemplateèęĄçťăåĘĚãĄğèÍŸè£řåŔŕèČ¡ãĄłå■ŘèęĄçťăăĄńãĄd'ãĄĎãĄęèłňæŸŐãĄŮãĄ¿ãĄŹãĂĆ

å■ŘèęĄçťăăĄőä¡£çŤÍĺåŔŕåŘęãĄńãĄd'ãĄĎãĄęãĄŕãĂĄãĆńãĆźãĆ£ãČđãĆd'ãĆžãĄŇåŔŕèČ¡ãĄğãĄŹãĂĆèl'şçt'řãĄŕ
ãĆńãĆźãĆ£ãČătemplateèęĄçt'ă ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăăĄŢãĄĎãĂĆ

åŕ¿èl'śãČŮãČl'ãČČãČĹãČŢãĆl'ãČijãČăăĄğãĆţãČİãČijãČĹãĄŮãĄęãĄĎãĆŃtemplateãĄőèęĄçť'ăåĘĚãĄńèÍŸè£řåŔŕèČ¡ãĄłå■ŘèęĄ
åĚňåijŔãĄő AIML
2.xäżŢægŸãĄńåŕ¿ãĄŮãĂĄçŃňèĞłãĄőèęĄçť'ăăĆżãČČãČĹãĆŠè£¡åŁăăĄŮãĄęãĄĎãĄ¿ãĄŹãĂĆ

- *addtriple*: RDFãČŁãČňãČČãĆÿãČŹãČijãĆźãĄÿãĄőãĆĺãČňãČąãČşãČĹè£¡åŁăèęĄçť'ă
- *authorise*: ãČęãČijãĆűãČ■ãČijãČńãĄńãĆĹãĆŁAIMLèęĄçť'ăăĄőåő§èąŇæÍl'ãĄőåĹĞãĆŁæŻ£ãĄĹèęĄçť'ă
- *bot*: botåŽžæIJL'ãĄőãČŮãČ■ãČŚãČĘãĆčãĄőåŔŰå¿ŮèęĄçť'ă
- *button*: ãČIJãĆ£ãČşæŁijäÿŃãĆŠä£ČãĄŹèęĄçť'ă
- *card*: çŤżåČŔãĂĄãČIJãĆ£ãČşãĂĄãĆ£ãĆd'ãČĹãČńãĂĄãĆţãČŰãĆ£ãĆd'ãČĹãČńãĆŠ1ãĄd'ãĄńãĄ¿ãĄÍãĆĄãĆŃèęĄçť'ă
- *carousel*: ãĆńãČijãČL'èęĄçť'ăăĆŠãĄ¿ãĄÍãĆĄãĆŃèęĄçť'ă
- *condition*: æİąäżűåĹĘåšŘãĄŮãĄęåĞęçŘĘãĆŠèąŇãĄĘèęĄçť'ă
  - *å■ŸäÿĂåĹd'åőŽ*
  - *æİąäżűåĹĘåšŘ*
  - *èd'ĞœŢřæİąäżűãĄğãĄőåĹĘåšŘ*
  - *ãČńãČijãČŮåĞęçŘĘ*
- *date*: æŮěäżŸãĂĄæŹĆåĹżåŔŰå¿ŮèęĄçť'ă
- *delay*: éĄĚåżűèęĄæśĆèÍ■åőŽèęĄçť'ă
- *deletetriple*: RDFãČŁãČňãČČãĆÿãČŹãČijãĆźãĄŃãĆL'ãĄőãĆĺãČňãČąãČşãČĹåL'ŁéŹd'èęĄçť'ă
- *denormalize*: å■ŸèłđãĄŃãĆL'æŰĞå■ŮåĹŮãĄÿãĄőåd'L'æŔŻèęĄçť'ă
- *eval*: åd'L'æŢřåĂd'ãĄőæŰĞå■ŮåĹŮåŇŰèęĄçť'ă(learn/learnfãĄğåĹl'çŤÍïijL'

- *explode*: æŰĞå■ŮåĹĘåL'šèęAçt'ă
- *first*: åĚĹéă■å■ŸèłđåŕŰå¿ŮèęAçt'ă
- *extension*ïijŽæŃąåijţæl'§èČ¡èęAçt'ă
- *formal*: åĚĹéă■æŰĞå■Ůåd'ğæŰĞå■ŮåŇŰèęAçt'ă
- *gender*: äÿL'äžžçğřäžčåŘ■èl'đãĄőæĂğåĹĕåd'L'æŔŻèęAçt'ă
- *get*: åd'L'æŢřåĘĚåőźåŔŰå¿ŮèęAçt'ă
- *id*: ãĆŕãČl'ãĆd'ãĆćãČşãČĹåŘ■åŔŰå¿ŮèęAçt'ă
- *image*: çŤżåČŔæČĚåăśæŇĞåőŽèęAçt'ă
- *implode*: æŰĞå■ŮåĹŮçţŘåŘĹèęAçt'ă
- *input*: patternæŰĞåŔŰå¿ŮèęAçt'ă
- *interval*: æŹĆåĹżåůőåĹĘèlĺĹçőŮèęAçt'ă
- *json*: JSONèęAçt'ă
- *learn*: ãČęãČijãĆűåŻžæIJL'categoryçŹżéŇšèęAçt'ă
- *learnf*: ãČęãČijãĆűåŻžæIJL'categoryçŹżéŇšèęAçt'ă
- *li*: åĹĘåšŘæİąäżűèÍŸè£řèęAçt'ă
- *link*: URLæČĚåăśæŇĞåőŽèęAçt'ă
- *list*: ãČłãĆźãČĹå¡ćåijŔæČĚåăśæŇĞåőŽèęAçt'ă
- *log*: ãČ■ãĆŕåĞžåŁŻèęAçt'ă
- *lowercase*: èŃśæŰĞå■ŮåřŔæŰĞå■ŮåŇŰèęAçt'ă
- *map*: è¿đæŻÿåĹl'çŤĺãĄőåd'L'æŔŻèęAçt'ă
- *nluintent*: NLUãĆd'ãČşãČĘãČşãČĹåŔŰå¿ŮèęAçt'ă
- *nluslot*: NLUãĆźãČ■ãČČãČĹåŔŰå¿ŮèęAçt'ă
- *normalize*: æŰĞå■ŮåĹŮãĄŃãĆL'å■Ÿèłđã Ąÿã Ąőåd'L'æŔŻèęAçt'ă
- *oob*: Out of BandèęAçt'ă
- *olist*: ãĆłãČijãČĂãČijãČłãĆźãČĹå¡ćåijŔæŇĞåőŽèęAçt'ă
- *person*: äÿĂãČżäžŇäžžçğřäżčåŘ■èl'đåd'L'æŔŻèęAçt'ă
- *person2*: äÿĂãČżäžŇäžžçğřäżčåŘ■èl'đãĄĺäÿL'äžžçğřäżčåŘ■èl'đãĄőåd'L'æŔŻèęAçt'ă
- *program*: ãČŮãČ■ãĆŕãČl'ãČäãČŘãČijãĆÿãČğãČşåŔŰå¿ŮèęAçt'ă
- *random*: ãČl'ãČşãČĂãČäåĹĘåšŘæŇĞåőŽèęAçt'ă
- *reply*: ãČęãČijãĆűãAÿãĄőæŔŘçd'žåĘĚåőźæŇĞåőŽèęAçt'ă
- *request*: åĚěåŁŻåśěæ■t'åŔŰå¿ŮèęAçt'ă
- *resetlearn*: learnæČĚåăśãČłãĆżãČČãČĹèęAçt'ă
- *resetlearnf*: learnfæČĚåăśãČłãĆżãČČãČĹèęAçt'ă
- *response*: åĞžåŁŻåśěæ■t'åŔŰå¿ŮèęAçt'ă
- *rest*: åĚĹéă■å■Ÿèłđäžěåd'ŰãĄőåŔŰå¿ŮèęAçt'ă
- *set*: åd'L'æŢřèĺ■åőŽèęAçt'ă
- *select*: RDFãČŁãČňãČČãĆÿãČŹãČijãĆźãĄőæd'IJçt'ćèęAçt'ă
- *sentence*: èŃśæŰĞæŢt'å¡ćèęAçt'ă
- *size*: ãĆńãČĘãĆt'ãČłæŢřåŔŰå¿ŮèęAçt'ă

- *space*: å■ŁèğŠãĆźãČŽãČijãĆźæŇ£åĚèęĄçť˘ă
- *split*: æŰĞçńăåĹĘåL’šèęĄçť˘ă
- *sr*: sraiãĄÍstarãĄőçIJĄçŢěèęĄçť˘ă
- *srai*: ãČŚãĆ£ãČijãČşãČđãČČãČĄåĘ■åő§èąŇèęĄçť˘ă
- *sraix*: REST APIåŚijãĄşåĞžãĄŮèęĄçť˘ă
- *star*: ãČŕãĆd’ãČńãČL’ãĆńãČijãČL’åŔŰå¿ŮèęĄçť˘ă
- *system*: ãĆůãĆźãČĘãČăăĆşãČijãČńåő§èąŇèęĄçť˘ă
- *that*: éĄŐåŐżå£IJç■ŤæŰĞåŔŰå¿ŮèęĄçť˘ă
- *thatstar*: éĄŐåŐżå£IJç■ŤæŰĞåĘĚãČŕãĆd’ãČńãČL’ãĆńãČijãČL’åŔŰå¿ŮèęĄçť˘ă
- *think*: åĘĚéČĺåĞęçŘĘèĺŸè£řèęĄçť˘ă
- *topicstar*: topicåĘĚãČŕãĆd’ãČńãČL’ãĆńãČijãČL’åŔŰå¿ŮèęĄçť˘ă
- *uniq*: RDFãČŁãČňãČČãĆÿãČŹãČijãĆźãĄőæd’IJçť´ćèęĄçť˘ă
- *uppercase*: èŃśæŰĞå■Ůåd’ğæŰĞå■ŮåŇŰèęĄçť˘ă
- *video*: ãČŞãČĞãĆŁæČĚåăśæŇĞåőŽèęĄçť˘ă
- *vocabulary*: ãĆůãČŁãČłãĆŁå■ŸèłđæŢřåŔŰå¿ŮèęĄçť˘ă
- *word*: å■Ÿèłđã ČŐãČijãČL’ãĆŠçd’žãĄŹåőŽç¿ľ
- *xml*: æIJłåőŽç¿ľXMLãČŐãČijãČL’ãĄőåőŽç¿ľ

åřŽãĂĄtemplateãĄőå■ŘèęĄçť˘ăăĄŕãĂĄéĚ■äÿŃãĄńäÿŁèĺŸãĄőå■ŘèęĄçť˘ăăĆŠèĺŸè£řãĄŹãĆŃãĄŞãĄĺãĄğèd’ĞåŘĹçŽĎãĄńåŘĎ

æIJňçńăăĄőåŘĎå■ŘèęĄçť˘ăăĄőèłñæŸŐãĄğèĺŸè£řãĄŹãĆŃæŇĞåőŽåŕřèČ¡ãĄłå■ŘèęĄçť˘ăăĄőéăĚçŻőãĄŕãĂĄèęłãĄĺãĄłãĆŃå■Ř

äžěäÿŃãĄőèęĄçť˘ăăĄŕåĞęçŘEçţŘædIJãĄŇçl’žæŰĞå■ŮãĄőçČžãĂĄå■Ÿä¡ŞãĄğä¡£çŤĺãĄŮãĄ§åăt’åŘĹãĄńãĄŕãĆćãČşãČđãČČãČ

- addtriple
- deletetriple
- jsonãĂĂïijĹåŔŰå¿ŮãĄőåăt’åŘĹãĆŠéŹd’ãĄŔïijL’
- learn
- learnf
- resetlearn
- resetlearnf
- think

6.1 èľşçť˘ř

ãĄŞãĄőãĆżãĆŕãĆůãČğãČşãĄğãĄŕãĂĄAIMLãĄőtemplateèęĄçť˘ăåĘĚãĄńèĺŸè£řãĄŹãĆŃèęĄçť˘ăăĄőèłñæŸŐãĆŠèąŇãĄĐãĄ¿ãĄ

ãĄżãĄĺãĆŞãĄľãĄőèęĄçť˘ăăĄŕXMLãĄőåśđæĂğãĄ¿ãĄ§ãĄŕå■ŘèęĄçť˘ăăĆŠè£¡åŁăăĄŮãĄęãĂĄãČĞãČijãĆ£ãĆŠåĹľçŤĺãĄŮãĄ¿ã

åŘĎèęĄçť˘ăăĄőĚĹéă■ãĄő[âĂę]ãĄŕãĂĄåŕ¿èśąãĄőèęĄçť˘ăăĄŇæIJĂåĹİãĄńåőŽç¿ľãĄŢãĆŇãĄ§AIMLãĄőãČŘãČijãĆÿãČğãČşãĆ

6.1.1 addtriple

[2.0]

addtripleèęĄçťăăĄŕăĂĄRDFãČŁãČňãČČãĆÿãČŹãČijãĆźãĄńãĆĺãČňãČąãČşãČĹ(ç§ěè■Ÿ)ãĆŠè£¡åŁăăĄŮãĄ¿ãĄŹãĂĆ ãĆĺãČňãČąãČşãČĹãĄőæğŃæĹŘèęĄçťăăĄńãĄŕãĂĄsubject (äÿżèłđ)ãĂĄpredicate (è£řèłđ)ãĂĄobject (çŻőçŽĎèłđ)ãĄő3ãĄď ãĄőãĆćãĆď ãČĘãČăãĄŇãĄĆãĆŁãĄ¿ãĄŹãĂĆ

addtripleèęĄçťăăĄőçţŘæđIJæŰĞå■ŮåĹŮãĄŕãĂĄåÿÿãĄńçľ žæŰĞå■ŮãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ
addtripleèęĄçťăăĄőèľşçťřãĄńãĄď ãĄĎãĄęãĄŕãĂĄ*RDFãĆţãČĺãČijãČĹ*
ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăãĄŢãĄĎãĂĆ

- å■ŘèęĄçťă

ãČŠãČľãČąãČijãĆ£	åđŃ	åĚĚé■ĹæŸŐ	
subj	string	Yes	subject (äÿżèłđ)ãĄőåĂď
pred	string	Yes	predicate (è£řèłđ)ãĄőåĂď
obj	string	Yes	object (çŻőçŽĎèłđ)ãĄőåĂď

æŇĞåőŽãĄŢãĆŇãĄ§åĂď ãĄŕæď IJçť ćãĆŠåŁźçŐĞçŽĎãĄńèąŇãĄĘçĆžãĂĄçţśäÿĂãĆşãČijãČĽïijĹèŃśæŢřèĺŸåŔůïijŽå■ŁèğŠãĂ

åĂď ãĄńçľ žæŰĞå■ŮïijĹçľ žçŹ¡ãĄőãĄ£ãĆŠåŘńãĆĂïijĽãĆŠæŇĞåőŽãĄŮãĄ§åäť åŘĹãĂĄåő§èąŇæŹĆãĄńä¿Ńåď ŰãĄŇçŹžçŤ§ã

äżěäÿŃãĄőä¡£çŤĺä¿ŃãĄğãĄŕãĂĄãČęãČijãĆűãĄőçŹžèľśæŰĞãĂŇçğĄãĄŕãĆńãČňãČijãĄŇåě¡ãĄ■ãĄăãĂ■ãĄńåŕ¿ãĄŮãĄęãĂĄsu
object=âĂŹãĆńãČňãČijâĂŹ ãĄőãĆćãĆď ãČĘãČăãĄğæğŃæĹŘãĄŢãĆŇãĆŇãĆĺãČňãČąãČşãČĹ(ç§ěè■Ÿ)ãĆŠRDFãČŁãČňãČČãĆÿ

- ä¡£çŤĺä¿Ń

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern>* ãĄŕ * ãĄŇ åě¡ãĄ■ #</pattern>
        <template>
            <addtriple>
                <subj><star /></subj>
                <pred>åě¡ãĄ■</pred>
                <obj><star index="2"/></obj>
            </addtriple>
            åě¡ãĄ£ãĆŠçŹżéŇšãĄŮãĄ¿ãĄŮãĄ§
        </template>
    </category>
</aiml>
```

Input: çğĄ ãĄŕ ãĆńãČňãČij ãĄŇåě¡ãĄ■ãĄă
Output: åě¡ãĄ£ãĆŠçŹżéŇšãĄŮãĄ¿ãĄŮãĄ§

çŹżéŇšãĆŠèąŇãĄčãĄ§çţŘæđIJãĄőçćžèł■æŰźæşŢãĄŕãĂĄ*uniq*, *select* ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăãĄŢãĄĎãĂĆ

éŰćéĂčéăĚçŻő: *deletetriple*, *select*, *uniq*, *RDFãĆţãČĺãČijãČĹ*

6.1.2 authorise

[1.0]

authoriseèęĄçt'ăăĆŠä¡£ãĄĘãĄŞãĄÍãĄńãĆĹãĆŁãĂĄtemplateèęĄçt'ăåĘĚãĄńèÍŸè£řãĄŢãĆÑãĆÑAIMLèęĄçt'ăăĆŠåő§èąÑãĄŹãĆ

ãČęãČijãĆűãĄÍãĄŮãĄęauthoriseèęĄçt'ăãĄőroleåśđæĂğãĄğæÑĞåőŽãĄŢãĆÑãĄ§æÍ'éŹŘãĄŇçĎąãĄĎåăt'åŘĹãĂĄauthoriseèęĄç
èľ§çt'řãĄŕ SecurityãĄő *æĽ£èł*■ ãĆŠåŘĆçĚğãĄŮãĄęãĄŔãĄăãĄŢãĄĎãĂĆ

- åśđæĂğ

ãĆŠãČľãČãĆČãĆãĆŠãČ£ãĆŚ	åđŃ	å£Ěéăĺ	æŸŐ
role	string	Yes	ãČ■ãČijãĆńåŘ■ãĂĆ*ãČęãČijãĆűãĆřãČńãČijãČŮãČŢãĆąãĆď'ãČń* ãĄğèęŘåőŽ
denied_srai	string	No	èł■èĺijåď'śæŢŮæŹĆãĄősraiçŤĺçŹžèľ'śæŰĞ

ãČęãČijãĆűãĆřãČńãČijãČŮãČŢãĆąãĆď'ãČń ãĄğèęŘåőŽãĄŢãĆÑãĄęãĄĎãĄłãĄĎâĂİãČ■ãČijãĆńåŘ■âĂİãĆŠæÑĞåőŽãĄŮãĄ§

- ä¡£çŤĺä¿Ń

ãĄŞãĄőä¡£çŤĺä¿ŃãĄğãĄŕãĂĄãČęãČijãĆűãĄőæÍ'éŹŘãĄńâĂİrootâĂİãĄÑãĄĆãĆÑåăt'åŘĹãĄőãĄ£ãĂĄvocabularyãĄőåĘĚåőźãĆ
ãČęãČijãĆűãĄńæÍ'éŹŘãĄÑãĄłãĄĎåăt'åŘĹãĂĄãĆşãČşãČŢãĆčãĆřãČńãČijãĆůãČğãČşãĄğåőŽç¿ľãĄŢãĆÑãĄ§ãĂĄdenied_sraiï¡

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern>ãČIJãĆ■ãČčãČŰãČl'ãČłãČłãĆźãČĹæŢř</pattern>
        <template>
            <authorise role="root">
                <vocabulary />
            </authorise>
        </template>
    </category>
</aiml>
```

ãĄ¿ãĄ§ãĂĄdenied_sraiåśđæĂğãĆŠæÑĞåőŽãĄŹãĆÑãĄŞãĄÍãĄğãĂĄãČęãČijãĆűãĄńæÍ'éŹŘãĄŇçĎąãĄĎåăt'åŘĹãĄőãČĞãČŢã

ïijĹdenied_sraiãĄőåĂď'ãĆŠpatternèęĄçt'ăãĄńåőŽç¿ľãĄŮãĄ§ãĆůãČŁãČłãĆłãĄÑå£ĚèęĄãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆïijĽ

```
<?xml version="1.0" encoding="UTF-8"?>
<aiml version="2.0">
    <category>
        <pattern>ãČIJãĆ■ãČčãČŰãČl'ãČłãČłãĆźãČĹæŢř</pattern>
            <template>
                <authorise role="root" denied_srai="ACCESS_DENIED">
                    <vocabulary />
                </authorise>
            </template>
    </category>
</aiml>
```

éŰćéĂčéăĚçŻő: *æĽ£èł*■

6.1.3 bot

[1.0]

botèęĄçťˇäãĄŕãĂĄbotåŽžæIJĽãĄőãČŮãČ■ãČŚãČĘãĆčãĆŠåŔŰå¿ŮãĄŮãĄ¿ãĄŹãĂĆãĄŞãĄőèęĄçťˇäãĄŕèł■ãĄ£è¿ijãĄ£åŕĆçŤÍãĄ
ãČŮãČ■ãČŚãČĘãĆčãĄŕãĂĄ*propertiesãČŢãĆąãĆďãČń* ãĄğèęŘåőŽãĄŹãĆÑãĄŞãĄÍãĄğãĂĄäżżæĎŔãĄőæČÉåąśãĆŠåŽžåőŽåĂ

- åśđæĂğãĂĂïijĽå■ŘèęĄçťˇäãĄğãĄőæŇĞåőŽãĆĆåŔŕèČ¡ïijĽ

ãČŠãČľãĆąãČąãĆčãĆ£	åđŃ	å£ĚéăĹ	èłłæŸŐ
name	string	Yes	propertiesãČŢãĆąãĆďãČńãĄğèęŘåőŽãĄŮãĄ§ãĂĄãČŮãČ■ãČŚãČĘãĆčåŘ■ãĆŠæŇĞåőŽ

ãČŮãČ■ãČŚãČĘãĆčåŘ■ãĄŕåď L'æŢřåŘ■ãĄÍåŘŇãĄŸä¡■ç¡őãĄĕãĄŚãĄńãĄłãĆŃçĆžãĂĄåď ğæŰĞå■ŮãČżåřŔæŰĞå■ŮãĂĄåĚÍèğ

ãČŮãČ■ãČŚãČĘãĆčãĄńãĄŕãĂĄäżżæĎŔãĄőåŽžæIJĽåĂďäżěåď ŰãĄńãĂĄãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşåőŽç¿l'ãĆŠç¡ő

- ä¡£çŤÍä¿Ń

ãČŮãČ■ãČŚãČĘãĆčãĄÍãĄŮãĄęãĂĄnameãĂĄbirthdateãĂĄapp_versionãĂĄgrammar_versionãĄŇçŹżéŇšãĄŢãĆŇãĄęãĄĎãĆŃ

```
 <category>
    <pattern>ãĄĆãĄłãĄ§ãĄŕèłřïijŞ</pattern>
    <template>
        çğĄãĄőåŘ■åL'■ãĄŕ<bot name="name" />ãĄğãĄŹãĂĆ
        <bot name="birthdate" />çŤ§ãĄ¿ãĆŃãĄğãĄŹãĂĆ
        ãĆćãČŮãČłãĆśãČijãĆůãČğãČşãČŘãČijãĆÿãČğãČşãĄŕ<bot name="app_version" />
→ãĄğãĄŹãĂĆ
        ãĆřãČl'ãČđãČijãČŘãČijãĆÿãČğãČşãĄŕ<bot name="grammar_version" />ãĄğãĄŹãĂĆ
    </template>
</category>
```

nameåśđæĂğãĄńãĂĄçŹżéŇšãĄŢãĆŇãĄęãĄłãĄĎãČŮãČ■ãČŚãČĘãĆčåŘ■ãĆŠæŇĞåőŽãĄŮãĄ§åăť åŘĹãĂĄãĆůãČŁãČłãĆłåśŢé

botãĄőå■ŘèęĄçťˇäãĄÍãĄŮãĄęnameãĆŠåĹľçŤÍãĄŹãĆŃãĄŞãĄÍãĄğãĂĄnameåśđæĂğãĄÍåŘŇãĄŸåĘĚåőźãĆŠèÍŸèijĽãĄŹãĆŃãĄ

```
<category>
    <pattern>ãĄĆãĄłãĄ§ãĄŕèłřãĄğãĄŹãĄŃïijŞ</pattern>
    <template>
        çğĄãĄőåŘ■åL'■ãĄŕ<bot><name>name</name></bot>ãĄğãĄŹãĂĆ
        <bot><name>birthdate</name></bot>çŤ§ãĄ¿ãĆŃãĄğãĄŹãĂĆ
        ãĆćãČŮãČłãĆśãČijãĆůãČğãČşãČŘãČijãĆÿãČğãČşãĄŕ<bot><name>app_version</name></
→bot>ãĄğãĄŹãĂĆ
        ãĆřãČl'ãČđãČijãČŘãČijãĆÿãČğãČşãĄŕ<bot><name>grammar_version</name></bot>
→ãĄğãĄŹãĂĆ
    </template>
</category>
```

å■ŘèęĄçťˇäãĄőnameãĄńãĂĄçŹżéŇšãĄŢãĆŇãĄęãĄłãĄĎãČŮãČ■ãČŚãČĘãĆčåŘ■ãĆŠæŇĞåőŽãĄŮãĄ§åăť åŘĹãĂĄåő§èąŇæŹĆ
default-property ãĄőåőŽç¿l'åĂďãĄŇè£ŤãĆŁãĄ¿ãĄŹãĂĆ ïijĹdefault-propertyãĄŇåőŽç¿l'ãĄŢãĆŇãĄęãĄĎãĄłãĄĎåăť åŘĹãĂĄd
getãĄőåőŽç¿l'åĂďãĄŇè£ŤãĆŁãĄ¿ãĄŹãĂĆïijĽ

åřŽãĂĄ*properties_jsonãĆÍãČşãČĘãĆčãČĘãĆč* ãĆŠåĹľçŤÍãĄŮãĄęãĂĄãČŮãČ■ãČŚãČĘãĆčãĄőåĂďãĄńJ-
SONå¡ćåijRãĆŠæŇĞåőŽãĄŮãĄ§åăť åŘĹãĂĄåŔŰå¿ŮãĄŢãĆŇãĆŇãČĞãČijãĆ£ãĄŕãČŢãĆąãĆďãČńãĄőåĘĚåőźãĄİãĄőãĆĆãĄő
`properties_jsonãĆÍãČşãČĘãĆčãČĘãĆč` ãĄńãĂĄäżěäÿŃãĄőJSONãČŢãĆąãĆďãČńãĆŠ
âĂŸtest_json.jsonâĂŹ ãĄÍãĄŮãĄęéĚ■ç¡őãĄŮãĄ§åăť åŘĹãĂĄ

```
{
  "key1": "value1",
  "key2":
    {
      "key2_1": "value2_1"
    }
}
```

`<bot name="test_json" />` ãĄğåŔŰå¿ŮãĄŢãĆŇãĆŇåĂď ãĄŕãĂĄäżěäýŃãĄńæğŸãĄńçůÍéŽĘãĄŢãĆŇãĄ§æŰĞå■ŮåĹŮã

```
{"key1": "value1", "key2": {"key2_1": "value2_1"}}
```

éŰćéĂčéãĚçŻő: *ãČŢãĆąãĆďãČńçőąçŘĘïijŽproperties*

6.1.4 button

[2.1]

buttonèęĄçťăãĄŕãĂĄäijŽèľśäÿ■ãĄńãČęãČijãĆűãĄńãĆ£ãČČãČŮãĆŠä£ČãĄŹçŤÍéĂŤãĄğåĹľçŤÍãĄŢãĆŇãĆŇãČłãČČãČĄãČąãČ
å■ŘèęĄçťăãĄÍãĄŮãĄęãĂĄbuttonãĄőèąĺèÍŸãĄńä¡£çŤÍãĄŹãĆŇãČĘãĆ■ãĆźãČĹãĂĄBotãĄńåŕ¿ãĄŹãĆŇpostbackãĂĄãČIJãĆ£ãČ

åŕ¿èľ śãĆÍãČşãĆÿãČşãĄğãĄŕãĂĄãČłãČČãČĄãČąãČĞãĆčãĆćèęĄçťăãĄńåŕ¿ãĄŮãĄęãĂĄXMLå¡ćåijŔãĄőçţŘæđIJãĆŠè£ŤãĄŮãĄ
åő§éŽŽãĄőçŤżéİćæŘŘçŤżç■Ľ ãĄŕãĂĄãĆşãĆşãČŢãĆčãĆŕãČňãČijãĆůãČğãĆşåőŽç¿ľãĄőclientãĄő *renderer* ãĄğæŇĞåőŽãĄŮãĄ§åĞęçŘĘãĆŕãČľãĆźãĄőåĹűå¿ąãĄńä¿İå■ŸãĄŮãĄ¿ãĄŹãĂĆ

- å■ŘèęĄçťăãĂĂïijĹåśđæĂğãĄğãĄőæŇĞåőŽãĆĆåŔŕèČ¡ïijĽ

ãČŠãČŀãČąãČijãĆ£	åđŃ	å£Ěé ăĹ	æŸŐ
text	string	Yes	ãČIJãĆ£ãČşãĄńèąĺçďžãĄŹãĆŇãČĘãĆ■ãĆźãČĹãĆŠèÍŸèijĽãĄŮãĄ¿ãĄŹãĂĆïijĹçľžæŰĞå■ŮãĆŠèÍ
postback	string	No	ãČIJãĆ£ãČşæŁijäÿŃæŹĆãĄőåŇŢä¡IJãĆŠèÍŸèijĽãĄŮãĄ¿ãĄŹãĂĆãČęãČijãĆűãĄńãĄŕãĄŞãĄőãČą
url	string	No	ãČIJãĆ£ãČşæŁijäÿŃæŹĆãĄőURLãĆŠèÍŸèijĽãĄŮãĄ¿ãĄŹãĂĆ

- ä¡£çŤÍä¿Ń

```
<category>
    <pattern>äźŮãĆŁæŔŻãĄĹ</pattern>
    <template>
         <button>
             <text>äźŮãĆŁæŔŻãĄĹæď'IJçť'ćãĄŮãĄ¿ãĄŹãĄŃïijŞ</text>
             <postback>äźŮãĆŁæŔŻãĄĹæąĹåĘĚ</postback>
         </button>
    </template>
 </category>

<category>
    <pattern>æď'IJçť'ć</pattern>
    <template>
         <button>
             <text>æď'IJçť'ćãĄŮãĄ¿ãĄŹãĄŃïijŞ</text>
             <url>https://searchsite.com</url>
         </button>
    </template>
 </category>
```

6.1.5 card

[2.1]

cardèęĄçťăãĄŕãČłãČČãČĄãČąãČĞãĆčãĆćèęĄçťăãĄğãĂĄçŤżåČŔãĂĄãČIJãĆ£ãČşãĂĄãĆ£ãĆďãČĹãČńãĂĄãĆţãČŰãĆ£ãĆďãČ
ãĄŞãĆŇãĆĽãĄőãČłãČČãČĄãČąãČĞãĆčãĆćèęĄçťăãĄŹãĄźãĄęãĆŠåŘńãĆĂãČąãČŇãČĕãČijãĄŃèąĺçďžãĄŢãĆŇãĄ¿ãĄŹãĂĆ

åŕ¿èľśãĆĺãČşãĆÿãČşãĄğãĄŕãĂĄãČłãČČãČąãČąãČĞãĆčãĆćèęĄçť ăãĄńåŕ¿ãĄŮãĄęãĂĄXMLå¡ćåijŔãĄőçţŘæđIJãĆŠè£ŤãĄŮãĄ
åő§éŽŽãĄőçŤżéÍćæŔŔçŤżç■Ľ ãĄŕãĂĄãĆşãČşãČŢãĆčãĆŕãČńãČijãĆůãČğãČşåőŽç¿ľ ãĄőclientãĄő *renderer*
ãĄğæŇĞåőŽãĄŮãĄ§åĞęçŘĘãĆŕãČľ ãĆźãĄőåĹűå¿ąãĄńä¿Ìå■ŸãĄŮãĄ¿ãĄŹãĂĆ

- å■ŘèęĄçť ăãĂĂïijĹåśđæĂğãĄğãĄőæŇĞåőŽãĆĆåŔŕèČ¡ïijĽ

ãČŚãČľãĆąãĆćãĆjãĆčãĄ£ĽéëĺĭæŸŐ			
title	string	Yes	ãĆńãČijãČĽãĄőãĆ£ãĆd'ãČĹãČńãĆŠèĺŸèijĽãĄŮãĄ¿ãĄŹãĂĆïijĹçľžæŰĞå■ŮãĆŠèĺśåőźãĄŮãĄ¿ãĄ
subtitle	string	No	ãĆńãČijãČĽãĄńåŕ¿ãĄŹãĆŃè£¡åŁăæČĚåăśãĆŠèĺŸèijĽãĄŮãĄ¿ãĄŹãĂĆ
image	string	Yes	ãĆńãČijãČĽçŤĺãĄőçŤżåČŔURLç■Ľ ãĆŠèĺŸèijĽãĄŮãĄ¿ãĄŹãĂĆïijĹçľžæŰĞå■ŮãĆŠèĺśåőźãĄŮãĄ
button	string	Yes	ãĆńãČijãČĽçŤĺãĄőãČIJãĆ£ãČşæČĚåăśãĆŠèĺŸèijĽãĄŮãĄ¿ãĄŹãĂĆ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>æd'IJçt'ć</pattern>
    <template>
        <card>
            <title>ãĆńãČijãČL'ãČąãČŃãČěãČij</title>
            <subtitle>ãĆńãČijãČL'ãČąãČŃãČěãČijèl'şçt'ŕæČĚåăś</subtitle>
            <image>https://searchsite.com/image.png</image>
            <button>
                <text>æd'IJçt'ćãĄŮãĄ¿ãĄŹãĄŃïij§</text>
                <url>https://searchsite.com</url>
            </button>
        </card>
    </template>
</category>
```

éŰćéĂčéăĚçŻő: *button*, *image*

6.1.6 carousel

[2.1]

carouselèęĄçť ăãĄŕãČłãČČãČąãČąãČĞãĆčãĆćèęĄçť ăãĄğãĂĄãĆńãČijãČL'èęĄçť ăãĆŠèd'ĞæŢŕåĹľçŤĺãĄŮãĆ£ãČČãČŮãĆźãČńã
ãĄŞãĆŇãĆL'ãĄőãČłãČČãČąãČąãČĞãĆčãĆćèęĄçť ăãĄŹãĄźãĄęãĆŠåŘńãĆĂãČąãČŃãČěãČijãĄŇèąĺçd'žãĄŢãĆŇãĄ¿ãĄŹãĂĆ

åŕ¿èľśãĆĺãČşãĆÿãČşãĄğãĄŕãĂĄãČłãČČãČąãČąãČĞãĆčãĆćèęĄçť ăãĄńåŕ¿ãĄŮãĄęãĂĄXMLå¡ćåijŔãĄőçţŘæđIJãĆŠè£ŤãĄŮãĄ
åő§éŽŽãĄőçŤżéÍćæŔŔçŤżç■Ľ ãĄŕãĂĄãĆşãČşãČŢãĆčãĆŕãČńãČijãĆůãČğãČşåőŽç¿ľ ãĄőclientãĄő *renderer*
ãĄğæŇĞåőŽãĄŮãĄ§åĞęçŘĘãĆŕãČľ ãĆźãĄőåĹűå¿ąãĄńä¿Ìå■ŸãĄŮãĄ¿ãĄŹãĂĆ

- å■ŘèęĄçť ă

ãČŚãČľãĆąãĆćãĆjãĆčãĄ£ĽéëĺĭæŸŐ			
card	string	Yes	èd'ĞæŢŕãĄőãĆńãČijãČĽãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆäÿÅåžęãĄńãĆńãČijãČĽãĆŠ1ãĄd'èąĺçd'žãĂ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>ãČńãĆźãČĹãČl'ãČşæd'IJçt'ć</pattern>
    <template>
        <carousel>
            <card>
                <title>ãĆd'ãĆ£ãČłãĆćãČş</title>
                <subtitle>ãĆd'ãĆ£ãČłãĆćæŰŹçŘĘåžŮãĄőæd'IJçt'ć</subtitle>
                <image>https://searchsite.com?q=italian</image>
                <button>ãĆd'ãĆ£ãČłãĆćãČşæd'IJçt'ć</button>
            </card>
            <card>
```

(continues on next page)

(continued from previous page)

```
                <title>ãČŢãČňãČşãČĄ</title>
                <subtitle>ãČŢãČl'ãČşãĆźæŰŹçŘĘåžŮãĄőæd'IJçt'ć</subtitle>
                <image>https://searchsite.com?q=french</image>
                <button>ãČŢãČňãČşãČĄæd'IJçt'ć</button>
            </card>
        </carousel>
    </template>
</category>
```

éŰćéĂčéäĚçŻő: *card*, *button*, *image*

6.1.7 condition

[1.0]

conditionèęĄçt'ăăĄŕãĂĄtemplateåĘĚãĄgãĄőæİąäżűåĹd'æŰ■ãĆŠèąŇãĄĘéŽŻãĄńä¡£çŢĺĺãĄŮãĂĄswitch-caseãĄõãĆĹãĄĘãĄłåĞęçŘĘãĆŠèĺŸèijL'ãĄgãĄ■ãĄ¿ãĄŹãĂĆ

conditionãĄőåśđæĂğãČżå■ŘèęĄçt'ăăĄgæŇĞåőŽãĄŮãĄ§åd'L'æŢřãĄĺåĹd'åőŽåĂd'ãĄőçţĎãĄ£åŘĹãĆŔãĄŻãĄgæİąäżűåĹd'åőŽãČ
å■ŘèęĄçt'ăăĆŠä¡£çŢĺĺãĄŹãĆŃãĄŞãĄĺãĄgèd'ĞæŢřãĄőæİąäżűãĆŠåĹŮèĺŸãĄŹãĆŃãĄŞãĄĺãĄŇãĄgãĄ■ãĄ¿ãĄŹãĂĆ

åŕ¿èśąåd'L'æŢřãĄńãĄŕãĂĄget/setãĄgåőŽç¿l'ãĄŮãĄ§ãĆřãČ■ãČijãČŘãČńåd'L'æŢřãĂĄãČ■ãČijãĆńãČńåd'L'æŢřãĄĺãĄĺãĆĆãĄńãĄ

- åśđæĂğ

ãČŚãČľãČąãČţãČaãČijãČĚãČĘãČĚéäĺĭæŸŐ			
name	åd'L'æŢřåŘ■o		åĹĘåšŘæİąäżűãĄĺãĄŹãĆŃãĆřãČ■ãČijãČŘãČńåd'L'æŢř(name)åŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
var	åd'L'æŢřåŘ■o		åĹĘåšŘæİąäżűãĄĺãĄŹãĆŃãČ■ãČijãĆńãČńåd'L'æŢř(var)åŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
data	åd'L'æŢřåŘ■o		åĹĘåšŘæİąäżűãĄĺãĄŹãĆŃãĆřãČ■ãČijãČŘãČńåd'L'æŢř(data)åŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
bot	ãČŮãČ■ãČŠãČĘãČĚãŘ■		æİąäżűãĄĺãĄŹãĆŃBotåŽžæIJL'æČĚåăšïijĹãČŮãČ■ãČŠãČĘãĆčïijL'åŘ■ãĆŠæŇĞåőŽãĄŮãĄ
value	åĹd'åőŽåĂŇo		åĹĘåšŘæİąäżűãĄĺãĄŁãĆŃåĂd'ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆïijĹåd'ğæŰĞå■ŮãČžåřŔæŰĞå■ŮãĂĄ
regex	åĹd'åőŽåĂŇo		åĹĘåšŘæİąäżűãĄĺãĄŁãĆŃåĂd'ãĆŠæ■čèęŔèąĺçŔ¿ãĄgæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆåĹd'åőŽãĄŕåőŇåĚĺã

- å■ŘèęĄçt'ă

ãČŚãČľãČąãČţãČaãČijãČĚãČĘãČĚéäĺĭæŸŐ			
li	string	No	æŇĞåőŽãĄŮãĄ§åd'L'æŢřãĄńåŕ¿ãĄŹãĆŃåĹĘåšŘæİąäżűãĆŠèĺŸèijL'ãĄŮãĄ¿ãĄŹãĂĆ

ãĂĂåśđæĂğãĄőåŘĎãĆŚãČľãČąãČijãĆ£ãĆĆå■ŘèęĄçt'ăăĄĺãĄŮãĄęæŇĞåőŽãĄgãĄ■ãĄ¿ãĄŹãĂĆ

conditionèęĄçt'ăăĄńãĄŕãĂĄåd'L'æŢřãĄĺåĹd'åőŽåĂd'ãĄőèĺŸèijL'æŰźæşŢãĄńãĆĹãĆŁãĂĄæňąãĄőïijŞãĄd'ãĄőåĞęçŘĘæŰźåijŘ

- å■ŸäÿĂåĹd'åőŽïijŽ `li` å■ŘèęĄçt'ăăĆŠä¡£çŢĺĺãĄŽãĄŽãĄńãĂĄïijŚãĄd'ãĄőåd'L'æŢřãĄĺåĹd'åőŽåĂd'ãĄőçţĎãĄ£åŘĹãĆŔãĄ
- æİąäżűåĹĘåšŘïijŽ condition ãĄĺãĄŮãĄęåŕ¿èśąãĄĺãĄŹãĆŃïijŚãĄd'ãĄőåd'L'æŢřãĆŠèęŔåőŽãĄŮãĄĂ`li` å■ŘèęĄçt'ăæŕŐãĄńåĹd'åőŽåĂd'ãĆŠæŇĞåőŽãĄŹãĆŃãĄŞãĄĺãĄgãĂęd'ĞæŢřãĄőæİąäżűãĄńåŕ¿å£IJãĄŮãĄ¿ãĄŹãĂĆ
- èd'ĞæŢřæİąäżűãĄgãĄőåĹĘåšŘïijŽ `li` å■ŘèęĄçt'ăæŕŐãĄńåd'L'æŢřãĄĺåĹd'åőŽåĂd'ãĄőçţĎãĄ£åŘĹãĆŔãĄŻãĆŠæŇĞåőŽã

ãĄŞãĄőïijŞãĄd'ãĄőåĞęçŘĘæŰźåijŔãĄĺãĄŕçŢřãĄłãĆŃèĺŸèijL'æŰźæşŢãĄőåăt'åŘĹãĄńãĄŕãĂĄãĆůãČŁãČłãĆłåśŢéŰŃæŹĆãĄń

ïijĹäÿ■æ■čä¿ŃïijŽåd'L'æŢřãĄĺåĹd'åőŽåĂd'ãĄőçţĎãĄ£åŘĹãĆŔãĄŻãĄŇæĹŘçńŇãĄŮãĄłãĄĐåăt'åŘĹãĆĎãĂĄâŹconditionâŹ

äžĕäÿÑãĄńãĂĄåŘĎæŰźåijŔãĄgãĄőconditionãĄőèÍŸèijL'æŰźæşŢãĆŠèłñæŸŐãĄŮãĄ¿ãĄŹãĂĆ

å■ŸäÿĂåĹď åőŽ

conditionèęAçt'ăãAĺãĄŮãĄęãĂąïijŚãAd'ãĄőåd'L'æŢřãAĺåĹd'åőŽåĂd'ãĄőçţĎãĄ£åŘĹãĆŔãĄŽãĆŠæŇĞåőŽãĄŹãĆŃæŰźåijŔãĄ

ãĄŞãĄőèÍŸèijL'æŰźæşŢãĄŕãĂĄåd'L'æŢřåĂd'ãĄőåĹd'åőŽçţŘæđIJãĄŇtrueãĄőåät'åŘĹãĄńèęAçt'ăãĄőæŰĞå■ŮåĹŮãĆŠè£ŤãĄŮ

äžĕäÿÑãĄőä¡£çŤĺä¿ÑãĄőæğŸãĄń4çĺőéąđãĄőèÍŸèijL'æŰźæşŢãĄŇãĄĆãĆŁãĂąãĄĎãĄŽãĆŇãĆĆåŘŇãĄŸåŃŢä¡IJãĆŠçd'žãĄŮã

- ä¡£çŤĺä¿Ń

```
<condition name="ãČŽãČČãČĹ" value="çŁň">çğĄãĆĆçŁňæt'¿ãĄğãĄŹ</condition>
<condition name="ãČŽãČČãČĹ"><value>çŁň</value>çğĄãĆĆçŁňæt'¿ãĄğãĄŹ</condition>
<condition value="çŁň"><name>ãČŽãČČãČĹ</name>çğĄãĆĆçŁňæt'¿ãĄğãĄŹ</condition>
<condition><name>ãČŽãČČãČĹ</name><value>çŁň</value>çğĄãĆĆçŁňæt'¿ãĄğãĄŹ</condition>
```

nameåd'L'æŢřijŽâĂÍãČŽãČČãČĹâĂÍãĄőåĂd'ãĄŇâĂÍçŁňâĂÍãĄgãĄĆãĄčãĄ§åät'åŘĹãĂĄâĂÍçğĄãĆĆçŁňæt'¿ãĄğãĄŹâĂÍãĆŠè

æÍąäžűåĹĘåšŘ

condition ãĄőåśđæĂğãČżå■ŘèęAçt'ăãĄğïijŚãAd'ãĄőåd'L'æŢřãĆŠèÍ■åőŽãĄŮãĂĄ `li`
å■ŘèęAçt'ăãĄğår¿èśąãĄĺãĄłãĆŃåĂd'ãĄńår¿ãĄŹãĆŃåĹĘåšŘãĆŠèÍŸè£řãĄŮãĄ¿ãĄŹãĂĆåĹĘåšŘæŰźæşŢãĄŕswitch-caseãĄńäijjãĄęãĄĎãĄ¿ãĄŹãĂĆ
condition ãĄőåd'L'æŢřãĄőåĘĚåőźãĆŠ `li`
å■ŘèęAçt'ăãĄőåĹd'åőŽåĂd'ãĄÍærŤèijČãĄŮãĂĄtrueãĄńãĄłãĄčãĄ§æÍąäžűãĄőåĘĚåőźãĆŠè£ŤãĄŮãĄ¿ãĄŹãĂĆ
åĹĘåšŘæÍąäžűãĄńåŘĹèĞt'ãĄŮãĄłãĄĎåät'åŘĹãĂĄåĹd'åőŽåĂd'ãĄŇæŇĞåőŽãĄŢãĆŇãĄęãĄĎãĄłãĄĎ `li`
å■ŘèęAçt'ăãĄőåĘĚåőźãĆŠè£ŤãĄŮãĄ¿ãĄŹãĂĆåĹd'åőŽåĂd'ãĄŇæŇĞåőŽãĄŢãĆŇãĄęãĄĎãĄłãĄĎ `li`
å■ŘèęAçt'ăãĄŇãĄłãĄĎåät'åŘĹãĄŕãĂĄä¡ŢãĆĆè£ŤãĄŮãĄ¿ãĄŹãĆŞãĂĆ

äžĕäÿÑãĄőä¡£çŤĺä¿ÑãĄgãĄŕãĂĄnameåd'L'æŢřijŽâĂÍãČŽãČČãČĹâĂÍãĄőåĂd'ãĆŠèl'Ţä¿ąãĄŮãĄ¿ãĄŹãĂĆèl'Ţä¿ąãĄőåĎłåĚĹé

- ä¡£çŤĺä¿Ń

```
<condition name="ãČŽãČČãČĹ">
    <li value="çŁň">çğĄãĆĆçŁňæt'¿ãĄğãĄŹ</li>
    <li value="çŇń">çŇńãĄŇäÿĂçŢłåě¡ãĄ■ãĄğãĄŹ</li>
    <li>ãČŽãČČãČĹãĄŕéčijãĄčãĄęãĄłãĄĎãĄğãĄŹ</li>
</condition>

<condition>
    <name>ãČŽãČČãČĹ</name>
    <li value="çŁň">çğĄãĆĆçŁňæt'¿ãĄğãĄŹ</li>
    <li value="çŇń">çŇńãĄŇäÿĂçŢłåě¡ãĄ■ãĄğãĄŹ</li>
    <li>ãČŽãČČãČĹãĄŕéčijãĄčãĄęãĄłãĄĎãĄğãĄŹ</li>
</condition>
```

èď ĞæŢřæÍąäžűãĄgãĄőåĹĘåšŘ

`li`
å■ŘèęAçt'ăæfŐãĄńæÍąäžűåĹĘåšŘãĆŠæŇĞåőŽãĄŹãĆŃåät'åŘĹãĄőèÍŸèijL'æŰźæşŢãĄgãĂĄåĹĘåšŘæŰźæşŢãĄŕifæŰĞãĄőéŽĘå
`li` å■ŘèęAçt'ăãĄgåőŽç¿l'ãĄŢãĆŃãĄ§åŘĎæÍąäžűãĄŇéãĘæňąãČãĄĆgãČČãĆŕãĄŢãĆŃãĄ¿ãĄŹãĂĆåŘĎ''li''
å■ŘèęAçt'ăãĄgãĄŕçŢřãĄłãĆŃåd'L'æŢřãĂĄåĹd'åőŽåĂd'ãĆŠæŇĄãĄd'ãĄŞãĄĺãĄŇãĄgãĄ■ãĄ¿ãĄŹãĂĆ

æÌąäżűãĄŇtrueãĄńãĄłãĆŇãĄÍãĄÌãĄőæŹĆçĆźãĄğèľŢä¿ąãĄŇåőŇäžĘãĄŮãĂĄèľšå¡ŞãĄŹãĆŇ `li` å■ŘèęĄçťăăĄőåĘĚåőźãĆŠè£ŤãĄŮãĄ¿ãĄŹãĂĆ

äżěäÿŇãĄőä¡£çŤĺä¿ŃãĄğãĄŕãĂĄnameåď˙L˙æŢřïijŽâĂÌãČŽãČČãČĹâĂÌãĄÍãĂĄnameåď˙L˙æŢřïijŽâĂÌéčšãĄ£çL˙l˙âĂÌãĄőåÅď˙ãĆŠ

- ä¡£çŤĺä¿Ń

```
<condition>
    <li name="ãČŽãČČãČĹ" value="çŁň">çğĄãĆĆçŁňæt’¿ãĄğãĄŹ</li>
    <li value="çŇń"><name>ãČŽãČČãČĹ</name>çŇńãĄŇäÿĂçŢłåě¡ãĄ■ãĄğãĄŹ</li>
    <li name="éčšãĄ£çL’l’"><value>ãĆşãČijãČŠãČij</value>
↪ãČđãČşãČĞãČłãČşãĄŇãĄĐãĄĐãĄğãĄŹ</li>
    <li><name>éčšãĄ£çL’l’</name><value>çt’ĚèŇű</value>
↪ãĆćãČijãČńãĆřãČńãĆd’ãĄŇåě¡ãĄ■ãĄğãĄŹ</li>
    <li>åě¡ãĄ■ãĄłãĆĆãĄőãĄŕãĄĆãĆŁãĄ¿ãĄŹãĄŃ</li>
</condition>
```

ãČńãČijãČŮåĞęçŘĘ

æÌąäżűãĄńãĆĹãĆŁconditionåĞęçŘĘãĆŠçźřãĆŁè£ŤãĄŹåät’åŘĹãĂĄ`<loop />` ãĆŠ `li` ãĄőå■ŘèęĄçť˙ăãĄÍãĄŮãĄęèÍŸèijL˙ãĄŮãĄ¿ãĄŹãĂĆ

éĂŽåÿÿ<li>ãĄğåĹĘåšŘãĄŮãĄ§åät’åŘĹãĂĄåĞęçŘĘåĘĚåőźãĆŠ<template>ãĄÍãĄŮãĄęè£ŤãĄŮãĄ¿ãĄŹãĄŃãĂĄâĂŹ<loop />âĂŹãĄŃãĄĆãĆŃåät’åŘĹãĂĄår¿èśąãĄÍãĄłãĆŃ<li>ãĄńåĹĘåšŘãĄŮãĂĄ<li>ãĄőåĞęçŘĘãĆŠçţĆãĄĹãĄ§å¿ŃãĂĄ<condition>ã

åřŽãĂĄïijŚãĄd’ãĄőconditionèęĄçť˙ååĘĚãĄğåő§æŰ¡ãĄğãĄ■ãĆŃãČńãČijãČŮåĞęçŘĘãĄőåŽđæŢřãĄŕãĂĄãĆşãČşãČŢãĆčãĆřãČr
åĹűéŹŘåĂd’åőŽç¿l’ ãĄő `max_search_condition` ãĄ¿ãĄğãĄÍãĄłãĆĹãĄ¿ãĄŹãĂĆ

åĹűéŹŘæŢřãĆŠèűĚãĄĹãĄęãČńãČijãČŮåĞęçŘĘãĆŠèąŇãĄčãĄ§åät’åŘĹãĂĄåĞęçŘĘä¿Ńåd’ŰãĄŇçŹžçŢ§ãĄŮãĄ¿ãĄŹãĂĆ

äżěäÿŇãĄőä¡£çŤĺä¿ŃãĄğãĄŕãĂĄåd’L˙æŢřâĂÌèl’śéąŇâĂÌãĆŠèl’Ţä¿ąãĄŮãĄęè£ŤãĄŹåĘĚåőźãĆŠæśžåőŽãĄŮãĄ¿ãĄŹãĄŃãĂĄåĹ

- ä¡£çŤĺä¿Ń

```
<condition var="èl’śéąŇ">
    <li value="èŁś">èŁśãĄŕä¡ŢãĄŇåě¡ãĄ■ãĄğãĄŹãĄŃ</li>
    <li value="éčšãĄ£çL’l’">ãĆşãČijãČŠãČijãĄŕãĄl’ãĄĘãĄğãĄŹãĄŃ</li>
    <li value="éŻŚèńĞ">ä¡ŢãĄŃãĄĐãĄĐãĄŞãĄÍãĄĆãĆŁãĄ¿ãĄŮãĄ§ïij§</li>
    <li><think><set var="èl’śéąŇ">éŻŚèńĞ</set></think><loop /></li>
</condition>
```

éŰćéĂčéăĚçŻő: *li*, *get*, *set*, *bot*

6.1.8 date

[1.0]

dateèęĄçť˙ăãĄŕãĂĄæŮěäżŸãĄÍæŹĆåĹżãĄőæŰĞå■ŮåĹŮãĆŠåŔŰå¿ŮãĄŮãĄ¿ãĄŹãĂĆå§žæžŰåÅď˙ãĄŕãĆůãĆźãČĘãČããĄőçŔ¿ã
ãĄğãĂĄlocale/timeãĄŇæŇĞåőŽãĄŢãĆŇãĄęãĄĐãĆŃåät’åŘĹãĂĄè£ŤãĄŹåĘĚåőźãĄŕæňąãĄőæğŸãĄńåď˙L˙åŇŰãĄŮãĄ¿ãĄŹãĂĆ

- localeãĆŠæŇĞåőŽïijŽãĂĂåŽ¡ãĆşãČijãČL˙ãĆŠåĚČãĄńãĂĄèl’šå¡ŞãĄŹãĆŃåIJŕå§§ãĄőæŮěæŹĆãĄÿãĄőæŔŽçőŮãĆŠèąŇã
- timeãĆŠæŇĞåőŽïijŽãĂĂæŇĞåőŽãĄŢãĆŇãĄ§æŮěæŹĆãĆŠå§žæžŰåÅď˙ãĄÍãĄŮãĄęåĞęçŘĘãĄŮãĄ¿ãĄŹãĂĆ

æŮěäżŸãČżæŹĆåĹżãĄőåĞžåŁŽå¡ćåijŔãĄőæŇĞåőŽãĄńãĄŕãĂĄPythonãĄőæŮěæŹĆæŰĞå■ŮåĹŮãĄőæŽÿåijŔãĆŠä¡£çŤĺãĄŮãĄ
èl’şçt’řãĄŕ PythonãĄőãČđãČŇãČěãĆćãČń(datetime)ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăãĄŢãĄĐãĂĆ

- åśđæĂğãĂĂïijĹå■ŘèęĄçť˙ăãĄğãĄőæŇĞåőŽãĆĆåŔŕèČ¡ïijL˙

ãČŚãČľãČãČąãČťå£ĔéáĺňæŸŐ			
format	string	No	åĞžåŁŻå¡ćäijŔæŇĞåőŽãĂĆæIJłæŇĞåőŽæŹĆãĄŕ âĂŸ%câĂŹ

formatãĄőæŇĞåőŽãĄŇäÿ■æ■čãĄłåäť åŘĹãĄńãĄŕãĂĄçţŘæđIJãĄńãĄŕformatãĄğæŇĞåőŽãĄŢãĆŇãĄ§æŰĞå■ŮåĹŮãĄŇãĄİãĄ

- ä¡£çŤÍä¿Ń

```
<category>
    <pattern>äżŁæŮěãĄŕä¡ŢæŮěãĄğãĄŹãĄŃ</pattern>
    <template>
        äżŁæŮěãĄŕ<date format="%Y/%m/%d" />ãĄğãĄŹãĂĆ
    </template>
</category>

<category>
    <pattern>äżŁæŮěãĄŕä¡ŢæŮěãĄğãĄŹãĄŃ</pattern>
    <template>
        äżŁæŮěãĄŕ<date><format>%Y/%m/%d</format></date>ãĄğãĄŹãĂĆ
    </template>
</category>
```

éŰćéĂčéăĚçŻő: *interval*

6.1.9 delay

[2.1]

delayèęAçť ăãĄŕãČłãČČãČĄãČąãČĞãĆčãĆćèęAçť ăãĄğãĂĄéĄĚåżűãĆŠèąŇãĄĘèęAçť ăãĄğãĄŹãĂĆ
é§şåčřåŘĹæĹŘãĄőåĘ■çŤ§äÿ■ãĄłãĄľãĄőå¿ĚãĄąæŹĆéŰŞãĄőåőŽç¿l'ãĆŠèąŇãĄčãĄ§ãĆŁãĂĄãČęãČijãĆűãĄńåŕ¿ãĄŹãĆŃBotãĄ

åŕ¿èľ'śãĆÍãČşãĆÿãČşãĄğãĄŕãĂĄãČłãČČãČĄãČąãČĞãĆčãĆćèęAçť ăãĄńåŕ¿ãĄŮãĄęãĂĄXMLå¡ćäijŔãĄőçţŘæđIJãĆŠè£ŤãĄŮãĄ
åő§éŽŽãĄőçŤźéÍćæŘŘçŤżç■Ľ ãĄŕãĂĄãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşåőŽç¿l'ãĄőclientãĄő *renderer*
ãĄğæŇĞåőŽãĄŮãĄ§åĞęçŘĘãĆŕãČľ ãĆźãĄőåĹűå¿ąãĄńä¿İå■ŸãĄŮãĄ¿ãĄŹãĂĆ

- å■ŘèęAçť ăãĂïijĹåśđæĂğãĄğãĄőæŇĞåőŽãĆĆåŔŕèČ¡ïijĽ

ãČŚãČľãČãČąãČťå£ĔéáĺňæŸŐ			
seconds	stringïijĹæŤřåĂďïijĽ	Yes	éĄĚåżűçğŠæŢřãĆŠæŇĞåőŽãĂĆ

secondsãĄńæŢřåĂď äżěåď ŰãĆŠæŇĞåőŽãĄŮãĄ§åäť åŘĹãĂĄåśđæĂğæŇĞåőŽãĄğãĄŕèľ'śå¡ŞãĆůãČŁãČłãĆłãĄŇçĎąåŁźãĄńãĄ
âĂIJ0âĂİ ãĄŇèÍ■åőŽãĄŢãĆŇãĄ¿ãĄŹãĂĆ

- ä¡£çŤÍä¿Ń

```
<category>
    <pattern>* çğŠå¿ĚãĄčãĄę</pattern>
    <template>
         <delay>
             <seconds><star/></seconds>
         </delay>
     </template>
 </category>
```

6.1.10 deletetriple

[2.0]

deletetripleèçĄçt'ăăĄŕăĂĄRDFăČŁăČňăČČăĆÿăČŹăČijăĆźăĄŃăĆĽăĆÍăČňăČąăČşăČĹăĆŠåĽŁéŽd'ăĄŮăĄ¿ăĄŹăĂĆ

æŇĞåőŽăĄğăĄ■ăĆŇăĆÍăČňăČąăČşăČĹăĄŕèţůåŃŢæŹĆăĄńRDFăČŢăĆąăĆd'ăČńăĄŃăĆĽèł■ăĄ£è¿ijăĄ¿ăĆŇăĄ§ăĆÍăČňăČąăČş
addtriple ăĄğè£¡åŁăăĄŢăĆŇăĄ§ăĆÍăČňăČąăČşăČĹăĄğăĄŹăĂĆ
deletetripleèçĄçt'ăăĄőçţŘæđIJæŰĞå■ŮåĹŮăĄŕăĂĄåÿÿăĄńçľ'žæŰĞå■ŮăĄńăĄłăĆŁăĄ¿ăĄŹăĂĆ
èľşçt'řăĄŕăĂĄ*RDFăĆţăČÍăČijăČĹ* ăĆŠåŔĆçĚğăĄŮăĄęăĄŔăĄăăĄŢăĄĎăĂĆ

- å■ŘèçĄçt'ă

ăČŠăČľăČąăČijăĆ£	ăĆ£ăĆďăČŮ	å£Ěéăĺ	æŸŐ
subj	string	Yes	åĽŁéŽd'åŕ¿èśąăĄősubject (äÿżèłđ)ăĄőåĂď
pred	string	No	åĽŁéŽd'åŕ¿èśąăĄőpredicate (è£řèłđ)ăĄőåĂď
obj	string	No	åĽŁéŽd'åŕ¿èśąăĄőobject (çŻőçŽĎèłđ)ăĄőåĂď

æŇĞåőŽăĄŢăĆŇăĄ§åĂď'ăĄŕçţśäÿĂăĆşăČijăČĽïijĹèŃśæŢřèÍŸåŔůïijŽå■ŁèğŠăĂĄăĆńăĆ£ăĆńăČŁïijŽåĚÍèğŠïijĽăĄńåďĽæŔŻă

objæŇĞåőŽăĆŠçIJĄçŢěăĄŮăĄ§åăť'åŔĹăĂĄsubjăĄÍpredăĄŃäÿĂèĞt'ăĄŹăĆŇăĆĆăĄőăĄŃåĽŁéŽd'ăĄŢăĆŇăĂĄpred/objăĄőæŇ

- ä¡£çŤÍä¿Ń

```
<category>
    <pattern>* ăĄŕ * ăĆŠåL'ŁéŽd'</pattern>
    <template>
        <deletetriple>
            <subj><star /></subj>
            <pred>ăĄŕ</pred>
            <obj><star index="2"/></obj>
        </deletetriple>
        åL'ŁéŽd'ăĄŮăĄ¿ăĄŮăĄ§
    </template>
</category>
```

éŰćéĂčéăĚçŽő: *addtriple*, *select*, *uniq*, *RDFăĆţăČÍăČijăČĹ*

6.1.11 denormalize

[1.0]

normalizeèçĄçt'ăăĄŃåŕ¿èśąæŰĞå■ŮåĹŮăĄńåŘńăĄ¿ăĆŇăĆŇèÍŸåŔůăĆĎç§■çÿőå¡ćăĄőæŰĞå■ŮåĹŮăĆŠå■ŸèłđăĄńåď'ĽæŔŻă
åď'ĽæŔŻåĘĚåőźăĄŕăĂĄ*denormalăČŢăĆąăĆd'ăČń*
ăĄğæŇĞåőŽăĄŮăĂĄåď'ğæŰĞå■ŮăČżåřŔæŰĞå■ŮăĂĄåĚÍèğŠăČżå■ŁèğŠăĆŠåŇžåĹĕăĄŮăĄęåď'ĽæŔŻăĆŠèąŇăĄĎăĄ¿ăĄŹăĂĆ

ä¿ŃăĄĹăĄŕăĂĄâĂŽwww.***.comâĂŽăĄńåŕ¿ăĄŮăĄęăĂĄnormalizeăĄğâĂŽ.âĂŽăĆŠâĂŽdotâĂŽăĂĄâĂŽ*âĂŽăĆŠâĂŽ_âĂŽă
dot _ _ _ dot com âĂŸăĄńăĄłăĆŁăĄ¿ăĄŹăĄŃăĂĄ

denormalizeăĄğâĂŽdotâĂŽăĆŠâĂŽ.âĂŽăĂĄâĂŽ_âĂŽăĆŠâĂŽ*âĂŽăĄńåď'ĽæŔŻăĄŹăĆŇăĆĹăĄĘăĄńæŇĞåőŽăĄŮăĄ§åăť'åŘ

èŃśæŰĞăĄőåăť'åŘĹăĂĄnormalizeăĄőåď'ĽæŔŻçţŘæđIJăĄńăĄŕå£ĚăĄŽåĽ■ä¿ŃăĄńçľ'žçŹ¡ăĄŃæŇ£åĚěăĄŢăĆŇăĄęăĄĎăĆŃçĆ

- ä¡£çŤÍä¿Ń

```
<category>
    <pattern>URLãĄŕ * ãĄğãĄŹãĂĆ</pattern>
    <template>
        <think>
            <set var="url"><normalize><star /></normalize></set>
        </think>
        <denormalize><get var="url" /></denormalize>ãĆŠå¿l'åĚČãĄŮãĄ¿ãĄŹãĂĆ
    </template>
</category>
```

Input: URLãĄŕwww.***.comãĄğãĄŹãĂĆ
Output: www.***.comãĆŠå¿l'åĚČãĄŮãĄ¿ãĄŹãĂĆ

<denormalize />ãĄŕ<denormalize><star /></denormalize>ãĄĺåŘŇç¿l'ãĄğãĄŹãĂĆ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>URLãĄŕ *ãĄğãĄŹãĂĆ</pattern>
    <template>
         <denormalize />ãĄńåd'L'æŔŻãĄŮãĄ¿ãĄŹãĂĆ
    </template>
</category>
```

Input: URLãĄŕ___ãĄğãĄŹãĂĆ
Output: ***ãĄńåd'L'æŔŻãĄŮãĄ¿ãĄŹãĂĆ

éŰćéĂčéăĚçŻő: *ãČŢãĆąãĆd'ãČńçőąçŘĘïijŽdenormal*, *normalize*

6.1.12 eval

[1.0]

evalèęAçt'ăãĄŕãĂĄ*learn*ãĂĄ*learnf* èęAçt'ăãĄőäÿĂéČĺãĄĺãĄŮãĄęåĽl'çŤĺãĄŢãĆŇãĄ¿ãĄŹãĂĆ
evalèęAçt'ăãĄŕãĂĄåĘĚåőźãĆŠãČĘãĆ■ãĆźãČĹåŇŰãĄŮãĄ§åĂd'ãĆŠè£ŤãĄŮãĄ¿ãĄŹãĂĆ

evalèęAçt'ăãĄőåĘĚåőźãĄńgetèęAçt'ăç■L'ãĆŠèÍŸèijL'ãĄŮãĄęãĄİãĄőåĂd'ãĄőåŘŰå¿ŮãĄńåd'śæŢŮãĄŮãĄ§åät'åŘĹãĂĄ*default-get* ãĄőåĂd'ãĄŇèÍ■åőŽãĄŢãĆŇãĄ¿ãĄŹãĂĆ

æňąãĄőä¿ŃãĄğãĄŕãĂĄevalæŇĞåőŽãĄńãĆĹãĆŁãĂĄnameåđŇåd'L'æŢřâĂŹnameâĂŹãĄőåĂd'ïijŽâĂŹãČđãČ■ãČşâĂŹãĄĺãĂĄn
ãĄİãĄőå¿ŃãĄŞãĄőlearnfãČŐãČijãČL'ãĄńåŘĹèĞt'ãĄŹãĆŇãĂĄâĂŹãČđãČ■ãČşãĄŕèłřãĄğãĄŹãĄŃâĂŹãĄĺãĄĐãĄĘåĚěåŁŻãĆŠ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>çğĄãĄőãČŽãČČãČĹãĄŕ * ãĄő * ãĄğãĄŹãĂĆ</pattern>
    <template>
        ãĄĆãĄłãĄ§ãĄőãČŽãČČãČĹãĄŕãĂĄ<star />ãĄő<star index="2" />ãĄğãĄŹãĄ■ãĂĆ
        <think>
            <set name="animal"><star /></set>
            <set name="name"><star index="2" /></set>
        </think>
        <learnf>
            <category>
                <pattern>
                    <eval>
```

(continues on next page)

(continued from previous page)

```
                    <get name="name"/>
                </eval>
                ãĄŕèłřãĄğãĄźãĄŃãĂĆ
            </pattern>
            <template>
                ãĄĆãĄłãĄŞãĄőãČŽãČČãČĹãĄő
                <eval>
                    <get name="animal"/>
                </eval>
                ãĄğãĄźãĂĆ
            </template>
        </category>
    </learnf>
</template>
</category>
```

Input: çğĄãĄőãČŽãČČãČĹãĄŕçŁňãĄőãČđãČ■ãČşãĄğãĄźãĂĆ
Output: ãĄĆãĄłãĄŞãĄőãČŽãČČãČĹãĄŕçŁňãĄőãČđãČ■ãČşãĄğãĄźãĄ■ãĂĆ
Input: ãČđãČ■ãČşãĄŕèłřãĄğãĄźãĄŃãĂĆ
Output: ãĄĆãĄłãĄŞãĄőãČŽãČČãČĹãĄőçŁňãĄğãĄźãĂĆ

éŰćéĂčéăĚçŻő: *learn*, *learnf*

6.1.13 explode

[1.0]

explodeèęĄçť'ăãĄŕãĂĄåŕ¿èśąæŰĞå■ŮåĹŮãĆŠ1æŰĞå■Ůå■Ÿä¡■ãĄńåĹĘåL'šãĄŮãĂĄå■ŁèğŠãĆźãČŽãČijãĆźãĄğåŇžåĹĞãĆŁãĄâĂŹcoffeeâĂŹãĄĺåĚěåŁŻãĄŮãĄ§ăăť'åŘĹãĂĄexplodeãĆŠæIJL'åŁźãĄńãĄŹãĆŃãĄĺãĂĄâĂŹc o f f e eâĂŹãĄńåd'L'æŔŻãĄŮãĄ¿ãĄŹãĂĆ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>EXPLODE *</pattern>
    <template>
        <explode><star /></explode>
    </template>
</category>
```

<explode />ãĄŕãĂĄ<explode><star /></explode>ãĄĺåŘŇç¿l'ãĄğãĄźãĂĆæŻÿãĄ■æŔŻãĄĹãĆŃãĄĺäżëäÿŃãĄőæğŸãĄńãĄłãĆŁãĄ

```
<category>
    <pattern>EXPLODE *</pattern>
    <template>
        <explode />
    </template>
</category>
```

Input: EXPLODE coffee
Output: c o f f e e

éŰćéĂčéăĚçŻő: *implode*

6.1.14 image

[2.1]

imageèèęAçţ'ããĄŕãČłãČČãČĄãČąãČĞãĆčãĆćèęAçţ'ããĄğãĂĄçŢżåČŔãĄőæČĚåăśãĆŠè£ŢãĄŹãĄŞãĄĺãĄÑãĄğãĄ■ãA¿ãĄŹãĂĆ
åĘĚåőźãĄńãĂĄçŢżåČŔURLãĆĎãČŢãĆąãĆd'ãČńåŘ■ãĆŠæÑĞåőŽãĄŮãA¿ãĄŹãĂĆ

åŕ¿èl'śãĆĺãČşãĆÿãČşãĄğãĄŕãĂĄąãČłãČČãČĄãČąãČĞãĆčãĆćèęAçţ'ããĄńåŕ¿ãĄŮãĄęãĂĄXMLå¡ćåijŔãĄőçţŘæđIJãĆŠè£ŢãĄŮãĄ
åő§éŽŻãĄőçŢżéÍćæŔŔçŢżç■L'ãĄŕãĂĄąãĆşãČşãČŢãĆčãĆŕãČñãČijãĆůãČğãČşåőŽç¿l'ãĄőclientãĄő *renderer*
ãĄğæÑĞåőŽãĄŮãĄşåĞęçŘĘãĆŕãČl'ãĆźãĄőåĹűå¿ąãĄńä¿Íå■ŸãĄŮãĄ¿ãĄŹãĂĆ

```
<category>
    <pattern>çŢżåČŔèąĺçd'ž</pattern>
    <template>
        <image>https://url.for.image</image>
    </template>
</category>
```

6.1.15 first

[1.0]

firstèęAçţ'ããĄŕãĂĄèd'ĞæŢřå■ŸèłđãĄÑãĆĽ'ãĄłãĆÑæŰĞå■ŮåĹŮãĄńåŕ¿ãĄŮãĄęãĂĄåĚĹéă■ãĄőå■ŸèłđãĆŠè£ŢãĄŮãĄ¿ãĄŹãĂĆ
(æŰĞå■ŮåĹŮãĄőå■ŸèłđåĹĘåL'šæŹĆãĄńãĄŕãĂĄ *punctuation_chars*
ãĄőæÑĞåőŽãĄńãĆĹãĆÑçL'źåőŽæŰĞå■ŮéŹd'åd'ŰãĄőåĞęçŘĘãĆŠèąÑãĄĎãA¿ãĄŹãĂĆ)
åŔŰå¿ŮãĄńåd'śæŢŮãĄŮãĄ§ăŧ'åŘĹãĄŕãĂĄãĆşãČşãČŢãĆčãĆŕãČñãČijãĆůãČğãČşåőŽç¿l'ãĄő *default-get*
ãĄőåĂd'ãĄÑè£ŢãĆŁãA¿ãĄŹãĂĆ

- ä¡£çŢĺä¿Ń

```
<category>
    <pattern>çğĄãĄőåŘ■åL'■ãĄŕ * ãĄğãĄŹ </pattern>
    <template>
        ãĄĆãĄłãĄ§ãĄőåŘ■åL'■ãĄŕ <first><star /></first> ãĄŢãĆŞãĄğãĄŹãĄ■ãĂĆ
    </template>
</category>
```

Input: çğĄãĄőåŘ■åL'■ãĄŕ åśśçŢř åd'łéČŐ ãĄğãĄŹ
Output: ãĄĆãĄłãĄ§ãĄőåŘ■åL'■ãĄŕåśśçŢřãĄŢãĆŞãĄğãĄŹãĄ■

RDFãČŁãČñãČČãĆÿãČŹãČijãĆźãĄőæd'IJçţ'ćçţŘæđIJãĄńéĄl'çŢĺãĄŮãĄ§ăŧ'åŘĹãĂĄçţŘæđIJãČłãĆźãČĹåĘĚãĄőåĚĹéă■ãČĞãČ
èl'şçţ'řãĄŕãĂĄ*RDFãĆţãČİãČijãČĹ* ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄãăĄŢãĄĎãĂĆ
JSONå¡ćåijŔãĄőãČĞãČijãĆ£ãĄńãĄŕåŕ¿å£IJãĄŮãĄęãĄĎãA¿ãĄŻãĆŞãĂĆ

éŰćéĂčéăĚçŻő: *rest*

6.1.16 extension

[custom]

extensionèęÀçţ'ãäĄřãĂĄåŕ¿èľ'śãĆĺãČşãĆÿãČşãĄőãĆńãĆźãĆ£ãČđãĆd'ãĆžãĆŠå£ĚèęĄãĄĺãĄŹãĆŃèęÀçţ'ãäĄńãĄłãĆŁãĄ¿ãĄŹãĂ
extensionèęÀçţ'ãäĄğãĄřãĂĄPythonãĄőåĞęçŘĘãĆřãČl'ãĆźãĆŠåŚijãĄşåĞžãĄŹæl'§èČ¡ãĆŠæŔŘä¿ŻãĄŮãĂĄ
`programy.extensions.base.Extension`
ãĆd'ãČşãĆ£ãČŢãĆğãČijãĆźãĆŠåő§èčĚãĄŹãĆŃPythonãČćãĆÿãČěãČijãČńãĆřãČl'ãĆźãĄÿãĄőãČŢãČńãČŠãĆźãĆŠæŇĞåőŽãĄŮã

extensionèęÀçţ'ãäĄőåĘĚåőźãĄŇåĞęçŘĘãĆřãČl'ãĆźãĄńåŕ¿ãĄŹãĆŃåijŢæŢřïijĹæŰĞå■ŮåĹŮïijL'ãĄĺãĄŮãĄęãĂĄåijŢãĄ■æÿąãĄ

èľşçţ'řãĄřãĂĄ *Extensions* ãĆŠåŔĆçĚğãĄŮãĄęãĄŘãĄăãĄŢãĄĎãĂĆ

- åśđæĂğ

| ãČŠãČľãĆąãĆźãĆźãĆŠãĆŠãĆŠ

(continued from previous page)

```
    </template>
</category>
```

Input: çğĄãĄőåŘ■åL’■ãĄŕ george washington
Output: George Washington ãĄŢãĆŞãĂąãĄŞãĆŞãĄńãĄąãĄŕ

6.1.18 gender

[1.0]

genderèęAçt’ăãĄŕãĂąçŹžèl’śæŰĞãĄńåŘńãĄ¿ãĆŇãĆŃæĂğåĹěãĆŠèąĺãĄŹäžžçğřäżčåŘ■èl’đç■L’ãĆŠår¿èśąãĄńãĂąéĂĘąőæĂğ
åd’L’æŔŻåĘĚåőźãĄŕãĂĄ*genderãČŢãĆąãĆd’ãČń* ãĄğæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ

åd’L’æŔŻæŰźæşŢãĄőæŇĞåőŽãĄńãĄŕåd’L’æŔŻåL’■ãĄĺåd’L’æŔŻå¿ŇãĄőãĆżãČČãČĹãĄğèĺŸèijL’ãĄŮãĂĄgenderãĄőãĆżãČČãČ

åd’L’æŔŻår¿èśąãĄőåĹd’åőŽãĄŕãĂĄèŃśæŢřèĺŸåŔůïijŽå■ŁèğŠãĂąãĆńãĆ£ãĆńãČŁïijŽåĚĺèğŠãĄńåd’L’æŔŻãĄŮãĄ§äÿŁãĄğèąŇã

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>* ãĄńäijŽãĄĎãĄ¿ãĄŮãĄ§ãĄŃïij§</pattern>
    <template>
        ãĄĎãĄĹãĂĄ <gender><star/></gender> ãĄńäijŽãĄĎãĄ¿ãĄŮãĄ§ãĂĆ
    </template>
</category>
```

Input: å¡ijãĄńäijŽãĄĎãĄ¿ãĄŮãĄ§ãĄŃïij§
Output: ãĄĎãĄĹãĂĄå¡ijåěşãĄńäijŽãĄĎãĄ¿ãĄŮãĄ§ãĂĆ

éŰćéĂčéăĚçŻő: *ãČŢãĆąãĆd’ãČńçőąçŘĘïijŽgender*

6.1.19 get

[1.0]

getèęAçt’ăãĄŕãĂĄåd’L’æŢřãĄőåĂd’åŔŰå¿ŮãĄńçŤĺãĄĎãĄ¿ãĄŹãĂĆåŔŰå¿ŮãĄńåd’śæŢŮãĄŮãĄ§åăt’åŘĹãĂĄãĆşãČşãČŢãĆčãĆ
default-get ãĄőåĂd’ãĄŇè£ŤãĆŁãĄ¿ãĄŹãĂĆ
ïijĹ*propertiesãČŢãĆąãĆd’ãČń* ãĄğãĄő âĂIJdefault-getâĂİ åőŽç¿l’ãĄŇåĎłåĚĹãĄŢãĆŇãĄ¿ãĄŹãĂĆïijL’
getãĄğåŔŰå¿ŮãĄğãĄ■ãĆŃåĂd’ãĄŕãĂĄ*set*
ãĆŠä¡£ãĄčãĄęãĂĄåŕ¿èl’śåĞęçŘĘåő§æŰ¡æŹĆãĄńåĂd’ãĄőèĺ■åőŽãĆŠèąŇãĄĎãĄ¿ãĄŹãĂĆ
ètůåŃŢæŹĆãĄńåĹìæIJ§åĂd’ãĆŠèĺ■åőŽãĄŹãĆŃåăt’åŘĹãĂĄ*defaultsãČŢãĆąãĆd’ãČń*
ãĄńèĺŸèijL’ãĄŹãĆŃãĄŞãĄĺãĄğãĂĄãĆřãČ■ãČijãČŘãČńåd’L’æŢř(name)ãĄĺãĄŮãĄęåĹl’çŤĺãĄŹãĆŃãĄŞãĄĺãĄŇãĄğãĄ■ãĄ¿ãĄŹ

åd’L’æŢřçĺőåĹěãĄńãĄŕ3çĺőéąđãĄĆãĆŁãĂĄãČ■ãČijãĆńãČńåd’L’æŢřãĄĺä£ìæŇĄæIJ§éŰŞãĄŇçŢřãĄłãĆŃãĆřãČ■ãČijãČŘãČńåd’L

- ãČ■ãČijãĆńãČńåďĽæŢř(var)

âĂĲvarâĂİåśđæĂğãĆŠæŇĞåőŽãĄŹãĆÑãĄŞãĄÍãĄğãĂĄãČ■ãČijãĆńãČńåďĽæŢřæĽśãĄĎãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

ãČ■ãČijãĆńãČńåďĽæŢřãĄŕãĂĄset/getãĄŇèÍŸèijĽãĄŢãĆÑãĄęãĄĎãĆŃcategoryãĄőçŕĎåŽšãĄőãĄ£ä£İæŇãĄŢãĆÑãĄ¿ãĄŹãĂ

- çűŹçűŽä£İæŇãĄĆřãČ■ãČijãČŘãČńåďĽæŢř(name)

âĂĲnameâĂİåśđæĂğãĆŠæŇĞåőŽãĄŹãĆÑãĄŞãĄÍãĄğãĂĄãĆřãČ■ãČijãČŘãČńåďĽæŢřæĽśãĄĎãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆãĆřãČ

ãĄ¿ãĄ§ãĂĄãĆřãČ■ãČijãČŘãČńåďĽæŢřãĄőåĘĚåőźãĄŕçűŹçűŽçŽĎãĄńä£İæŇãĄŢãĄęãĄŁãĆŁãĂĄåŕ¿èľśåĞęçŘĘãĆŠçźřãĆŁ

- æŇĞåőŽçŕĎåŽšä£İæŇãĄĆřãČ■ãČijãČŘãČńåďĽæŢř(data)

âĂĲdataâĂİåśđæĂğãĆŠæŇĞåőŽãĄŹãĆÑãĄŞãĄÍãĄğãĂĄãĆřãČ■ãČijãČŘãČńåďĽæŢřæĽśãĄĎãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆnameãĄ

- åśđæĂğ

ãĆŠãČľãČąãČ¦ãČ¿	åđŃ	å£Ěé Ĺĺ	èłňæŸŐ
name	åďĽæŢřåŘ■	No	ãĆřãČ■ãČijãČŘãČńåďĽæŢř(name)åŘ■ãĆŠæŇĞåőŽ
var	åďĽæŢřåŘ■	No	ãČ■ãČijãĆńãČńåďĽæŢř(var)åŘ■ãĆŠæŇĞåőŽ
data	åďĽæŢřåŘ■	No	ãĆřãČ■ãČijãČŘãČńåďĽæŢř(data)åŘ■ãĆŠæŇĞåőŽ

AIMLãĄőåďĽæŢřãĆŠåĂďãĄÍãĄŮãĄęæŇĞåőŽãĄŹãĆÑåăť åŘĹãĄńåśđæĂğãĄğãĄŕæŇĞåőŽãĄğãĄ■ãĄłãĄĎãĄ§ãĆĄãĂĄå■Řè
ãĄ¿ãĄ§ãĂĄå■ŘèęĄçť ä `tuple` ãĆŠæŇĞåőŽãĄŹãĆÑãĄŞãĄÍãĄğãĂĄRD-
FãČŁãČňãČČãĆÿãČŹãČijãĆźãĄőãĆÍãČňãČąãČşãČĽãĆĆåŔŰå¿ŮãĄğãĄ■ãĄ¿ãĄŹãĂĆèľşçť řãĄŕãĂĄ*RDFãĆţãČĬãČijãČĽ*
ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄäãĄŢãĄĎãĂĆ

- å■ŘèęĄçť ä

ãĆŠãČľãČąãČ¦ãČ¿	åđŃ	å£Ěé Ĺĺ	èłňæŸŐ
name	åďĽæŢřåŘ■	No	ãĆřãČ■ãČijãČŘãČńåďĽæŢř(name)åŘ■ãĆŠæŇĞåőŽ
var	åďĽæŢřåŘ■	No	ãČ■ãČijãĆńãČńåďĽæŢř(var)åŘ■ãĆŠæŇĞåőŽ
data	åďĽæŢřåŘ■	No	ãĆřãČ■ãČijãČŘãČńåďĽæŢř(data)åŘ■ãĆŠæŇĞåőŽ
tuple	å■ŘèęĄçť ä	No	RDFãČŁãČňãČČãĆÿãČŹãČijãĆźãĄőãĆÍãČňãČąãČşãČĽãĆŠåĞęçŘĘãĄŹãĆÑåăť åŘĹãĄńæŇĞå

getèęĄçť ããĄÍãĄŮãĄęãĂĄåśđæĂğãČżå■ŘèęĄçť ããĄğãĂĄ`var`, `name`, `data`, `tuple`
ãĄőãĄĎãĄŽãĆÑãĄŃãĄŇèĺ■åőŽãĄŢãĆÑãĄęãĄĎãĆŃå£ĚèęĄãĄŇãĄĆãĆŁãĄ¿ãĄŹãĂĆ

èďĞæŢřãĄőåśđæĂğãĂĄå■ŘèęĄçť ããĆŠæŇĞåőŽãĄŮãĄ§åăť åŘĹãĄńãĄŕãĂĄäÿ■æ■čæŇĞåőŽãĄÍãĄŮãĄęãĆůãČŁãČłãĆłãĄŕçĎ

åřŽãĂĄåďĽæŢřåŘ■ãĄŕãĂĄåďğæŰĞå■ŮãČżåřŔæŰĞå■ŮãĂĄåĚÍèğŠãČżå■ŁèğŠãĆŠåŇžåĹěãĄŮãĄęçőąçŘĘãĄŮãĄ¿ãĄŹãĂĆ

- ä¡£çŤÍä¿Ń

```
<!-- Access Global Variable -->
<category>
    <pattern>äżŁæŮĕãĄŕ * ãĄğãĄŹ</pattern>
    <template>
        <think><set name="weather"><star/></set></think>
         äżŁæŮĕãĄőåd'l'æřŮãĄŕãĂĄ<get name="weather" />ãĄğãĄŹãĂĆ
    </template>
</category>

<!-- Access Local Variable -->
<category>
    <pattern>æŸŐœŮĕãĄŕ * ãĄğãĄŹ</pattern>
    <template>
        <think><set var="weather"><star/></set></think>
         äżŁæŮĕãĄőåd'l'æřŮãĄŕ<get name="weather" />,æŸŐœŮĕãĄőåd'l'æřŮãĄŕ<get var=
↪"weather"/>ãĄğãĄŹãĂĆ
    </template>
</category>
<category>
    <pattern>åd'l'æřŮãĄŕïij§</pattern>
    <template>
         äżŁæŮĕãĄőåd'l'æřŮãĄŕ<get name="weather" />,æŸŐœŮĕãĄőåd'l'æřŮãĄŕ<get var=
↪"weather"/>ãĄğãĄŹãĂĆ
    </template>
</category>
```

Input: äżŁæŮĕãĄŕæŹťãĆŇãĄğãĄŹãĂĆ
Output: äżŁæŮĕãĄőåd'l'æřŮãĄŕæŹťãĆŇãĄğãĄŹãĂĆ
Input: æŸŐœŮĕãĄŕéŻĺãĄğãĄŹãĂĆ
Output: äżŁæŮĕãĄőåd'l'æřŮãĄŕæŹťãĆŇ,æŸŐœŮĕãĄőåd'l'æřŮãĄŕéŻĺãĄğãĄŹãĂĆ
Input: åd'l'æřŮãĄŕïij§
Output: äżŁæŮĕãĄőåd'l'æřŮãĄŕæŹťãĆŇ,æŸŐœŮĕãĄőåd'l'æřŮãĄŕunknownãĄğãĄŹãĂĆ

ãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşãĄő *dynamic* ãĄğ `variables` ãĄŇåőŽç¿l'ãĄŢãĆŇãĄęãĄĎãĆŃåät'åŘĹãĂąãĆřãČ■ãČijã
`dynamic` ãĄőåőŽç¿l'ãĄŇåĎłåĚĹãĄŢãĆŇãĄ¿ãĄŹãĂĆ

éŰćéĂčéäĚçŻő: *set*, *ãČŢãĆąãĆd'ãČńçőąçŘĘïijŽproperties*

6.1.20 id

[1.0]

idèęAçt'ãäĄŕãĂĄãĆřãČl'ãĆd'ãĆćãČşãČĹåŘ■ãĆŠè£ŤãĄŮãĄ¿ãĄŹãĂĆãĆřãČl'ãĆd'ãĆćãČşãČĹåŘ■ãĄŕãĆřãČl'ãĆd'ãĆćãČşãČĹéŰ
ãĆşãČşãČŢãĆčãĆřãČŢãĆąãĆd'ãČń ãĄőclientåőŽç¿l'ãĄğæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
idèęAçt'ãäĄńãĄŕãĂĄåśđæĂğãČżå■ŘèęAçt'ãäĄŕæŇĞåőŽãĄğãĄ■ãĄ¿ãĄŻãĆŞãĂĆ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>ãĄĆãĄłãĄ§ãĄőåŘ■åL'■ãĄŕïij§</pattern>
    <template>
        <id />
    </template>
</category>
```

Input: ãĄĆãĄłãĄ§ãĄőåŘ■åL’■ãĄŕïij§
Output: console

6.1.21 implode

[custom]

implodeèèęĄçť˘ăăĄŕãĂĄåŕ¿èśąæŰĞå■ŮåĹŮåĘĚãĄńãĄĆãĆŃå■Łèğ˘ŠãĆźãČŽãČijãĆźãĆŠåL’ŁéŹd’ãĄŮãĂĄ1å■Ÿèłđ˘ãĄńçţŘåŘĹãĄ
âĂŸc o f f e
eâĂŹãĄĺåĚěåŁŻãĄŮãĄ§åät’åŘĹãĂĄimplodeãĆŠåő§æŰ¡ãĄŹãĆŃãĄĺãĂĄâĂŹcoffeeâĂŹãĄńåd’L’æŔŻãĄŮãĄ¿ãĄŹãĂĆ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>Implode *</pattern>
    <template>
        <implode><star /></implode>
    </template>
</category>
```

<implode />ãĄŕãĂĄ<implode><star /></implode>ãĄĺåŘŇç¿l’ãĄğãĄŹãĂĆæŻÿãĄ■æŔŻãĄĹãĆŃãĄĺäżěäÿŃãĄőæğŸãĄńãĄłãĆŁã

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>Implode *</pattern>
    <template>
        <implode />
    </template>
</category>
```

Input: Implode c o f f e e
Output: coffee

éŰćéĂčéăĚçŻő: *explode*

6.1.22 input

[1.0]

inputèęĄçť˘ăăĄŕãĂĄåĚěåŁŻãĄŢãĆŃãĄ§çŹžèl’śæŰĞãĄńåŕ¿ãĄŮãĄęãĆđãĆČãĆĄåĞęçŘĘçŤĺãĄńçůĺéŻĘãĄŮãĄ§æŰĞå■ŮåĹŮïijl

çůĺéŻĘåĞęçŘĘãĄğãĄŕãĂĄèŃśæŢřèĺŸåŔůãĄőå■Łèğ˘ŠåŇŰãĄĺãĆńãĆ£ãĆńãČŁãĄőåĚĺèğ˘ŠåŇŰãĂĄãĆđãĆČãĆĄåĞęçŘĘåŕ¿èśąåd’
inputèęĄçť˘ăăĄŕãĂĄpatternåĘĚãĄőãČŕãĆd’ãČńãČL’ãĆńãČijãČL’ <star/>
ãĄĺãĄŕçŢřãĄłãĆŁãĂĄçŹžèl’śæŰĞåĚĺä¡ŞãĄőçŕĐåŻšãĆŠè£ŤãĄŮãĄ¿ãĄŹãĂĆ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>èşłåŢŕãĄŕãĄłãĆŞãĄğãĄźãĄŃïij§</pattern>
    <template>
        ãĄĆãĄłãĄ§ãĄőèşłåŢŕãĄŕãĂĄ"<input />"ãĄğãĄźãĂĆ
    </template>
</category>
```

Input: èşłåŢŕãĄŕãĄłãĆŞãĄğãĄźãĄŃïij§
Output: ãĄĆãĄłãĄ§ãĄőèşłåŢŕãĄŕãĂĄâĂİèşłåŢŕãĄŕãĄłãĆŞãĄğãĄźãĄŃïij§âĂİãĄğãĄźãĂĆ

6.1.23 interval

[1.0]

intervalèęAçt'ããĄŕãĂĄ2ãĄd'ãĄőæŮěæŹĆãĄőåůőåĹĘãĆŠèÍĹçőŮãĄŮãĄ¿ãĄźãĂĆïijĹãČđãĆd'ãČŁãĆźãĄőåůőåĹĘãĄńãĆĆår¿å£

æŮěæŹĆãĄőå¡ćåijŔæŇĞåőŽãĄńãĄŕãĂĄPythonãĄőæŮěæŹĆæŰĞå■ŮåĹŮãĄőæŻÿåijŔãĆŠåĹl'çŤĺãĄŮãĄ¿ãĄźãĂĆ
èl'şçt'řãĄŕ PythonãĄőãČđãČŃãČěãĆćãČń ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăãĄŢãĄĎãĂĆ

- åśđæĂğ

ãČŚãČľäČãąĆãĆąjaCãĆĘĚéälňæŸŐ			
format	string	No	æŮěæŹĆãČĞãČijãĆ£ãĄőæŻÿåijŔãĂĆçIJĄçŢěåĂd'ãĄŕ âĂŸ%câĂŹ

- å■ŘèęAçt'ă

ãČŚãČľäČãąĆãĆąjaCãĆĘĚéälňæŸŐ			
format	string	No	æŮěæŹĆãČĞãČijãĆ£ãĄőæŻÿåijŔãĂĆçIJĄçŢěåĂd'ãĄŕ âĂŸ%câĂŹ
from	string	Yes	èÍĹçőŮãĆŚèąÑãĄĘåğŃçńŕæŮěæŹĆãĆŚformatãĄőæŻÿåijŔãĄğæŇĞåőŽ
to	string	Yes	èÍĹçőŮãĆŚèąÑãĄĘçţĆçńŕéŰŃåğŃæŮěæŹĆãĆŚformatãĄőæŻÿåijŔãĄğæŇĞåőŽ
style	string	No	åĞžåŁŽãĄźãĆŃå■Ÿä¡■ãĆŚæŇĞåőŽãĂĆçIJĄçŢěåĂd'ãĄŕ âĂŸdaysâĂŹ

`style` ãĄğæŇĞåőŽãĄźãĆŃå¡ćåijŔãĄńãĄŕãĂĄäżëäÿŃãĄőçĺőęđãĄŇãĄĆãĆŁãĄ¿ãĄźãĂĆ

- æŮěæŹĆãĄőå■Ÿä¡■æŇĞåőŽïijŽ âĂŸyearsâĂŹ, âĂŸmonthsâĂŹ, âĂŸweeksâĂŹ, âĂŸdaysâĂŹ, âĂŸhoursâĂŹ, âĂŸminutesâĂŹ, âĂŸsecondsâĂŹ, âĂŸmicrosecondsâĂŹ
- èd'ĞåŘĹå■Ÿä¡■æŇĞåőŽïijŽ âĂŸymdâĂŹ, âĂŸhmsâĂŹ, âĂŸymdhmsâĂŹ

`from`, `to` ãĄğæŇĞåőŽãĄŢãĆŇãĄ§ãČĞãČijãĆ£ãĄŇ `format`
ãĄőæŻÿåijŔãĄĺçŢřãĄłãĆŃåät'åŘĹãĆĎãĂĄäÿ■æ■čãĄłå¡ćåijŔãĄőåät'åŘĹãĂĄåő§èąŇæŹĆãĄńä¿Ńåd'ŰãĄŇçŹžçŤ§ãĄŮãĄ¿ãĄźãĂĆ
åŘĹãĂĄ`style`
ãĄŇåd'L'æŢřç■L'ãĄğæŇĞåőŽãĄŢãĆŇãĂĄåő§èąŇæŹĆãĄńår¿èśąåd'ŰãĄőåÐd'ãĄŇä¡£çŤĺãĄŢãĆŇãĄ§åät'åŘĹãĂĄçţŘæđIJãĄĺã

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>ãĄĆãĄłãĄ§ãĄŕä¡Ţæ■şãĄğãĄźãĄŃïij§</pattern>
    <template>
        <interval format="%B %d, %Y">
```

(continues on next page)

(continued from previous page)

```
            <style>years</style>
            <from><bot name="birthdate"/></from>
            <to><date format="%B %d, %Y" /></to>
        </interval>
        æ■şãĄğãĄźãĂĆ
    </template>
</category>
```

Input: ãĄĆãĄłãĄ§ãĄŕä¡Ţæ■şãĄğãĄźãĄŃïij§
Output: 5æ■şãĄğãĄźãĂĆ

éŰćéĂčéăĚçŻő: *date*

6.1.24 json

[custom]

jsonèęĄçť ăăĄŕãĂĄJSONãĆŠãĆůãČŁãČłãĆłãĄğåĽ'çŤĺãĄŹãĆŃãĄ§ãĆĄãĄőæľ§èČ¡ãĄğãĂĄãČĞãČijãĆ£ãĄőåŔŰå¿ůãĄĺèĺ■åőŽ
*SubAgent*ãĂĄ*metadata*ãĂĄ*NLU*
(éńŸåžęæĎŔåŻşèğčéĞĹ)ãĄłãĄĮ'ãĄğä¡£çŤĺãĄŹãĆŃJSONãČĞãČijãĆ£ãĆŠåĽ'çŤĺãĄŹãĆŃãĄ§ãĆĄãĄńä¡£çŤĺãĄůãĄ¿ãĄŹãĂĆ
èľşçť řãĄŕãĂĄ *JSON* ãĆŠåŔĆçĚğãĄůãĄęãĄŔãĄăãĄŢãĄĎãĂĆ

åśđæĂğïijŔå■ŘèęĄçť ăãĄőname/var/dataãĄğæŇĞåőŽãĄŹãĆŃåď'L'æŢřåŘ■ãĄńãĄŕãĂĄget/setãĄğåőŽç¿l'ãĄůãĄ§åď'L'æŢřåŘ■ãĆ

ä¡ĘãĄůãĂĄèĺ■åőŽãĆŠèąÑãĄĘåăť'åŘĹãĄńãĄŕãĂĄåď'L'æŢřåŘ■ãĄĺãĄĺãĆĆãĄńãĂĄJSONãĄĺãĄůãĄęãĄőãĆ■ãČijãĆŠäžŸåŁăăĄ
ãĂĂæŇĞåőŽä¿ŃïijŽ
âĂIJåď'L'æŢřåŘ■.ãĆ■ãČijâĂİãĂĂïijĹåśđæĂğãĆżå■ŘèęĄçť ăăĄğâĂİkeyâĂİãĆŠæŇĞåőŽãĄůãĄ§åăť'åŘĹãĄńãĄŕãĂĄåď'L'æŢřåŘ
åď'L'æŢřåđŃ varãĄŕãČ■ãČijãĆńãČńåď'L'æŢřãĂĄnameãĄŕãĆřãČ■ãČijãČŘãČńåď'L'æŢřãĂĄ-
dataãĄŕãĆřãČ■ãČijãČŘãČńåď'L'æŢřãĄğãĄźãĂĆ

ãĄ¿ãĄ§ãĂĄãČąãĆ£ãČĞãČijãĆ£åď'L'æŢřãĆĎãĂĄãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹãĄőæĹżãĆŁåĂď'ç■L'ãĄőãĆůãĆźãČĘãČăåŻžåć

- åśđæĂğ

ãČŠãČľãČąãĆąãĆ£ãČĞãČijãĆ£åď'L'æŢřåŘ■				ãĆřãČ■ãČijãČŘãČńåď'L'æŢř(name)åŘ■ãĆŠæŇĞåőŽãĄůãĄ¿ãĄŹãĂĆãĆ■ãČijåŘ■ãĆŠäž
name	JSONåď'L'æŢřåŘ■		No	
var	JSONåď'L'æŢřåŘ■		No	ãČ■ãČijãĆńãČńåď'L'æŢř(var)åŘ■ãĆŠæŇĞåőŽãĄůãĄ¿ãĄŹãĂĆãĆ■ãČijåŘ■ãĆŠäžŸåŁăă
data	JSONåď'L'æŢřåŘ■		No	ãĆřãČ■ãČijãČŘãČńåď'L'æŢř(data)åŘ■ãĆŠæŇĞåőŽãĄůãĄ¿ãĄŹãĂĆãĆ■ãČijåŘ■ãĆŠäžŸ
function		len	No	åŕ¿èśąãĄőJSONãČůãČ■ãĆŠãČĘãĆčãĄŇéĚ■åĹůãĄőåăť'åŘĹãĂĄéĚ■åĹůéŢůãĆŠåŘŰå¿
		delete	No	åŕ¿èśąãČůãČ■ãĆŠãČĘãĆčãĆŠåL'ŁéŹď'ãĄůãĄ¿ãĄŹãĂĆéĚ■åĹůãĄőåăť'åŘĹãĄğindexãĆ
		insert	No	JSONéĚ■åĹůãĄńåŕ¿ãĄŹãĆŃåĂď'ãĄőè£¡åŁăăĆŠæŇĞåőŽãĄůãĄ¿ãĄŹãĂĆéĚ■åĹůÇŢłå
index	ãĆď'ãČşãČĞãČČãĆřãĆ%		No	JSONãČĞãČijãĆ£ãĆŠåŔŰå¿ůãĄŹãĆŃåăť'åŘĹãĄőãĆď'ãČşãČĞãČČãĆřãĆźãĆŠæŇĞåőŽ
item		key	No	JSONãČĞãČijãĆ£ãĄŇãĆĽ'ãĆ■ãČijãĆŠåŔŰå¿ůãĄŹãĆŃåăť'åŘĹãĄńä¡£çŤĺãĄůãĄ¿ãĄŹã
key	ãĆ■ãČijæŇĞåőŽ		No	JSONãČĞãČijãĆ£ãĆŠæŞ■ä¡IJãĄŹãĆŃãĆ■ãČijãĆŠæŇĞåőŽãĄůãĄ¿ãĄŹãĂĆ
type		string	No	æŢřåĂď'ãĆżèńŰçŘĘåĂď'ãĆżnullåĂď'ãĆŠæŰĞå■ŮåĹůãĄĺãĄůãĄęåĞęçŘĘãĄŹãĆŃãĄŞ

jsonèęĄçť ăăĄĺãĄůãĄęãĂĄ`var`, `name`, `data` ãĄőãĄĐãĄŽãĆŃãĄŃãĄŇèĺ■åőŽãĄŢãĆŃãĄęãĄĐãĆŃå£ĚèęĄãĄŇãĄĆãĆŁãĄ¿ãĄ

- å■ŘèęĄçť'ă

ãĆůãČŁãČłãĆłãĄőåď'Ľ'æŢřãĆŠåĂď'ãĄĺãĄŮãĄęæŇĞåőŽãĄŹãĆŃåäť'åŘĽãĄńåśđæĂğãĄğãĄŕæŇĞåőŽãĄğãĄ■ãĄłãĄĎãĄ§ãĆĄã

åŃŢä¡ĲãĄŕåśđæĂğãĄĺåŘŇãĄŸåŃŢä¡ĲãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆåŘŇãĄŸåśđæĂğåŘ■ãĂĄå■ŘèęĄçť'ääŘ■ãĆŠæŇĞåőŽãĄŮãĄ§ãã

ãČŠãČľãČąãČąãČąãČąãČĘåĂĘéáłæŸŐ			
function	éŰćæŢřåŘ■	No	JSONãĄńåř¿ãĄŹãĆŃåĞęçŘĘãĆłãČŮãĆůãČğãČşãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆåĚĚåőźãĄńãĄď'ãĄ
index	ãĆď'ãČşãČĞ	No	JSONãČĞãČijãĆ£ãĆŠåŘŰå¿ŮãĄŹãĆŃåäť'åŘĽãĂĄJSONãĆłãČŰãĆÿãČğãĆŕãČĹãĂĄéĚ■åĹŮãĄńå
item	ãĆ■ãČijåŘ■	No	JSONãČĞãČijãĆ£ãĄŃãĆĽ'ãĆ■ãČijãĆŠåŘŰå¿ŮãĄŹãĆŃåäť'åŘĽãĄńä¡£çŤĺãĄŮãĄ¿ãĄŹãĂĆãĄŞãĄ
key	ãĆ■ãČijæŇĞåőŽ	No	JSONãČĞãČijãĆ£ãĆŠæŞ■ä¡ĲãĄŹãĆŃãĆ■ãČijãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ

- ä¡£çŤĺä¿Ń

âĂĲtransitâĂİãĄĺãĄĎãĄĘSubAgentãĄŃãĆĽ'ãĄőãČňãĆźãČİãČşãĆźãĄŇè£ŤãĄčãĄęãĄ■ãĄ§åäť'åŘĽãĄőJSONãĄőãČĞãČijãĆ£ã

äżĕäÿŃãĄőjsonãČĞãČijãĆ£ãĄŃSubAgentãĄŃãĆĽ'è£Ťå■ť'ãĄŢãĆŃãĄ§åäť'åŘĽãĂĄâĂİ__SUBAGENT__.transitâĂİãĄŃSubAger

JSONãČĞãČijãĆ£ãĆŠåŘŰå¿ŮãĄŹãĆŃåäť'åŘĽãĂĄåśđæĂğãĄńåř¿èśąãĄĺãĄłãĆŃjsonåŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĄŃãĂĄãĄŞ

JSONãČĞãČijãĆ£ãĄőå■ŘèęĄçť'ääĄőåŘŰå¿ŮãĆŠèąŇãĄĘåäť'åŘĽãĂĄjsonåŘ■ãĄńãĂĄèęĄçť'äæŕŐãĄőãĆ■ãČijåŘ■ãĆŠâĂİ.âĂİã
ãĄğæŇĞåőŽãĄŹãĆŃæŰźæşŢãĄŃãĄĆãĆŁãĄ¿ãĄŹãĂĆ

```
{
    "transportation":{
        "station":{
            "departure":"æİśäžň",
            "arrival":"äžňéČ¡"
        },
        "time":{
            "departure":"2018/11/1 11:00",
            "arrival":"2018/11/1 13:30"
        }
    }
}
```

äÿŁèĺŸä¿ŃãĄőæğŸãĄńãĂĄtransportation.station.departureãĆŠè£Ťå■ť'ãĄŹãĆŃåäť'åŘĽãĂĄ

```
<category>
    <pattern>æİśäžňãĄŃãĆĽ'äžňéČ¡ãĄńèąŇãĄ■ãĄ§ãĄĎãĂĆ</pattern>
    <template>
        <json var="__SUBAGENT__.transit.transportation.station.departure"/>
↪åĞžçŹžãĄğãĄŹãĄ■ãĂĆ
    </template>
</category>
```

Input: æİśäžňãĄŃãĆĽ'äžňéČ¡ãĄńèąŇãĄ■ãĄ§ãĄĎãĂĆ
Output: æİśäžňåĞžçŹžãĄğãĄŹãĄ■ãĂĆ

éŰćéĂčéĂĚçŽő: *JSON*, *SubAgent*

6.1.25 learn

[2.0]

learnèęAçť ăăAŕãĂAåŕ¿èľ śăAőæİąäżűãAńăĆĹãĆŁăČęăCijăĆűåŻžæIJL'ãAőæŰřãA§ăAŁcategoryãĆŠçŹżéŇšăAŲãA¿ãAŹãĂĆãAŹ

æŰřãA§ăAŁcategoryãAŕãČąãČćãČłäÿŁãAńä£İæŇAãAŢãĆŇãAęãAŁãĆŁãĂAcontextãAŇæIJL'åŁźãAŁæIJ§éŰŞăĂAåŘŇäÿĂăĆŕãČ
çŹżéŇšãAŢãĆŇãA§categoryãAŕãĂAäżŰãAőãĆůãČŁãČłãĆłãAg *restlearn* èęAçť ăăČż *resetlearnf*
èęAçť ăăAŇåő§èąŇãAŢãĆŇãĆŇãA¿ãAgä£İæŇAãAŢãĆŇãA¿ãAŹãĂĆ
åĹİæIJ§ãČ■ãCijãČL'ãAŢãĆŇãĆŃcategoryïijĹ*categoriesãĆĺãČşãČĘãĆčãČĘãĆč*
ãAgåśŢéŰŃ)ãAĺåŘŇãAŸPatternèęAçť ăăĆŠæŰřãA§ăAńçŹżéŇšãAŲãA§åăť åŘĹãĂAlearnèęAçť ăăAgæŇĞåŐŽãAŲãA§categoryã

çŹżéŇšåŔŕèČ¡ãAŁcategoryæŢřãAŕãĂAąãĆşãČşãČŢãĆčãĆŕãČňãCijãĆůãČgãČşåőŽç¿l'ãAő *åĹűéŹŘåĂd'åőŽç¿l'*
ãAő `max_categories`
ãAgåĹűéŹŘãAŢãĆŇãAęãAŁãĆŁãĂAlearnèęAçť ăăAgăAőçŹżéŇšãĆĆåĹűéŹŘãAŢãĆŇãA¿ãAŹãĂĆ

åĹűéŹŘæŢřãAńéĄŤãAŮãA§çŁűæĚŃãAgæŰřèęŔçŹżéŇšãĆŠèąŇãAčãA§ăăť åŘĹãAńãAŕãĂAåĞęçŘEä¿Ńåd'ŰãAŇçŽžçŢ§ãAŮãA

learnfãAŕãČŢãĆąãĆd'ãČńä£İæŇAąãAŁãAőãAgãĂAbotåE■ètůåŃŢãAgãĆĆçŁűæĚŃãĆŠä£İæŇAąãAŮãA¿ãAŹãAŇãĂAlearnãAŕbotå

å■ŘèęAçť ăăAńãAŕãĂAcategoryèęAçť ăăĆŠèÍŸè£řãAŮãĂAçŹżéŇšæŹĆãAőåd'L'æŢřãAőåĂd'ãĆŠåĞęçŘEæİąäżűãAńåŘńãĆąãĆŇ
eval ãĆŠåĹl'çŤÍãAŮãA¿ãAŹãĂĆ

äÿĂåžęãAńèd'ĞæŢřãAőcategoryãĆŠçŹżéŇšãAŹãĆŇãAŞãAÍãĆĆåŔŕèČ¡ãAgãAŹãAŇãĂAtopicèęAçť ăăAgãĆřãČńãCijãČŮåŇŰãA
åřŽãĂAlearnèęAçť ăăAőçţŘædIJãAŕãĂAåÿÿãAńçl'žæŰĞå■ŮãAńãAŁãĆŁãA¿ãAŹãĂĆ

- ä¡£çŤÍä¿Ń

```
<category>
    <pattern>çğĄãĄőãČžãČČãČĹãĄŕ * ãĄő * ãĄğãĄźãĂĆ</pattern>
    <template>
        ãĄĆãĄłãĄ§ãĄőãČžãČČãČĹãĄŕãĂĄ<star />ãĄő<star index="2" />ãĄğãĄźãĄ■ãĂĆ
        <think>
            <set name="animal"><star /></set>
            <set name="name"><star index="2" /></set>
        </think>
        <learn>
            <category>
                <pattern>
                    <eval>
                        <get name="name"/>
                    </eval>
                    ãĄŕèłřãĄğãĄźãĄŃãĂĆ
                </pattern>
                <template>
                    ãĄĆãĄłãĄ§ãĄőãČžãČČãČĹãĄő
                    <eval>
                        <get name="animal"/>
                    </eval>
                    ãĄğãĄźãĂĆ
                </template>
            </category>
```

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```
        </learn>
    </template>
</category>
```

Input: çğĄãĄőãČŽãČČãČĹãĄŕçŁňãĄőãČđãČ■ãČşãĄğãĄŹãĂĆ
Output: ãĄĆãĄłãĄ§ãĄőãČŽãČČãČĹãĄŕçŁňãĄőãČđãČ■ãČşãĄğãĄŹãĄ■ãĂĆ
Input: ãČđãČ■ãČşãĄŕèłřãĄğãĄŹãĄŃãĂĆ
Output: ãĄĆãĄłãĄ§ãĄőãČŽãČČãČĹãĄőçŁňãĄğãĄŹ

éŰćéĂčéăĚçŻő; *eval*, *learnf* , *restlearn*, *resetlearnf*

6.1.26 learnf

[2.0]

learnfèęĄçť'ăãĄŕãĂĄåŕ¿èl'śãĄőæİąäżűãĄńãĆĹãĆŁãČęãČijãĆűåŻžæIJL'ãĄőæŰřãĄ§ãĄłcategoryãĆŠçŹźéŇšãĄŮãĄ¿ãĄŹãĂĆãĄŹ

æŰřãĄ§ãĄłcategoryãĄŕãČąãČćãČłäÿŁãĄĺãĄĺãĆĆãĄńãĂĄãČŢãĆąãĆd'ãČńäÿŁãĄńãĆĆä£ĺæŇĄãĄŢãĆŇãĄęãĄŁãĆŁãĂĄäżŰãĄ
restlearn èęĄçť'ăãČż *resetlearnf* èęĄçť'ăãĄŇåő§èąŇãĄŢãĆŇãĆŃãĄ¿ãĄğä£ĺæŇĄãĄŮçűŽãĄŚãĄ¿ãĄŹãĂĆ

çŹźéŇšãĄŢãĆŇãĄ§categoryãĄŕãĂĄåŘŇäÿĂãĆŕãČl'ãĆd'ãĆćãČşãČĹãĆŠåĹl'çŤĺãĄŹãĆŃåŘŇäÿĂãČęãČijãĆűãĄŃãĆL'ãĄőãĆćãĆ
åĹĺæIJ§ãČ■ãČijãČL'ãĄŢãĆŇãĆŃcategoryïijĹ*categoriesãĆĺãČşãČĘãĆčãČĘãĆč*
ãĄğåśŢéŰŃ)ãĄĺåŘŇãĄŸPatternèęĄçť'ăãĆŠæŰřãĄ§ãĄńçŹźéŇšãĄŮãĄ§åät'åŘĹãĂĄlearnfèęĄçť'ăãĄğæŇĞåőŽãĄŮãĄ§categoryã

çŹźéŇšåŔŕèČ¡ãĄłcategoryæŢřãĄŕãĂĄãĆşãČşãČŢãĆčãĆŕřãČňãČijãĆůãČğãČşåőŽç¿l'ãĄő *åĹűéŹŘåĂd'åőŽç¿l'*
ãĄő `max_categories`
ãĄğåĹűéŹŘãĄŢãĆŇãĄęãĄŁãĆŁãĂĄlearnèęĄçť'ăãĄğãĄőçŹźéŇšãĆĆåĹűéŹŘãĄŢãĆŇãĄ¿ãĄŹãĂĆ

åĹűéŹŘæŢřãĄńéĄŤãĄŮãĄ§çŁűæĚŇãĄğæŰřèęŔçŹźéŇšãĆŠèąŇãĄčãĄ§åät'åŘĹãĄńãĄŕãĂĄåĞęçŘEä¿Ńåd'ŰãĄŇçŹžçŤ§ãĄŮãĄ

learnfãĄŕãČŢãĆąãĆd'ãČńä£ĺæŇĄãĄłãĄőãĄğãĂĄbotãĄőåE■èţůåŃŢæŹĆãĄńåĘ■ãČ■ãČijãČL'ãĄŢãĆŇãĄ¿ãĄŹãĂĆ

å■ŘèęĄçť'ăãĄńãĄŕãĂĄcategoryèęĄçť'ăãĆŠèÍŸè£řãĄŮãĂĄçŹźéŇšæŹĆãĄőåd'L'æŢřãĄőåĂd'ãĆŠåĞęçŘEæİąäżűãĄńåŘńãĆĄãĆŃ
eval ãĆŠåĹl'çŤĺãĄŮãĄ¿ãĄŹãĂĆ

äÿĂåžęãĄńèd'ĞæŢřãĄőcategoryãĆŠçŹźéŇšãĄŹãĆŃãĄŞãĄĺãĆĆåŔŕèČ¡ãĄğãĄŹãĄŃãĂĄtopicèęĄçť'ăãĄğãĆřãČńãČijãČŮåŇŰãĄ
åřŽãĂĄlearnfèęĄçť'ăãĄőçţŘædIJãĄŕãĂĄåÿÿãĄńçl'žæŰĞå■ŮãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>çğĄãĄőãČŽãČČãČĹãĄŕ * ãĄő * ãĄğãĄŹ</pattern>
    <template>
        ãĄĆãĄłãĄ§ãĄőãČŽãČČãČĹãĄŕãĂĄ<star />ãĄő<star index="2" />ãĄğãĄŹãĄ■ãĂĆ
        <think>
            <set name="animal"><star /></set>
```

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```
            <set name="name"><star index="2" /></set>
        </think>
        <learnf>
            <category>
                <pattern>
                    <eval>
                        <get name="name"/>
                    </eval>
                    ãĄŕèłřãĄğãĄŹãĄŃãĂĆ
                </pattern>
                <template>
                        ãĄĆãĄłãĄ§ãĄőãČŽãČČãČĹãĄő
                    <eval>
                        <get name="animal"/>
                    </eval>
                    ãĄğãĄŹãĂĆ
                </template>
            </category>
        </learnf>
    </template>
</category>
```

Input: çğĄãĄőãČŽãČČãČĹãĄŕçŁňãĄőãČđãČ■ãČşãĄğãĄŹãĂĆ
Output: ãĄĆãĄłãĄ§ãĄőãČŽãČČãČĹãĄŕçŁňãĄőãČđãČ■ãČşãĄğãĄŹãĄ■ãĂĆ
Input: ãČđãČ■ãČşãĄŕèłřãĄğãĄŹãĄŃãĂĆ
Output: ãĄĆãĄłãĄ§ãĄőãČŽãČČãČĹãĄőçŁňãĄğãĄŹãĂĆ

éŰćéĂčéăĚçŻő: *eval*, *learn*, *restlearn*, *resetlearnf*

6.1.27 li

[1.0]

lièęĄçť ăãĄŕãĂĄconditionèęĄçť ăãĄğãĄőåĹĘåšŘæİąäżűãĄőæŇĞåőŽãĄĺãĂĄrandomèęĄçť ăãĄğãĄőéĄÿæŁđèęĄçť ăãĆŠæŇĞåő

conditionèęĄçť ăãĄőå■ŘèęĄçť ăãĄĺãĄŮãĄęä¡£çŤĺãĄŹãĆŃãĆřãČ■ãČijãĆńãČńåď'L'æŢř(name)åŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
èľşçť řãĄłåĹľçŤĺæŰźæşŢãĄŕãĂĄ*condition* ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăãĄŢãĄĎãĂĆ

- å■ŘèęĄçť ăïijĹâĂŹloopâĂŹäžěåď'ŰãĄŕåśđæĂğãĄğãĆĆæŇĞåőŽåŔŕèČ¡ãĂĆïijL'

ãČŠãČľãČąąččąąąčąąĘéěäľnæŸŐ			
name	åď'L'æŢřåŘ■o		åĹĘåšŘæİąäżűãĄĺãĄŹãĆŃãĆřãČ■ãČijãČŘãČńåď'L'æŢř(name)åŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
var	åď'L'æŢřåŘ■o		åĹĘåšŘæİąäżűãĄĺãĄŹãĆŃãČ■ãČijãĆńãČńåď'L'æŢř(var)åŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
data	åď'L'æŢřåŘ■o		åĹĘåšŘæİąäżűãĄĺãĄŹãĆŃãĆřãČ■ãČijãČŘãČńåď'L'æŢř(data)åŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
bot	ãČŮãČ■ãČŃãČĘąĆĘąĆĘąŘ■æİąäżűãĄĺãĄŹãĆŃBotåŽžæIJL'æČĚåăśiijĹãČŮãČ■ãČŠãĆĘãĆčïijL'åŘ■ãĆŠæŇĞåőŽãĄŮãĄ
value	åĹd'åőŽåĂŇo		åĹĘåšŘæİąäżűãĄĺãĄłãĆŃåĂd'ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆïijĹåď'ğæŰĞå■ŮãČżåřŔæŰĞå■ŮãĂĄ
regex	åĹd'åőŽåĂŇo		åĹĘåšŘæİąäżűãĄĺãĄłãĆŃåĂd'ãĆŠæ■čèęŔèąĺçŔ¿ãĄğæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆåĹd'åőŽãĄŕåőŃåĚĺ
loop	string	No	conditionèęĄçť ăåĘĚãĄğãĄőãČńãČijãČŮåĞęçŘĘãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ

randomèęĄçť ăãĄőå■ŘèęĄçť ăãĄĺãĄŮãĄęä¡£çŤĺãĄŹãĆŃåăť'åŘĹãĄńãĄŕãĂĄåśđæĂğãĆĎå■ŘèęĄçť ăãĄőèęŔåőŽãĄŕãĄĆãĆŁãĄ
èľşçť řãĄłåĹľçŤĺæŰźæşŢãĄŕãĂĄ*random* ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăãĄŢãĄĎãĂĆ

éŰćéĂčéăĚçŻő: *condition*, *loop*, *random*

6.1.28 link

[2.1]

linkèęĄçť'ăăĄŕăĂĄäijŽèľ'śäÿ■ăĄńăČęăČijăĆűăĄńèąĺçď'žăĄŹăĆŃURLăĄłăĄľ'ăĄőçŤĺéĂŤăĄğåĹ'çŤĺăĄŢăĆŃăĆŃăČłăČČăČĄăČ
å■ŘèęĄçť'ăăĄĺăĄŮăĄęăĂĄèąĺçď'žăĆĎèł■ăĄ£äÿŁăĄŠăĄńä¡£çŤĺăĄŹăĆŃăČĘăĆ■ăĆźăČĹăĂĄéĄůçğżåĚĹăĄőurlăĆŠèĺŸèijĽăĄğ

åŕ¿èľ'śăĆĺăČşăĆÿăČşăĄğăĄŕăĂĄăČłăČČăČĄăČąăČĞăĆčăĆćèęĄçť'ăăĄńåŕ¿ăĄŮăĄęăĂĄXMLå¡ćåijŔăĄőçţŘæđIJăĆŠè£ŤăĄŮăĄ
åő§éŽŻăĄőçŤżéİćæŔŔçŤżç■Ľ ăĄŕăĂĄăĆşăČşăČŢăĆčăĆřăČńăČijăĆůăČğăČşåőŽç¿ľ ăĄőclientăĄő *renderer*
ăĄğæŃĞåőŽăĄŮăĄ§åĞęçŘĘăĆŕăČľ ăĆźăĄőåĹűå¿ąăĄńä¿İå■ŸăĄŮăĄ¿ăĄŹăĂĆ

- å■ŘèęĄçť'ăăĂïijĹåśđæĂğăĄğăĄőæŃĞåőŽăĆĆåŔŕèČ¡ïijĽ

ăČŠăČľăČąăČijăĆ£	ăĆ£ăĆďăČŮ	å£ĚéăĹ	èłňæŸŐ
text	string	Yes	ăČIJăĆ£ăČşăĄÿăĄőèąĺçď'žăČĘăĆ■ăĆźăČĹăĆŠèĺŸèijĽăĄŮăĄ¿ăĄŹăĂĆïijĹçľ'žæŰĞå■ŮăĆŠèĺśåőźă
url	string	No	ăČIJăĆ£ăČşæŁijäÿŃæŹĆăĄőURLăĆŠèĺŸèijĽăĄŮăĄ¿ăĄŹăĂĆ

```
<category>
    <pattern>æď'IJçť'ć</pattern>
    <template>
        <link>
            <text>æď'IJçť'ćăĆţăĆď'ăČĹ</text>
            <url>searchsite.com</url>
        </link>
    </template>
</category>
```

6.1.29 list

[2.1]

listèęĄçť'ăăĄŕăĂĄitemăĄńèĺŸèijĽăĄŮăĄ§èęĄçť'ăăĆŠăČłăĆźăČĹå¡ćåijŔăĄğè£ŤăĄŹăČłăČČăČĄăČąăČĞăĆčăĆćèęĄçť'ăăĄğăĄ
å■ŘèęĄçť'ăăĄőitemăĄńăČłăĆźăČĹăĄőåĘĚåőźăĆŠèĺŸèijĽăĄŹăĆŃăĄŞăĄĺăĄŃăĄğăĄ■ăĄ¿ăĄŹăĂĆăĄ¿ăĄ§ăĂĄitemăĄńlistăĆŠ

åŕ¿èľ'śăĆĺăČşăĆÿăČşăĄğăĄŕăĂĄăČłăČČăČĄăČąăČĞăĆčăĆćèęĄçť'ăăĄńåŕ¿ăĄŮăĄęăĂĄXMLå¡ćåijŔăĄőçţŘæđIJăĆŠè£ŤăĄŮăĄ
åő§éŽŻăĄőçŤżéİćæŔŔçŤżç■Ľ ăĄŕăĂĄăĆşăČşăČŢăĆčăĆřăČńăČijăĆůăČğăČşåőŽç¿ľ ăĄőclientăĄő *renderer*
ăĄğæŃĞåőŽăĄŮăĄ§åĞęçŘĘăĆŕăČľ ăĆźăĄőåĹűå¿ąăĄńä¿İå■ŸăĄŮăĄ¿ăĄŹăĂĆ

- å■ŘèęĄçť'ă

ăČŠăČľăČąăČijăĆ£	ăĆ£ăĆďăČŮ	å£ĚéăĹ	èłňæŸŐ
item	string	Yes	ăČłăĆźăČĹăĄőåĘĚåőźăĆŠèĺŸèijĽăĄŮăĄ¿ăĄŹăĂĆ

`item` ăĄńăĄŕăĂĄăČĘăĆ■ăĆźăČĹäżěåď'ŰăĄńăĂĄ*button* ăĆĎăĂĄ*image* ç■ĽăĄőăČłăČČăČĄăČąăČĞăĆčăĆćèęĄçť'ăăĆŠéĚ■ç¡ő

```
<category>
    <pattern>ăČłăĆźăČĹ</pattern>
    <template>
        <list>
            <item>
                <list>
                    <item>ăČłăĆźăČĹăĆćăĆď'ăČĘăČă 1.1</item>
                    <item>ăČłăĆźăČĹăĆćăĆď'ăČĘăČă 1.2</item>
                </list>
            </item>
            <item>ăČłăĆźăČĹăĆćăĆď'ăČĘăČă 2.1</item>
            <item>ăČłăĆźăČĹăĆćăĆď'ăČĘăČă 3.1</item>
        </list>
    </template>
</category>
```

éŰćéĂčéăĚçŻő: *card*, *button*, *image*

6.1.30 log

[custom]

logèęAçt'ääAŕéŰŃçŽžèĂĚçŤĺãĄőèęAçt'ããĄğãĂĄãĄŞãĄőèęAçt'ããĆŠèĺŸèijĽãĄŹãĆŃãĄĺãĂĄbotãĄőãČ■ãĆŕãČŢãĆąãĆď ãČńãĄ
ãČ■ãĆőãČşãĆŕãČńãČŹãČńãĄŕãĂĄlevelåśđæĂğãĄğæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ

- åśđæĂğ

ãČŠãČŕãČąãČąãĆčãČĚãĆč	åŔĚéăĺ	æŸŐ	
level	åď L'æŢřåŔ■	o	âĂŸerrorâĂŹ, âĂŸwarningâĂŹ, âĂŸdebugâĂŹ, âĂŸinfoâĂŹ ãĄőãĄĎãĄŽãĆŇãĄŃãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆçIJĄçŢěæŹĆãĄŕâĂŹinfoâĂŹãĄğåĞžåŁŻãĄŢãĆ

èľ şçt'řãĄŕãĂĄ *ãČ■ãĆřèĺ■åőŽ* ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăãĄŢãĄĎãĂĆ

åřŽãĂĄãĆşãČşãČŢãĆčãĆřãČńãČijãĆůãČğãČşãĄőãĆźãČĽãČńãČijãĆÿåőŽç¿ľãĄğ *logs*
ãĆŠæIJĽåŁźãĄńãĄŹãĆŃãĄĺãĂĄçŽ't'è£ŠãĄőåŕ¿èľśãĄğãĄőæČĚåäśãĄŃãČęãČijãĆűæŕŐãĄőãČ■ãĆřãČŢãĆąãĆď ãČńãĄńåĞžåŁŻ
ãČęãČijãĆűæŕŐãĄőãČ■ãĆřãČŢãĆąãĆď ãČńãĄőåĘĚåőźãĄŕãĂĄ*ãČĞãČŘãČČãĆřAPI*
ãĄğãĆĆåŔŰå¿ŮãĄğãĄ■ãĄ¿ãĄŹãĂĆ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ</pattern>
    <template>
        ãĄŞãĆŞãĄńãĄąãĄŕ
        <log>æŃĺæŃű</log>
    </template>
</category>

<category>
    <pattern>ãĄŢãĆĹãĄłãĆĽ</pattern>
    <template>
        ãĄŢãĆĹãĄłãĆĽ
        <log level="error">æŃĺæŃű</log>
    </template>
</category>
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕ
Output: ãĄŞãĆŞãĄńãĄąãĄŕ
âĂżãČ■ãĆřãĄńãĄŕãĂĄinfoãČńãČŹãČńãĄğâĂİæŃĺæŃűâĂİãĄĺåĞžåŁŻãĄŢãĆŇãĄęãĄĎãĆŃ
Input: ãĄŢãĆĹãĄłãĆĽ
Output: ãĄŢãĆĹãĄłãĆĽ
âĂżãČ■ãĆřãĄńãĄŕãĂĄerrorãČńãČŹãČńãĄğâĂİæŃĺæŃűâĂİãĄĺåĞžåŁŻãĄŢãĆŇãĄęãĄĎãĆŃ

éŰćéĂčéăĚçŻő: *ãČ■ãĆřèĺ■åőŽ*

6.1.31 lowercase

[1.0]

lowercaseèęĄçt'ăãĄŕãĂĄåŕ¿èśąãĄĺãĄłãĆŃæŰĞå■ŮåĹŮåĘĚãĄőå■ŁèğŠèŃśå■ŮãĆŠåřŘæŰĞå■ŮãĄńãĄŮãĄ¿ãĄŹãĂĆ
èŃśå■Ůäżěåď'ŰãĄńãĂĄåď'ğæŰĞå■ŮãČżåřŘæŰĞå■ŮãĄŃå■ŸåĬĺãĄŹãĆŃãĆőãČłãĆůãČčæŰĞå■Ůç■Ľ'ãĄńãĆĆåŕ¿å£ĬJãĄŮãĄ¿

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ * ãĄğãĄŹ</pattern>
    <template>
        ãĄŞãĆŞãĄńãĄąãĄŕ <lowercase><star /></lowercase>ãĄŢãĆŞ
    </template>
</category>
```

<lowercase />ãĄŕãĂĄ<lowercase><star /></lowercase>ãĄĺåŘŇç¿ľ'ãĄğãĄŹãĂĆæŻÿãĄ■æŔŻãĄĹãĆŃãĄĺäżěäÿŃãĄőæğŸãĄńãĄł

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ * ãĄğãĄŹ</pattern>
    <template>
        ãĄŞãĆŞãĄńãĄąãĄŕ <lowercase />ãĄŢãĆŞ
    </template>
</category>
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕ GEORGE WASHINGTON ãĄğãĄŹ
Output: ãĄŞãĆŞãĄńãĄąãĄŕ george washingtonãĄŢãĆŞ

éŰćéĂčéãĚçŻő: *uppercase*

6.1.32 map

[1.0]

mapèęĄçt'ăãĄğãĄŕãĂĄåď'ŰéČĺãČŢãĆąãĆď'ãČńãĄğæŇĞåőŽãĄŮãĄ§åď'Ľ'æŔŻè¿ðæŻÿãĄńãĆĹãĆŁãĂĄåŕ¿èśąæŰĞå■ŮåĹŮãĄő
åŕ¿èśąæŰĞå■ŮåĹŮãĄőåőŽç¿ľ'ãĄŕãĂĄãĂĄ*mapsãČŢãĆąãĆď'ãČń*
ãĄğãČŢãĆąãĆď'ãČńæŕŐãĄńãĂĄâĂŹåď'Ľ'æŔŻåŕ¿èśąæŰĞå■ŮåĹŮ: åď'Ľ'æŔŻå¿ŇæŰĞå■ŮåĹŮâĂŹ
ãĄőå¡ćåijŔãĄğåĹŮèĺŸãĄŮãĄ¿ãĄŹãĂĆ

åď'Ľ'æŔŻåŕ¿èśąæŰĞå■ŮåĹŮãĄőäÿĂèĞt'åĹd'åőŽãĄŕãĂĄèŃśå■ŮïijŽå■ŁèğŠåď'ğæŰĞå■ŮãĂĄæŢřå■ŮãČżèĺŸåŔůïijŽå■ŁèğŠãĂ
åď'Ľ'æŔŻçţŘæđIJãĄńãĄŕæŇĞåőŽãĄŢãĆŃãĄ§åď'Ľ'æŔŻå¿ŇæŰĞå■ŮåĹŮãĄŇèĺ■åőŽãĄŢãĆŃãĄ¿ãĄŹãĂĆ

åď'Ľ'æŔŻåŕ¿èśąæŰĞå■ŮåĹŮãĂĄåď'Ľ'æŔŻå¿ŇæŰĞå■ŮåĹŮãĄńãĂĄèď'ĞæŢřå■ŸèłđãĄŃãĆĽ'ãĄłãĆŃæŰĞå■ŮåĹŮãĆŠæŇĞåőŽ

åď'Ľ'æŔŻåŕ¿èśąæŰĞå■ŮåĹŮãĄőãČłãĆźãČĹãĄńäÿĂèĞt'ãĄŹãĆŃãĆĆãĄőãĄŇçĎąãĄĎåăt'åŘĹãĂĄãĆşãČşãČŢãĆčãĆřãČńãČijãĆ
default-map ãĄőåőŽç¿ľ'åĂď'ãĄŇè£ŤãĆŁãĄ¿ãĄŹãĂĆ ïijĹdefault-mapãĄŇåőŽç¿ľ'ãĄŢãĆŃãĄęãĄĎãĄłãĄĎåăt'åŘĹãĂĄçľžæŰĞå

- åśđæĂğãĂĂïijĹå■ŘèęĄçt'ăãĄğãĄőæŇĞåőŽãĆĆåŔŕèČ¡ïijĽ

ãČŠãČľãČąãČijãĆ£	ãĆ£ãĆďãČŮ	åĚĚé	ĺĹæŸŐ
name	mapåŘ■	Yes	mapsãČŢãĆąãĆď'ãČńåŘ■ãĄŃãĆĽ'æŃąåijţå■ŘãĆŠéŹď'ãĄĎãĄ§æŰĞå■ŮåĹŮãĆŠæŇĞåőŽãĄŮãĄ¿

åšđæĂğãĄgnameãĆŠæŇĞåőŽãĄŮãĄ§åăť'åŘĹãĂĄçŹżéŇšãĄŢãĆŇãĄęãĄłãĄĎãČŢãĆąãĆd'ãČńåŘ■ãĆŠæŇĞåőŽãĄŹãĆŇãĄĺãĂ

å■ŘèęĄçť'ăãĄgnameãĆŠæŇĞåőŽãĄŮãĄ§åăť'åŘĹãĂĄçŹżéŇšãĄŢãĆŇãĄęãĄłãĄĎãČŢãĆąãĆd'ãČńåŘ■ãĆŠæŇĞåőŽãĄŹãĆŇãĄĺ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>* ãĄőçIJŇåžĄæL'ĂåIJĺåIJřãĄŕïij§</pattern>
    <template>
       <map name="prefectural_office"><star/></map>ãĄğãĄźãĂĆ
    </template>
</category>
```

Input: çěđåëĹåůİçIJŇãĄőçIJŇåžĄæL'ĂåIJĺåIJřãĄŕïij§
Output: æĺłæţIJåÿĆãĄğãĄźãĂĆ

ãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşãĄő *dynamic* ãĄğ `maps` ãĄŇåőŽç¿l'ãĄŢãĆŇãĄęãĄĎãĆŃåăť'åŘĹãĂĄmapsãČŢãĆąãĆd'ãČ
`dynamic` ãĄőåőŽç¿l'ãĄŇåĎłåĚĹãĄŢãĆŇãĄ¿ãĄźãĂĆ

éŰćéĂčéăĚçŻő: *ãČŢãĆąãĆd'ãČńçőąçŘĘïijŽmaps*

6.1.33 nluintent

[custom]

nluintentèęAçt'ăãĄŕãĂĄNLUçţŘæđIJãĄőintentæČĚåăśãĆŠåŘŰå¿ŮãĄźãĆŃãĄ§ãĆĄãĄőæl'§èČ¡ãĄğãĄźãĂĆ

NLUçţŘæđIJãĄŇãĄĆãĆŃåăť'åŘĹãĄőãĄ£åĂd'ãĄŇè£ŤãĆŁãĄ¿ãĄźãĂĆå¿ŞãĄčãĄęãĂĄå§žæIJńçŽĎãĄńäžëäÿŃãĄőåd'L'æŢřãĄŕ

- patternãĄń *nluãĆ£ãĆř* ãĆŠæŇĞåőŽãĄŮãĄ§categoryãĄńãČđãČČãČĄãĄŮãĄ§åăť'åŘĹãĄńãĂĄãČ■ãČijãĆńãČńåd'L'æŢř(va
  `__SYSTEM_NLUDATA__` ãĆŠår¿èśąãĄńåĞęçŘĘãĄŮãĄ¿ãĄźãĂĆ
- templateãĄő *sraixãĆ£ãĆř* ãĄğNLUéĂŽä£ąãĆŠèąŇãĄčãĄ§åăť'åŘĹãĄńãĂĄãČ■ãČijãĆńãČńåd'L'æŢř(var):
  `__SUBAGENT_NLU__.ãĆĺãĆd'ãČłãĆćãĆźåŘ■` ãĆŠår¿èśąãĄńåĞęçŘĘãĄŮãĄ¿ãĄźãĂĆ
- NLUçţŘæđIJãĆŠäžčåĚëãĄŮãĄ§åd'L'æŢřãĆŠår¿èśąãĄńåĞęçŘĘãĄŮãĄ¿ãĄźãĂĆ

èl'şçt'řãĄŕãĂĄ *NLU* ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăãĄţãĄĎãĂĆ

- åšđæĂğ

ãČŚãČĺãČąãĆČãĆĆãĆĆãĆČŮ		å£ĚéëĺñæŸŐ	
name	ãĆd'ãČşãČĘãČşãČĹåŘ■	Yes	åŘŮå¿ŮãĄŹãĆŃãĆd'ãČşãČĘãČşãČĹåŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ * ãĄğãČŕãĆd'ãČńãČL'ãĆńãČijãČL'æL'śãĄĎãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆãČŕãĆd'ã
item	åŘŮå¿ŮãĆćãĆd'ãČĘãČăåŘ■	Yes	æŇĞåőŽãĄŮãĄ§ãĆd'ãČşãČĘãČşãČĹãĄőæČĚåăśãĆŠåŘŮå¿ŮãĄŮãĄ¿ãĄŹãĂ ãĂĄ score ãĄŁãĆĹãĄş count ãĆŠæŇĞåőŽãĄğãĄ■ãĄ¿ãĄŹãĂĆ inten- tæŇĞåőŽæŹĆãĄŕãĆd'ãČşãČĘãČşãČĹåŘ■ãĆŠåŘŮå¿ŮãĄŹãĆŃãĄŞãĄĺãĄŇã
index	ãĆd'ãČşãČĞãČČãĆŕãĆź	No	åŘŮå¿ŮãĄŹãĆŃãĆd'ãČşãČĘãČşãČĹãĄőãĆd'ãČşãČĞãČČãĆŕãĆźçŢłåŕůãĆŠ
target	åŕ¿èśąåd'L'æŢřåŘ■	No	äżżæĎŘãĄőåd'L'æŢřãĆŠåŕ¿èśąãĄĺãĄŹãĆŃåăť'åŘĹãĄńãĂĄãĄİãĄőåd'L'æŢřã __SYSTEM_NLUDATA__ ïijL'ãĂĆsraixãĄğãĄőN- LUéĂŽä£ąçţŘædIJãĆŠåŕ¿èśąãĄĺãĄŹãĆŃåăť'åŘĹãĄńãĄŕãĂĄ__SUBAGENT_ ãĆĺãĆd'ãČłãĆćãĆźåŘ■ ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
type	åd'L'æŢřçĺőåĹě	No	target ãĄőæŇĞåőŽæŹĆãĄńæIJL'åŁźãĄğãĂĄåd'L'æŢřãĄőçĺőåĹëïijŽâĂŹ- nameâĂŹ, âĂŸdataâĂŹ, âĂŸvarâĂŹ ãĄőãĄĎãĄŽãĆŃãĄŃãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹïijĹçIJĄçŢěåĂd'ãĄŕãĂĄâĂŹ

AIMLãĄőåd'L'æŢřãĆŠåĂd'ãĄĺãĄŮãĄęæŇĞåőŽãĄŹãĆŃåăť'åŘĹãĄńåšđæĂğãĄğãĄŕæŇĞåőŽãĄğãĄ■ãĄłãĄĎãĄ§ãĆĄãĂĄå■Řè

åŃŢä¡IJãĄŕåšđæĂğãĄĺåŘŇãĄŸåŃŢä¡IJãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆåŘŇãĄŸåšđæĂğåŘ■ãĂĄå■ŘèęAçt'ääŘ■ãĆŠæŇĞåőŽãĄŮãĄ§åă

- å■ŘèęAçt'ă

ãČŚãČĺãČąãĆČãĆĆãĆĆãĆČŮ		å£ĚéëĺñæŸŐ	
name	ãĆd'ãČşãČĘãČşãČĹåŘ■	Yes	åŘŮå¿ŮãĄŹãĆŃãĆd'ãČşãČĘãČşãČĹåŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ åĘĚåőźãĄńãĄd'ãĄĎãĄęãĄŕåšđæĂğãĄő- nameãĆŠåŔĆçĚğãĂĆ
item	åŘŮå¿ŮãĆćãĆd'ãČĘãČăåŘ■	Yes	æŇĞåőŽãĄŮãĄ§ãĆd'ãČşãČĘãČşãČĹãĄőæČĚåăśãĆŠåŘŮå¿ŮãĄŮãĄ¿ãĄŹãĂ
index	ãĆd'ãČşãČĞãČČãĆŕãĆź	No	åŘŮå¿ŮãĄŹãĆŃãĆd'ãČşãČĘãČşãČĹãĄőãĆd'ãČşãČĞãČČãĆŕãĆźçŢłåŕůãĆŠ

- ä¡£çŤĺä¿Ń

NLUãĄőåĞęçŘĘçţŘædIJãĄőãĆd'ãČşãČĘãČşãČĹæČĚåăśãĆŠåŘŮå¿ŮãĄŮãĄ¿ãĄŹãĂĆ
äžëäÿŃä¿ŃãĄőNLUåĞęçŘĘçţŘædIJãĄŃãĆĽãĆd'ãČşãČĘãČşãČĹãĆŠåŘŮå¿ŮãĄŹãĆŃåăť'åŘĹãĆŠèłñæŸŐãĄŮãĄ¿ãĄŹãĂĆ

```
{
    "intents": [
        {"intent": "restaurantsearch", "score": 0.9 },
        {"intent": "aroundsearch", "score": 0.4 }
    ],
    "slots": [
        {"slot": "genre", "entity": "ãĆd'ãĆ£ãČłãĆćãČş", "score": 0.95, "startOffset
↪": 0, "endOffset": 5 },
        {"slot": "genre", "entity": "ãČŢãČńãČşãČĄ", "score": 0.86, "startOffset":␣
↪7, "endOffset": 10 },
        {"slot": "genre", "entity": "äÿ■èŕŕ", "score": 0.75, "startOffset": 12,
↪"endOffset": 14 }
    ]
}
```

NLUãĄğåĞęçŘĘãĄŮãĄ§ãĆd'ãČşãČĘãČşãČĹãĆŠåŘŮå¿ŮãĄŹãĆŃåăť'åŘĹãĂĄäžëäÿŃãĄőãĆĹãĄĘãĄńèĺŸè£řãĄŮãĄ¿ãĄŹãĂĆ

```
<category>
    <pattern>
        <nlu intent="restaurantsearch"/>
```

(continues on next page)

(continued from previous page)

```
    </pattern>
    <template>
        <nluintent name="restaurantsearch" item="score" />
    </template>
</category>
```

Input: ãĆd'ãĆ£ãČłãĆćãČşãĄÑãČŢãČňãČşãČĄãĄÑäÿ■èŔŕãĆŠæŐćãĄŮãĄę
Output: 0.9ãĂĆ

sraixãĆ£ãĆŕ ãĄğN-
LUéĂŽä£ąãĆŠèąÑãĄčãĄ§çţŘæđIJãĄÑãĆL'ãĆd'ãČşãČĘãČşãČĹãĆŠåŔŰå¿ŮãĄŹãĆŃåät'åŘĹãĂĄäżëäÿÑãĄőãĆĹãĄĘãĄńèÍŸè£ì
åřŽãĂĄãĄŞãĄőåät'åŘĹãĄő *nlu_servers*
ãČŢãĆąãĆd'ãČńãĄğãĄŕãĂĄserversãĄőãĆĺãĆd'ãČłãĆćãĆźåŘ■ãĄĺãĄŮãĄęãĂĄâĂŹsomeNluâĂŹ
ãĄÑçŹżéÑšãĄŢãĆÑãĄęãĄĎãĆÑãĆĆãĄőãĄĺãĄŮãĄ¿ãĄŹãĂĆ

```
<category>
    <pattern>
        NLUéĂŽä£ą *
    </pattern>
    <template>
        <think>
            <sraix nlu="sameNlu"><star /></sraix>
        <thimk>
        <nluintent name="restaurantsearch" item="score" target="__SUBAGENT_NLU__.
↪someNlu" />
    </template>
</category>
```

Input: NLUéĂŽä£ą ãĆd'ãĆ£ãČłãĆćãČşãĄÑãČŢãČňãČşãČĄãĄÑäÿ■èŔŕãĆŠæŐćãĄŮãĄę
Output: 0.9ãĂĆ

éŰćéĂčéăĚçŻő: *NLU* ãĂĄ *NLUãĆd'ãČşãČĘãČşãČĹãĄőåŘŰå¿Ů*

6.1.34 nluslot

[custom]

nluslotèęAçt'ăăĄŕãĂĄNLUçţŘæđIJãĄőslotæČĚåăśãĆŠåŘŰå¿ŮãĄŹãĆÑãĄ§ãĆĄãĄőæl'§èČ¡ãĄğãĄŹãĂĆ

NLUçţŘæđIJãĄÑãĄĆãĆÑåät'åŘĹãĄőãĄ£åĂd'ãĄÑè£ŢãĆŁãĄ¿ãĄŹãĂĆå¿ŞãĄčãĄęãĂĄå§žæIJñçŽĎãĄńäżëäÿÑãĄőåd'L'æŢřãĄŕ

- patternãĄń *nluãĆ£ãĆŕ* ãĆŠæŇĞåőŽãĄŮãĄ§categoryãĄńãČđãČČãČĄãĄŮãĄ§åät'åŘĹãĄńãĂĄãČ■ãČijãĆńãČńåd'L'æŢř(va
  __SYSTEM_NLUDATA__ ãĆŠår¿èśąãĄńåĞęçŘĘãĄŮãĄ¿ãĄŹãĂĆ
- templateãĄő *sraixãĆ£ãĆŕ* ãĄğNLUéĂŽä£ąãĆŠèąÑãĄčãĄ§åät'åŘĹãĄńãĂĄãČ■ãČijãĆńãČńåd'L'æŢř(var):
  __SUBAGENT_NLU__.ãĆĺãĆd'ãČłãĆćãĆźåŘ■ ãĆŠår¿èśąãĄńåĞęçŘĘãĄŮãĄ¿ãĄŹãĂĆ
- NLUçţŘæđIJãĆŠäżčåĚëãĄŮãĄ§åd'L'æŢřãĆŠår¿èśąãĄńåĞęçŘĘãĄŮãĄ¿ãĄŹãĂĆ

èl'şçt'řãĄŕãĂĄ *NLU* ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăăĄŢãĄĎãĂĆ

- åśđæĂğ

ãČŚãČľäČãąĆĆąĆĆąĆĆČÙ		å£ËéëĺĺæŸÓ	
name	ãĆźãČ■ãČČãČĹåŘ■	Yes	åŘŰå¿ŮãĄŹãĆŃãĆźãČ■ãČČãČĹåŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ * ãĄğãČřãĆđ'ãČńãČĽ'ãĆńãČijãČĽæĽśãĄĐãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆãČřãĆđ'ã
item	åŘŰå¿ŮãĆćãĆđ'ãČĘãČăåŘ■	Yes	æŇĞåőŽãĄŮãĄ§ãĆźãČ■ãČČãČĹãĄőæČĚåăśãĆŠåŘŰå¿ŮãĄŮãĄ¿ãĄŹãĂĆs ãĂĄ entity ãĂĄ score ãĂĄstartOffset ãĂĄendOffset ãĄŁãĆĹãĄş count ãĆŠæŇĞåőŽãĄğãĄ■ãĄ¿ãĄŹãĂĆ slotæŇĞåőŽæŹĆãĄŕãĆźãČ■ãČČãČĹåŘ■ãĆŠåŘŰå¿ŮãĄŹãĆŃãĄŞãĄĺãĄŃãĄ countãĄŕåŘŇäÿĂãĆźãČ■ãČČãČĹåŘ■ãĄőæŢřãĆŠè£ŤãĄŮãĄ¿ãĄŹãĂĆ
index	ãĆđ'ãČşãČĞãČČãĆřãĆź	No	åŘŰå¿ŮãĄŹãĆŃãĆźãČ■ãČČãČĹãĄőãĆđ'ãČşãČĞãČČãĆřãĆźŢłåŘůãĆŠæŇ
target	åŕ¿èśąåđ'L'æŢřåŘ■	No	äžżæĎŘãĄőåđ'L'æŢřãĆŠåŕ¿èśąãĄĺãĄŹãĆŃåăť'åŘĹãĄńãĂĄãĄİãĄőåđ'L'æŢřå __SYSTEM_NLUDATA__ ïijL'ãĂĆsraixãĄğãĄőN- LUéĂŽä£ąçţŘæđIJãĆŠåŕ¿èśąãĄĺãĄŹãĆŃåăť'åŘĹãĄńãĄŕãĂĄ__SUBAGENT_ ãĆĺãĆđ'ãČłãĆćãĆźåŘ■ ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
type	åđ'L'æŢřçĺőåĹě	No	target ãĄőæŇĞåőŽæŹĆãĄńæIJL'åŁźãĄğãĂĄåđ'L'æŢřãĄőçĺőåĹěïijŽâĂŹ- nameâĂŹ, âĂŸdataâĂŹ, âĂŸvarâĂŹ ãĄőãĄĐãĄŽãĆŃãĄŃãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹïijĹçIJĄçŢěåĐđ'ãĄŕãĂĄâĂŹ

AIMLãĄőåđ'L'æŢřãĆŠåĂđ'ãĄĺãĄŮãĄęæŇĞåőŽãĄŹãĆŃåăť'åŘĹãĄńåśđæĂğãĄğãĄŕæŇĞåőŽãĄğãĄ■ãĄłãĄĐãĄ§ãĆĄãĂĄå■Řè
åŃŢä¡IJãĄŕåśđæĂğãĄĺåŘŇãĄŸåŃŢä¡IJãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆåŘŇãĄŸåśđæĂğåŘ■ãĂĄå■ŘèęĄçť'ääŘ■ãĆŠæŇĞåőŽãĄŮãĄ§åă

- å■ŘèęĄçť'ă

ãČŚãČľäČãąĆĆąĆĆąĆĆČÙ		å£ËéëĺĺæŸÓ	
name	ãĆźãČ■ãČČãČĹåŘ■	Yes	åŘŰå¿ŮãĄŹãĆŃãĆźãČ■ãČČãČĹåŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ åĘĚåőźãĄńãĄđ'ãĄĐãĄęãĄŕåśđæĂğãĄő- nameãĆŠåŘĆçĚğãĂĆ
item	åŘŰå¿ŮãĆćãĆđ'ãČĘãČăåŘ■	Yes	æŇĞåőŽãĄŮãĄ§ãĆźãČ■ãČČãČĹãĄőæČĚåăśãĆŠåŘŰå¿ŮãĄŮãĄ¿ãĄŹãĂĆåĚ
index	ãĆđ'ãČşãČĞãČČãĆřãĆź	No	åŘŰå¿ŮãĄŹãĆŃãĆźãČ■ãČČãČĹãĄőãĆđ'ãČşãČĞãČČãĆřãĆźŢłåŘůãĆŠæŇ

- ä¡£çŤĺä¿Ń

NLUãĄőåĞęçŘĘçţŘæđIJãĄőãĆźãČ■ãČČãČĹæČĚåăśãĆŠåŘŰå¿ŮãĄŮãĄ¿ãĄŹãĂĆ
äžëäÿŃä¿ŃãĄőNLUåĞęçŘĘçţŘæđIJãĄŃãĆĽ'ãĆźãČ■ãČČãČĹãĆŠåŘŰå¿ŮãĄŹãĆŃåăť'åŘĹãĆŠèłňæŸÓãĄŮãĄ¿ãĄŹãĂĆ

```
{
    "intents": [
        {"intent": "restaurantsearch", "score": 0.9 },
        {"intent": "aroundsearch", "score": 0.4 }
    ],
    "slots": [
        {"slot": "genre", "entity": "ãĆđ'ãĆ£ãČłãĆćãČş", "score": 0.95, "startOffset
↪": 0, "endOffset": 5 },
        {"slot": "genre", "entity": "ãČŢãČńãČşãČĄ", "score": 0.86, "startOffset":␣
↪7, "endOffset": 10 },
        {"slot": "genre", "entity": "äÿ■èŘŕ", "score": 0.75, "startOffset": 12,
↪"endOffset": 14 }
    ]
}
```

NLUãĄğåĞęçŘĘãĄŮãĄ§ãĆźãČ■ãČČãČĹãĆŠåŘŰå¿ŮãĄŹãĆŃåăť'åŘĹãĂĄäžëäÿŃãĄőãĆĹãĄĘãĄńèĺŸè£řãĄŮãĄ¿ãĄŹãĂĆ

```
<category>
    <pattern>
        <nlu intent="restaurantsearch"/>
    </pattern>
```

(continues on next page)

(continued from previous page)

```
    <template>
        <nluslot name="genre" item="count" />
        <nluslot name="genre" item="entity" index="0" />
        <nluslot name="genre" item="entity" index="1" />
        <nluslot name="genre" item="entity" index="2" />
    </template>
</category>
```

Input: ãĆd'ãĆ£ãČłãĆćãČşãĄÑãČŢãČňãČşãČĄãĄÑäÿ■èŘŕãĆŠæŐćãĄŮãĄę
Output: 3 ãĆd'ãĆ£ãČłãĆćãČş ãČŢãČňãČşãČĄ äÿ■èŘŕãĂĆ

sraixãĆ£ãĆŕ ãĄğN-
LUéĂŽä£ąãĆŠèąÑãĄčãĄ§çţŘædIJãĄÑãĆL'ãĆźãČ■ãČČãČĹãĆŠåŔŰå¿ŮãĄŹãĆŃåät'åŘĹãĂĄäżěäÿÑãĄőãĆĹãĄĘãĄńèÍŸè£řãĄŮ
åřŽãĂĄãĄŞãĄőåät'åŘĹãĄő *nlu_servers*
ãČŢãĆąãĆd'ãČńãĄğãĄŕãĂĄserversãĄőãĆĺãĆd'ãČłãĆćãĆźåŘ■ãĄĺãĄŮãĄęãĂĄâĂŹsomeNluâĂŹ
ãĄŇçŹżéŇšãĄŢãĆŇãĄęãĄĎãĆŃãĆĆãĄőãĄĺãĄŮãĄ¿ãĄŹãĂĆ

```
<category>
    <pattern>
        NLUéĂŽä£ą *
    </pattern>
    <template>
        <think>
            <sraix nlu="sameNlu"><star /></sraix>
        <think>
        <nluslot name="genre" item="count" target="__SUBAGENT_NLU__.someNlu" />
        <nluslot name="genre" item="entity" index="0" target="__SUBAGENT_NLU__.
↪someNlu" />
        <nluslot name="genre" item="entity" index="1" target="__SUBAGENT_NLU__.
↪someNlu" />
        <nluslot name="genre" item="entity" index="2" target="__SUBAGENT_NLU__.
↪someNlu" />
    </template>
</category>
```

Input: NLUéĂŽä£ą ãĆd'ãĆ£ãČłãĆćãČşãĄÑãČŢãČňãČşãČĄãĄÑäÿ■èŘŕãĆŠæŐćãĄŮãĄę
Output: 3 ãĆd'ãĆ£ãČłãĆćãČş ãČŢãČňãČşãČĄ äÿ■èŘŕãĂĆ

éŰćéĂčéăĚçŽő: *NLU* ãĂĄ *NLUãĆźãČ■ãČČãČĹãĄőåŔŰå¿Ů*

6.1.35 normalize

[1.0]

normalizeèęAçt'ăãĄŕãĂĄåŕ¿èśąãĄĺãĄłãĆŃæŰĞå■ŮåĹŮãĄńåŘńãĄ¿ãĆŇãĆŃèÍŸåŔůãĆĎãĂĄç§■çÿőå¡ćãĄőæŰĞå■ŮåĹŮãĆŠãĂ
åd'L'æŔŻåĘĚåőźãĄŕãĂĄ*normalãČŢãĆąãĆd'ãČń*
ãĄğæŇĞåőŽãĄŮãĂĄåd'ğæŰĞå■ŮãČżåřŔæŰĞå■ŮãĂĄåĚíèğŠãČżå■ŁèğŠãĆŠåŇžåĹěãĄŮãĄęåd'L'æŔŻãĆŠèąÑãĄĎãĄ¿ãĄŹãĂ

èŃśå■ŸèłđãĄńåŕ¿ãĄŹãĆŃåd'L'æŔŻãĄőåät'åŘĹãĂĄæŰĞå■ŮãĆŠå■Ÿä¡■ãĄĺãĄŹãĆŃåd'L'æŔŻïijĹæŰĞå■Ůåd'L'æŔŻïijL'ãĄĺãĂ

ïijĹæŮěæIJňèłđãĄőåăť'åŘĹãĂĄå■Ÿèłđåđ'L'æŔŻãĄőãĄ£ãĆŠèąŇãĄĎãĄ¿ãĄŹãĂĆïijL'

ä¿ŃãĄĹãĄřãĂĄâĂŹ.âĂŹãĆŠâĂŹdotâĂŹãĂĄâĂŹ*âĂŹãĆŠâĂŹ_âĂŹãĄńåđ'L'æŔŻãĄŹãĆŃåăť'åŘĹãĂĄâĂŹwww.***.comâĂŹã
dot _ _ _ dot comâĂŹãĄńåđ'L'æŔŻãĄŢãĆŇãĄ¿ãĄŹãĂĆ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>URLãĄŕ *</pattern>
    <template>
        <normalize><star /></normalize>ãĆŠèąĺçd'žãĄŮãĄ¿ãĄŹãĂĆ
    </template>
</category>
```

<normalize />ãĄŕãĂĄ<normalize><star /></normalize>ãĄĺåŘŇç¿l'ãĄğãĄŹãĂĆæŻÿãĄ■æŔŻãĄĹãĆŃãĄĺäžěäÿŃãĄőæğŸãĄńãĄł

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>URLãĄŕ *</pattern>
    <template>
         <normalize />ãĆŠèąĺçd'žãĄŮãĄ¿ãĄŹãĂĆ
    </template>
</category>
```

Input: URLãĄŕwww.***.com
Output: www dot _ _ _ dot com ãĆŠèąĺçd'žãĄŮãĄ¿ãĄŹãĂĆ

éŰćéĂčéăĚçŻő: *ãČŢãĆąãĆd'ãČńçőąçŘĘïijŽnormal* , *denormalize*

6.1.36 olist

[2.1]

olistïijĹordered listïijL'èęĄçt'ăãĄŕãĂĄå■ŘèęĄçt'ăãĄő *item* ãĄńèĺŸèijL'ãĄŮãĄ§èęĄçt'ăãĆŠãČłãĆźãČĹå¡ćåijŔãĄğè£ŤãĄŹãČłãČĆ
å■ŘèęĄçt'ăãĄőitemãĄńãĄŕãČłãĆźãČĹãĄőåĘĚåőźãĆŠèĺŸèijL'ãĄŹãĆŃãĄŞãĄĺãĄŇãĄğãĄ■ãĄ¿ãĄŹãĂĆãĄ¿ãĄ§ãĂĄitemãĄńlist

åŕ¿èl'śãĆĺãČşãĆÿãČşãĄğãĄŕãĂĄãČłãČČãČąãČąãČĞãĆčãĆćèęĄçt'ăãĄńåŕ¿ãĄŮãĄęãĂĄXMLå¡ćåijŔãĄőçţRædIJãĆŠè£ŤãĄŮãĄ
åő§éŽŻãĄőçŤżéÍćæŔŔçŤżç■L'ãĄŕãĂĄãĆşãČşãČŢãĆčãĆŕãČñãCijãĆůãČğãČşåőŽç¿l'ãĄőclientãĄő *renderer*
ãĄğæŇĞåőŽãĄŮãĄ§åĞęçŘĘãĆŕãČl'ãĆźãĄőåĹűå¿ąãĄńä¿Ìå■ŸãĄŮãĄ¿ãĄŹãĂĆ

- å■ŘèęĄçt'ă

ãČŚãČl'ãĆąãĆźãĆĺãĆŠãĆŤãĆĚéěĺňæŸŐ			
item	string	Yes	ãČłãĆźãČĹãĄőåĘĚåőźãĆŠèĺŸèijL'ãĄŮãĄ¿ãĄŹãĂĆ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>ãČłãĆźãČĹãĆŠèąĺçd'žãĄŮãĄę</pattern>
    <template>
         <olist>
            <item>
                 <card>
                     <image>https://searchsite.com/image0.png</image>
                     <title>Image No.1</title>
                     <subtitle>Tag olist No.1</subtitle>
```

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```
                    <button>
                        <text>Yes</text>
                        <url>https://searchsite.com:?q=yes</url>
                    </button>
                </card>
            </item>
            <item>
                <card>
                    <image>https://searchsite.com/image1.png</image>
                    <title>Image No.2</title>
                    <subtitle>Tag olist No.2</subtitle>
                    <button>
                        <text>No</text>
                        <url>https://searchsite.com:?q=no</url>
                    </button>
                </card>
            </item>
        </olist>
    </template>
</category>
```

éŰćéĂčéăĚçŻő: *item* , *card*

6.1.37 oob

[1.0]

OOBãĄŕ âĂIJOut of BandâĂİ
ãĄőçŢěãĄğãĂĄoobèęAçt’ăãĄŇèl’Ţä¿ąãĄŢãĆŇãĆŃãĄĺår¿å£IJãĄŹãĆŃåĘĚéČĺãČćãĆÿãČěãČijãČńãĄŇåĞęçŘĘãĆŠèąŇãĄĎãĂĄ

åĘĚéČĺãČćãĆÿãČěãČijãČńãĄğãĄőåĞęçŘĘãĄŕOSäÿŁãĄğãĄőæl’§åŹĺæŞ■ä¡IJãĆŠæČşåőŽãĄŮãĄęãĄŁãĆŁãĂĄçţĎãĄ£è¿ijãĄ£æl

OOBãĆŠåĞęçŘĘãĄŹãĆŃåĘĚéČĺãČćãĆÿãČěãČijãČńãĄŕãĂĄãĆůãĆźãČĘãČáéŰŃçŹžèĂĚãĄŇèĺ■èĺĹãĂĄåő§èčĚãĆŠèąŇãĄĎãĄ¿
OOB ãĆŠåŘĆçĚğãĄŮãĄęãĄŔãĄăãĄŢãĄĎãĂĆ

oobèęAçt’ăãĄőå■ŘèęAçt’ăãĄőåŘ■çğřãĄńãĂĄåĹl’çŤĺãĄŹãĆŃOOBæl’§èČ¡ãĄőè■ŸåĹěåŘ■ãĆŠæŇĞåőŽãĄŮãĂĄãĄİãĄőåĘĚåőźã

åijŢæŢřãĆŠèd’ĞæŢřæŇĞåőŽãĄŹãĆŃåăt’åŘĹãĂĄèęAçt’ăåŘ■ãĄńãĄŕAIMLãĄğä¡£çŤĺãĄŹãĆŃèęAçt’ăåŘ■ãĄĺéĞ■ãĄłãĆL’ãĄłãĄ

ãĆşãČşãČŢãĆčãĆřãČńãČijãĆůãČğãČşãĄğçŹžéŇšãĄŮãĄęãĄĎãĄłãĄĎOOBãĄőè■ŸåĹěåŘ■ãĆŠæŇĞåőŽãĄŮãĄ§ăt’åŘĹãĄńãĄ

(éĞ■èęĄïijL’

ãĂĂOOBãĄőåĞęçŘĘãĄŕãĂĄäżŰãĄőèęAçt’ăãĄĺãĄŕçŢřãĄłãĆŁãĂĄtemplateåĘĚãĄńèĺŸè£řãĄŢãĆŇãĄ§äżŰãĄőèęAçt’ăãĄőåĞęç

ãĂĂåŘĹãĂĄåő§æŰ¡ãĄğãĄ■ãĆŃOOBæl’§èČ¡ãĄŕcategoryåĘĚãĄğïijŚãĄd’ãĄőãĄ£ãĄğãĂĄèd’ĞæŢřãĄőOOBãĄőæŇĞåőŽãĆŠèą

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>DIAL *</pattern>
    <template>
```

(continues on next page)

(continued from previous page)

```
        <oob><dial><star /></dial></oob>
    </template>
</category>
```

Input: DIAL 0123-456-7890
Output: (DIAL) (è£Ťå■ť åĘĚåőźãĄŕåĘĚéČĺãČćãĆÿãČěãČijãČńãĄőåő§èčĚæňąçňň)

éŰćéĂčéăĚçŻő: *xml* ãĂĄ *OOB*

6.1.38 person

[1.0]

personèęĄçť ăãĄŕãĂĄçŹžèľśæŰĞãĄńåŘńãĄ¿ãĆŇãĆŃäÿĂäžžçğřãĄőäżčåŘ■èľđãĄĺäžŇäžžçğřãĄőäżčåŘ■èľđãĄőéŰŞãĄőåd'L'æŀ
åd'L'æŔŻåĘĚåőźãĄŕãĂĄ*personãČŢãĆąãĆd'ãČń* ãĄğæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ

åd'L'æŔŻæŰźæşŢãĄőæŇĞåőŽãĄńãĄŕåd'L'æŔŻåL'■ãĄĺåd'L'æŔŻå¿ŇãĄőãĆżãČČãČĹãĄğèĺŸèijL'ãĄŮãĂĄpersonãĄőãĆżãČČãČ

åd'L'æŔŻåŕ¿èśąãĄőåĹd'åőŽãĄŕãĂĄèŃśæŢřèĺŸåŔůïijŽå■ŁèğŠãĂĄãĆńãĆ£ãĆńãČŁïijŽåĚĺèğŠãĄńåd'L'æŔŻãĄŮãĄ§äÿŁãĄğèąŇã

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>çğĄãĄŕ * ãĆŠå¿ĚãĄčãĄęãĄĎãĄ¿ãĄŹãĂĆ</pattern>
    <template>
        ãĄĆãĄłãĄ§ãĄŕ <person><star /></person> ãĆŠå¿ĚãĄčãĄęãĄĎãĆŃãĆŞãĄğãĄŹãĄ■ãĂĆ
    </template>
</category>
```

<person />ãĄŕãĂĄ<person><star /></person>ãĄĺåŘŇç¿l'ãĄğãĄŹãĂĆæŻÿãĄ■æŔŻãĄĹãĆŃãĄĺäžëäÿŃãĄőæğŸãĄńãĄłãČŁãĄ¿ã

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>çğĄãĄŕ * ãĆŠå¿ĚãĄčãĄęãĄĎãĄ¿ãĄŹãĂĆ</pattern>
    <template>
        ãĄĆãĄłãĄ§ãĄŕ <person /> ãĆŠå¿ĚãĄčãĄęãĄĎãĆŃãĆŞãĄğãĄŹãĄ■ãĂĆ
    </template>
</category>
```

Input: çğĄãĄŕãĄĆãĄłãĄ§ãĆŠå¿ĚãĄčãĄęãĄĎãĄ¿ãĄŹãĂĆ
Output: ãĄĆãĄłãĄ§ãĄŕçğĄãĆŠå¿ĚãĄčãĄęãĄĎãĆŃãĆŞãĄğãĄŹãĄ■ãĂĆ

éŰćéĂčéăĚçŻő: *ãČŢãĆąãĆd'ãČńçőąçŘĘïijŽperson* , *person2*

6.1.39 person2

[1.0]

person2èęAçt'ããAŕãĂAçŹžèl'śæŰĞãAńåŘńãA¿ãĆŇãĆŃäÿĂäžžçğřãAőäżčåŘ■èl'đãAĺäÿL'äžžçğřãAőäżčåŘ■èl'đãAőéŰŞãAőåd'L'a
åd'L'æŔŻåĘĚåőźãAŕãĂAperson2ãČŢãĆąãĆd'ãČń ãAğæŇĞåőŽãAŲãA¿ãAŹãĂĆ

åd'L'æŔŻæŰźæşŢãAőæŇĞåőŽãAńãAŕåd'L'æŔŻåL'■ãAĺåd'L'æŔŻå¿ŇãAőãĆżãČČãČĹãAğèĺŸèijL'ãAŲãĂAperson2ãAőãĆżãČČãĆ

åd'L'æŔŻåŕ¿èśąãAőåĹd'åőŽãAŕãĂAèŃśæŢřèĺŸåŔůïijŽå■ŁèğŠãĂAąĆńãĆ£ãĆńãČŁïijŽåĚĺèğŠãAńåd'L'æŔŻãAŲãA§äÿŁãAğèąŇã

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>* ãAń * ãĆŠæŢŹãAĹãAęãAŔãAăãAŢãAĎãĂĆ</pattern>
    <template>
        <person2><star/></person2> ãAő <star index="2" /> ãAŕãAŞãĆŇãAğãAŹãĂĆ
    </template>
</category>
```

<person2 />ãAŕãĂA<person2><star /></person2>ãAĺåŘŇç¿l'ãAğãAŹãĂĆæŻÿãA■æŔŻãAĹãĆŇãAĺäžěäÿŇãAőæğŸãAńãAłãĆŁãA

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>* ãAń * ãĆŠæŢŹãAĹãAęãAŔãAăãAŢãAĎãĂĆ</pattern>
    <template>
        <person2 /> ãAő <star index="2" /> ãAŕãAŞãĆŇãAğãAŹãĂĆ
    </template>
</category>
```

Input: çğAąãAńèąŇãA■æŰźãĆŠæŢŹãAĹãAęãAŔãAăãAŢãAĎãĂĆ
Output: ãAĆãAłãA§æŰźãAőèąŇãA■æŰźãAŕãAŞãĆŇãAğãAŹãĂĆ

éŰćéĂčéăĚçŻő: *ãČŢãĆąãĆd'ãČńçőąçŘĘïijŽperson2* , *person*

6.1.40 program

[1.0]

programèęAçt'ããAŕãĂAąBotãAőãČŘãČijãĆÿãČğãČşæČĚåăśãĆŠ âĂŸãČIJãČČãČĹåŘ■ version
ãČŘãČijãĆÿãČğãČşåŘ■âĂŹ
ãAőå¡ćåijŔãAğè£ŤãAŲãA¿ãAŹãĂĆ(åŕ¿èl'śãĆĺãČşãĆÿãČşãAőãČŘãČijãĆÿãČğãČşãĆŠçd'žãAŹãĆĆãAőãAğãAŕãAĆãĆŁãA¿ãAŻã
ãČIJãČČãČĹåŘ■ãAŕãĂAądefault:âĂŹAIML botâĂŹ ãAğãĂAą *propertiesãČŢãĆąãĆd'ãČń* ãAğ
âĂŸfullnameâĂŹ ãĆŠæŇĞåőŽãAŹãĆŃãAŞãAĺãAğåd'L'æŻt'ãAğãA■ãA¿ãAŹãĂĆ
ãČŘãČijãĆÿãČğãČşåŘ■ãAŕãĂAąãĆşãČşãČŢãĆčãĆŕãČňãČijãĆůãČğãČşãAő *version* ãĆŠdefaultãAĺãAŲãĂAą
propertiesãČŢãĆąãĆd'ãČń ãAő âĂŸversionâĂŹ æŇĞåőŽãAğåd'L'æŻt'ãAğãA■ãA¿ãAŹãĂĆ

propertiesãČŢãĆąãĆd'ãČńãAőversionãAń âĂŸv1,0âĂŹ ãĆŠæŇĞåőŽãAŲãA§åät'åŘĹãAńãAŕãĂAäžěäÿŇãAőæğŸãAńãAłãĆŁãA¿

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>version</pattern>
    <template>
        <program />
```

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(continued from previous page)

```
    </template>
</category>
```

Input: version
Output: AIML bot version v1.ïijŘ

éŰćéĂčéăĚçŻő: *ãČŢãĆąãĆd'ãČńçőąçŘĘïijŽproperties*

6.1.41 random

[1.0]

randomèęAçt'ããAŕãĂAąĹLŮèÍŸãAŢãĆŇãA§ *li* å■ŘèęAçt'ããAőäÿ■ãAŃãĆĽãČľãČşãČĂãČăãAńïijŚåĂŃãĆŠéAÿãAşãĂAąãAİãAőçţ

- å■ŘèęAçt'ă

ãČŚãČľãĆãąĆãjãĆãĂĚéěĺňæŸŐ			
li	string	Yes	ãČľãČşãČĂãČăãAğåĞžåŁŻãAŹãĆŃçţŘæđIJãĆŠæŇĞåőŽãAŮãA¿ãAŹãĂĆ

- ä¡£çŤÍä¿Ń

```
<category>
    <pattern>ãAŞãĆŞãAńãAąãAŕ</pattern>
    <template>
        <random>
             <li>ãAŞãĆŞãAńãAąãAŕ</li>
             <li>äżŁæŮěãAőèŁå■ŘãAŕãAl'ãAĘãAğãAŹãAŃïij§</li>
             <li>äżŁæŮěãAőäžĹåőŽãĆŠèŁãAźãA¿ãAŮãĆĞãAĘãAŃïij§</li>
        </random>
    </template>
</category>
```

Input: ãAŞãĆŞãAńãAąãAŕ
Output: äżŁæŮěãAőäžĹåőŽãĆŠèŁãAźãA¿ãAŮãĆĞãAĘãAŃïij§
Input: ãAŞãĆŞãAńãAąãAŕ
Output: äżŁæŮěãAőèŁå■ŘãAŕãAl'ãAĘãAğãAŹãAŃïij§

éŰćéĂčéăĚçŻő: *li*

6.1.42 reply

[2.1]

replyèęAçt'ããAŕãĂAąãČłãĆČãČAąãČĞãĆčãĆćèęAçt'ããAğbuttonèęAçt'ããAńäijijãAęãAĎãA¿ãAŹãĂĆå■ŘèęAçt'ããAĺãAŮãAęã

replyãAĺbuttonãAőéAŢãAĎãAŕãĂAGUIãĆŠåĹl'çŤĺãAŻãAŽé§şåčřår¿èl'śãAŁãAl'ãAğåĹl'çŤĺãAŹãĆŃãAŞãAĺãĆŠæČşåőŽãAŮãAę

åŕ¿èľ śãĆĺãČşãĆÿãČşãĄğãĄŕãĂĄãČłãČČãČĄãČąãČĞãĆčãĆćèęĄçť ăãĄńåŕ¿ãĄŮãĄęãĂĄXMLå¡ćåijŔãĄőçţŘæđIJãĆŠè£ŤãĄŮãĄ
åő§éŽŻãĄőçŤżéİćæŔŔçŤżç■Ľ ãĄŕãĂĄãĆşãČşãČŢãĆčãĆŕãČňãČijãĆůãČğãČşåőŽç¿ľ ãĄőclientãĄő *renderer*
ãĄğæŇĞåőŽãĄŮãĄ§åĞęçŘĘãĆŕãČľ ãĆźãĄőåĽűå¿ąãĄńä¿İå■ŸãĄŮãĄ¿ãĄŹãĂĆ

- å■Řèę Ąçť ăãĂĂïijĹåśđæĂğãĄğãĄőæŇĞåőŽãĆĆåŔŕèČ¡ïijĽ

ãČŠãČľãČąãĆčãĆ¿ãČŘãĄŃåŃđãĄŇ	åĄå	éaĺňæŸŐ	
text	string	Yes	èł■ãĄ£äÿŁãĄŠãČĘãĆ■ãĆźãČĹãĆŠèĺŸèijĽ ãĄŮãĄ¿ãĄŹãĂĆïijĹçľ žæŰĞå■ŮãĆŠèĺśåőźãĄŮãĄ¿ãĄŹ
postback	string	No	åŃŢä¡IJãĆŠèĺŸèijĽ ãĄŮãĄ¿ãĄŹãĂĆãČęãČijãĆűãĄńãĄŕãĄŞãĄőãČąãČČãĆżãČijãĆÿãĄŕèęŃãĄŹãĄ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>äźŮãĆŁæŔŻãĄĹ</pattern>
    <template>
        <reply>
            <text>äźŮãĆŁæŔŻãĄĹæď'IJçť'ćãĄŮãĄ¿ãĄŹãĄŃïij§</text>
            <postback>äźŮãĆŁæŔŻãĄĹæąĹåĘĚ</postback>
        </reply>
    </template>
 </category>
```

éŰćéĂčéăĚçŽő: *button*

6.1.43 request

[1.0]

requestèęĄçť ăãĄŕãĂĄåśĕæ■ť çŢłåŔůãĆŠæŇĞåőŽãĄŹãĆŃãĄŞãĄĺãĄğåŕ¿èľ śåśĕæ■ť ãĄőäÿ■ãĄŃãĆĽèľ šå¡ŞãĄŹãĆŃåĚěåŁŻïijĹç

åĚěåŁŻæŰĞãĄŕãĂĄèŃśæŢřèĺŸåŔůãĄőå■ŁèğŠåŇŰãĄĺãĆńãĆ£ãĆńãČŁãĄőåĚĺèğŠåŇŰãĂĄãČđãČČãČĄåĞęçŘĘåŕ¿èśąåď ŰæŰČ

åśĕæ■ť çŢłåŔůãĄŕãĂĄâĂŸ0âĂŹãĄŇçŔ¿åIJĺãĄğãĂĄæŢřåĂď ãĄŇåď ğãĄ■ãĄŔãĄłãĆŃãĄżãĄľ éĄŐåŐżãĄőåśĕæ■ť ãĄńãĄłãĆŁã
1âĂŹãĆŠæŇĞåőŽãĄŹãĆŃãĄĺæIJĂåŔď ãĄőåĚěåŁŻæŰĞãĄŇåŔŰå¿ŮãĄğãĄ■ãĄ¿ãĄŹãĂĆ

èľ šå¡ŞãĄŹãĆŃåśĕæ■ť ãĄŃãĄłãĄĎåśĕæ■ť çŢłåŔůãĆŠæŇĞåőŽãĄŮãĄ§åăť åŔĹãĂĄåŔŰå¿Ůåď śæŢŮãĄĺãĄŮãĄęçľ žæŰĞå■ŮãĆ

- åśđæĂğ

ãČŠãČľãČąãĆčãĆ¿ãČŘãĄŃåŃđãĄŇ	åĄå	éaĺňæŸŐ	
index	string	No	åśĕæ■ť çŢłåŔůãĆŠæŢť æŢřåĂď ãĄğæŇĞåőŽãĂĆæIJłæŇĞåőŽæŹĆãĄŕ âĂŸ1âĂŹãĂĆ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>ãĄłãĆşãĄęèĺĂãĄČãĄ§ãĄČãĄŚïij§</pattern>
    <template>
         <request index="2" />ãĂĄ
         <request index="1" />ãĂĄ
         <request index="0" />ãĂĄ
         ãĄĺèĺĂãĄĎãĄ¿ãĄŮãĄ§ãĂĆ
    </template>
</category>
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕ
Output: ãĄŞãĆŞãĄńãĄąãĄŕ
Input: ãĆĆãĄĘåďIJãĄăãĄ■
Output: ãĄŞãĆŞãĄřãĆŞãĄŕ
Input: ãĄłãĆŞãĄęèÍĂãĄčãĄ§ãĄčãĄŚïij§
Output:
ãĄŞãĆŞãĄńãĄąãĄŕãĂĄãĆĆãĄĘåďIJãĄăãĄ■ãĂĄãĄłãĆŞãĄęèÍĂãĄčãĄ§ãĄčãĄŚïij§ãĂĄãĄÍèÍĂãĄĎãĄ¿ãĄŮãĄ§ãĂĆ

<request />ãĄŕãĂĄ<request index=âĂİ1âĂİ />ãĄÍåŘŇç¿ľãĄğãĄŹãĂĆæŻÿãĄ■æŔŻãĄĹãĆŃãĄÍäżëäÿŃãĄőæğŸãĄńãĄłãĆŁãĄ¿ã

- ä¡£çŤÍä¿Ń

```
<category>
    <pattern>ãĄłãĆŞãĄęèÍĂãĄčãĄ§ãĄčãĄŚïij§</pattern>
    <template>
          <request />ãĂĄãĄÍèÍĂãĄĎãĄ¿ãĄŮãĄ§ãĂĆ
    </template>
</category>
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕ
Output: ãĄŞãĆŞãĄńãĄąãĄŕ
Input: ãĄłãĆŞãĄęèÍĂãĄčãĄ§ãĄčãĄŚïij§
Output: ãĄŞãĆŞãĄńãĄąãĄŕãĂĄãĄÍèÍĂãĄĎãĄ¿ãĄŮãĄ§ãĂĆ

éŰćéĂčéăĚçŻő: *response*

6.1.44 resetlearn

[2.x]

resetlearnèęĄçť'ăãĄŕãĂĄãČąãČćãČłäÿŁãĄő *learn* èęĄçť'ă. *learnf*
èęĄçť'ăãĄğçŹžéŇšãĄŢãĆŇãĄ§ãČęãČijãĆűåŽžæIJL'ãĄőcategoryãĆŠåĚÍãĄęåL'ŁéŹd'ãĄŮãĄ¿ãĄŹãĂĆ

resetlearnãĄğãĄŕãĂĄlearnfèęĄçť'ăãĄğä¡IJæĹŘãĄŮãĄ§ãČŢãĆąãĆd'ãČńãĆŠåL'ŁéŹd'ãĄŮãĄłãĄĎçĆžãĂĄåĘ■èţůåŃŢæŹĆãĄńle

resetlearnãĆŠåő§èąŇãĄŹãĆŃãĄŞãĄÍãĄğãĂĄä¡£çŤÍäÿ■ãĄőcategoryæŢřãĄŕåĹİæIJ§ãČ■ãČijãČL'ãĄŮãĄ§categoryæŢřãĄńæĹżãĆ
åřŽãĂĄresetlearnèęĄçť'ăãĄőçţŘæđIJãĄŕãĂĄåÿÿãĄńçľžæŰĞå■ŮãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

- ä¡£çŤÍä¿Ń

```
<category>
    <pattern>çğĄãĄőèÍĂãĄčãĄ§ãĄ§ãĄÍãĆŠå£ŸãĆŃãĄęãĂĆ</pattern>
    <template>
         <think><resetlearn /></think>
         ãĆŔãĄŃãĆŁãĄ¿ãĄŮãĄ§ãĂĆæőŃå£ţãĄğãĄŹãĄŃå£ŸãĆŃãĄ¿ãĄŹãĂĆ
    </template>
</category>
```

éŰćéĂčéăĚçŻő: *learn*, *learnf*, *resetlearnf*

6.1.45 resetlearnf

[2.x]

resetlearnfèęAçť ăãAŗfãĂĄ*learn* èęAçť ă. *learnf*
èęAçť ăãAğçŹżéŇšãAŢãĆŇãA§ãČęãČijãĆűåŽžæIJL ãAőcategoryãĆŠåĚĺãAęåL'ŁéŹd'ãAŮãA¿ãAŹãĂĆ

resetlearnãAĺãAőåůőãAŗfãĂĄlearnfèęAçť ăãAğä¡IJæĹŘãAŮãA§ãČŢãĆąãĆd'ãČńãĆŠåŘńãĆAãAęåL'ŁéŹd'ãAŹãĆŇçĆźãAğãAŹãĂ

resetlearnfãĆŠåő§èąŇãAŹãĆŇãAŞãAĺãAğãĂĄä¡£çŤĺäÿ■ãAőcategoryæŢřãAŗåĹIæIJ§ãČ■ãČijãČL'ãAŮãA§categoryæŢřãAńæĹżãĆ
åřŽãĂĄresetlearnfèęAçť ăãAőçţŘæđIJãAŗfãĂĄåÿÿãAńçl'žæŰĞå■ŮãAńãAłãĆŁãA¿ãAŹãĂĆ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>çğĄãĂőèÍÃãĄčãĄ§ãĄ§ãĄÍãĆŠå£ŸãĆŇãAęãĂĆ</pattern>
    <template>
         <think><resetlearnf /></think>
         ãĆŘãĄŇãĆŁãA¿ãAŮãĄ§ãĂĆæőNå£ţãAğãAŹãAŇå£ŸãĆŇãA¿ãAŹãĂĆ
    </template>
</category>
```

éŰćéĂčéăĚçŻő: *learn*, *learnf*, *resetlearn*

6.1.46 response

[1.0]

responseèęAçť ăãAŗfãĂĄåśěæ■t'çŢłåŔůãĆŠæŇĞåőŽãĄŹãĆŇãĄŞãĄĺãAğåŕ¿èl'śåśěæ■t'ãAőäÿ■ãĄŇãĆL'èl'šå¡ŞãĄŹãĆŇåĞžåŁŻïijĺ

åśěæ■t'çŢłåŔůãAŗfãĂĄâĂŸ0âĂŹãĄŇçŔ¿åIJĺïijĹæIJłçćžåőŽãAőçĆžãĂĄæŇĞåőŽäÿ■åŔŕïijL'ãAğãĂĄæŢřåĂd'ãĄŇåd'ğãĄ■ãĄŔãA
1âĂŹãĆŠæŇĞåőŽãĄŹãĆŇãĄĺæIJĂåŔd'ãAőåĞžåŁŻæŰĞãĄŇåŔŰå¿ŮãAğãA■ãA¿ãAŹãĂĆ

èl'šå¡ŞãĄŹãĆŇåśěæ■t'ãĄŇãAłãĄĐåśěæ■t'çŢłåŔůãĆŠæŇĞåőŽãAŮãA§åät'åŘĹãĂĄåŔŰå¿Ůåd'śæŢŮãAĺãAŮãAęçl'žæŰĞå■ŮãĆ

- åśđæĂğ

| ãČŚãČľãĆąãĆąãĆą

Output: ãĄŞãĆŞãĄńãĄąãĄŕ
Input: ãĆĆãĄĘåďIJãĄăãĄ■
Output: ãĄŞãĆŞãĄřãĆŞãĄŕ
Input: åŘŻãĄŕãĄłãĆŞãĄęèÍÃãĄčãĄ§ãĄčãĄŚïij§
Output: ãĄŞãĆŞãĄńãĄąãĄŕãĂĄãĄŞãĆŞãĄřãĆŞãĄŕãĂĄãĄÍèÍĂãĄĎãĄ¿ãĄŮãĄ§ãĂĆ

<response />ãĄŕãĂĄ<response index=âĂİ1âĂİ />ãĄÍåŘŇç¿l'ãĄğãĄŹãĂĆæŻÿãĄ■æŔŻãĄĹãĆŃãĄÍäżëäÿŃãĄőæğŸãĄńãĄłãĆŁãA

- ä¡£çŤÍä¿Ń

```
<category>
    <pattern>åŘŻãĄŕãĄłãĆŞãĄęèÍÃãĄčãĄ§ãĄčãĄŚïij§</pattern>
    <template>
          <response /> ãĂĄãĄÍèÍĂãĄĎãĄ¿ãĄŮãĄ§ãĂĆ
    </template>
</category>
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕ
Output: ãĄŞãĆŞãĄńãĄąãĄŕ
Input: åŘŻãĄŕãĄłãĆŞãĄęèÍÃãĄčãĄ§ãĄčãĄŚïij§
Output: ãĄŞãĆŞãĄńãĄąãĄŕãĂĄãĄÍèÍĂãĄĎãĄ¿ãĄŮãĄ§ãĂĆ

éŰćéĂčéăĚçŻő: *request*

6.1.47 rest

[2.0]

restèęAçť'ããĄŕãĂĄèd'ĞæŢřå■ŸèłđãĄŃãĆL'ãĄłãĆŃæŰĞå■ŮåĹŮãĄńår¿ãĄŮãĄęãĂĄæIJĂåĹİäżěåd'ŰãĄőå■ŸèłđåĹŮãĆŠè£ŤãA
(æŰĞå■ŮåĹŮãĄőå■ŸèłđåĹĘåL'šæŹĆãĄńãĄŕãĂĄ *punctuation_chars*
ãĄőæŇĞåőŽãĄńãĆĹãĆŃçL'źåőŽæŰĞå■ŮéŹd'åd'ŰãĄőåĞęçŘĘãĆŠèąŇãĄĎãĄ¿ãĄŹãĂĆ)
åŔŰå¿ŮãĄńåd'śæŢŮãĄŮãĄ§åăť'åŘĹãĄŕãĂĄãĆşãĆşãĆŢãĆčãĆřãČňãCijãĆůãČğãČşåőŽç¿l'ãĄő *default-get*
ãĄőåĂd'ãĄŇè£ŤãĆŁãĄ¿ãĄŹãĂĆ
ä¿ŃãĄĹãĄŕãĂĄâĂİåśśçŤř åd'łéČŐâĂİãĄőåăť'åŘĹãĂĄâĂİåd'łéČŐâĂİãĄŇè£ŤãĆŁãĄ¿ãĄŹãĂĆ

åřŽãĂĄçţŘæđIJãĄőå■ŸèłđåĹŮãĄŕãĂĄæŮěæIJňèłđãĄőåăť'åŘĹãĄğãĆĆçl'žçŹ¡åŇžåĹĞãĆŁãĄğè£ŤãĆŁãĄ¿ãĄŹãĂĆ

- ä¡£çŤÍä¿Ń

```
<category>
    <pattern>çğĄãĄőåŘ■åL'■ãĄŕ * ãĄğãĄŹ</pattern>
    <template>
        ãĄĆãĄłãĄ§ãĄőåŘ■åL'■ãĄŕ<rest><star /></rest>ãĄŢãĆŞãĄğãĄŹãĄ■
    </template>
</category>
```

Input: çğĄãĄőåŘ■åL'■ãĄŕ åśśçŤř åd'łéČŐ ãĄğãĄŹ
Output: ãĄĆãĄłãĄ§ãĄőåŘ■åL'■ãĄŕåd'łéČŐãĄŢãĆŞãĄğãĄŹãĄ■

RDFãČŁãČňãČČãĆÿãČŹãČijãĆźãĄőæď˙IJçţ˙ćçţŘæđIJãĄńéĄľçŤĺãĄŮãĄ§åăţ˙åŘĹãĂĄçţŘæđIJãČłãĆźãČĹĺĘĕãĄőåĚĹéă■äžěåď˙Ú
èľşçţ˙řãĄŕãĂĄ*RDFãĆţãČİäČijãČĹ* ãĆŠåŔĆçĚğãĄŮãĄęãĄŘãĄăãĄŢãĄĎãĂĆ
JSONå¡ćåijŔãĄőãČĞãČijãĆ£ãĄńãĄŕår¿å£IJãĄŮãĄęãĄĎãA¿ãĄŻãĆŞãĂĆ

firstèęĄçţ˙ăãĄĺrestèęĄçţ˙ăãĆŠãĂĄconditionèęĄçţ˙ăåĘĚãĄğä¡£çŤĺãĄŹãĆŃãĄŞãĄĺãĄğãĂĄå■ŸèłđæŕőãĄőåĞęçŘĘãĆŠçźřãĆŁè£Ť
âĂIJunknownâĂİ ãĄőåŔŰå¿ŮãĄğçţĆäžĘãĄŮãĄ¿ãĄŹïijL˙ãĂĆ

ïijĹä¡ĘãĄŮãĂĄæIJńåĞęçŘĘãĄŕå■Ÿèłđå Ĺ Ęèğčçţ Ř æđIJãĄńä¿Ìå■ŸãĄŮãĄ¿ãĄŹãĂĆåŔĹãĂĄconditionãĄğãĄőloopåĞęçŘĘãĄńãA

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>å■Ÿèłđåś Ţé ŰŃ *</pattern>
    <template>
        <think>
            <set var="WORDS"><star /></set>
        </think>
        <condition var="WORDS">
            <li value="unknown" />
            <li>
                "<first><get var="WORDS" /></first>"
                <think>
                    <set var="WORDS"><rest><get var="WORDS" /></rest></set>
                </think>
                <loop />
            </li>
        </condition>
    </template>
</category>
```

Input: å■Ÿèłđåś Ţé ŰŃ apple orange grape
Output: âĂIJappleâĂİ âĂIJorangeâĂİ âĂIJgrapeâĂİãĂĆ

éŰćéĂčéăĚçŻő: *first*

6.1.48 set

[1.0]

templateåĘĚãĄősetèęĄçţ˙ăãĄğãĄŕãĂĄãĆřãČ■ãČijãČŘãČńåď˙L˙æŢřãĄĺãČ■ãČijãĆńãČńåď˙L˙æŢřãĄőèĺ■åőŽãĆŠèąÑãĄĘãĄŞãĄĺãA
get ãĆŠåŔĆçĚğãĄŮãĄęãĄŘãĄăãĄŢãĄĎãĂĆ

JSONå¡ćåijŔãĆĎãČłãĆźãČĹå¡ćåijŔãĄőãČĞãČijãĆ£ãĆĆæŰĞå■ŮåĹŮãĄĺãĄŮãĄęæŇĞåőŽãĄŹãĆŃãĄŞãĄĺãĄğãĂĄsetèęĄçţ˙ăãA

setèęĄçţ˙ăãĄőçţŘæđIJãĄńãĄŕãĂĄèĺ■åőŽãĄŮãĄŞåĂď˙ãĄŇè£ŤãĆŁãA¿ãĄŹãĂĆå£IJç■ŤæŰĞãĄńåŔ■æŸăãĄŢãĆŃãĄłãĄĎæğŸãA
ãĆŠåĹľçŤĺãĄŮãĄęãĄŘãĄăãĄŢãĄĎãĂĆ

ãĆřãČ■ãČijãČŘãČńåď˙L˙æŢř(name/data)ãĄńãĄď˙ãĄĎãĄęãĄŕãĂĄåĹľçŤĺåŔŕèČ¡ãĄłåď˙L˙æŢřãĄőçůŔæŢřãĄŇãĆşãČşãČŢãĆčãĆřã

åĽűéŹŘåĂď'åőŽç¿ľ ãĄő max_properties ãĄğåĽűéŹŘãĄŢãĆŃãĄ¿ãĄŹãĂĆ

åĽűéŹŘæŢřãĄńéĄŤãĄŮãĄ§çŁűæĚŃãĄğæŰřèęŔçŹżéŇšãĆŠèąŇãĄčãĄ§åäť'åŘĹãĄńãĄŕãĂĄåĞęçŘĘä¿Ňåď'ŰãĄŇçŹžçŤ§ãĄŮãĄ
defaultsãČŢãĆąãĆď'ãČń
ãĄğåĹİæIJ§èÍ■åőŽãĄŹãĆŃãĆřãČ■ãČijãČŘãČńåď'Ľ'æŢř(name)ãĄńãĄď'ãĄĎãĄęãĄŕåĚÍãĄęçŹżéŇšãĄŢãĆŃãĄ¿ãĄŹãĄŇãĂĄåĽİ

åď'Ľ'æŢřãĆŠåĽ'ŁéŹď'ãĄŹãĆŃãĄńãĄŕãĂĄsetèęĄçť'ãăĄőèÍ■åőŽåĂď'ãĄńçľ'žæŰĞå■ŮãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆïijĹãĆřãČ■ãČ
ãĄő deleteVariable æŇĞåőŽãĄğåĽ'ŁéŹď'ãĄŹãĆŃãĄŞãĄÍãĆĆãĄğãĄ■ãĄ¿ãĄŹãĂĆïijĽ
ä¡ĘãĄŮãĂĄãĆřãČ■ãČijãČŘãČńåď'Ľ'æŢř(name)ãĄő âĂŸtopicâĂŹ
ãĄŕåĽ'ŁéŹď'ãĄğãĄ■ãĄłãĄĎåď'Ľ'æŢřãĄÍãĄŮãĄęãĂĄçľ'žæŰĞå■ŮãĆŠæŇĞåőŽãĄŮãĄęãĆĆ âĂŸ*âĂŹ
ãĄŇèÍ■åőŽãĄŢãĆŃãĄ¿ãĄŹãĂĆ

- åśđæĂğãĂĂïijĹå■Řèę́ĄçťăãĄğãĄőæŇĞåőŽãĆĆåŔŕèČ¡ïijĽ

ãČŠãČľãČąãČ¡ãČ£	ãĆ£ãĆď'ãČŮ	å£Ěé·L	èłňæŸŐ
name	åď'Ľ'æŢř	å■Ř	No	ãĆřãČ■ãČijãČŘãČńåď'Ľ'æŢř(name)å■ŘãĆŠæŇĞåőŽ
var	åď'Ľ'æŢř	å■Ř	No	ãČ■ãČijãĆńãČńåď'Ľ'æŢř(var)å■ŘãĆŠæŇĞåőŽ
data	åď'Ľ'æŢř	å■Ř	No	ãĆřãČ■ãČijãČŘãČńåď'Ľ'æŢř(data)å■ŘãĆŠæŇĞåőŽ

setèęĄçť'ãăĄÍãĄŮãĄęãĂĄåśđæĂğãČżå■Řèę́ĄçťăãĄğãĂĄvar, name, data
ãĄőãĄĎãĄŽãĆŃãĄŇãĄŇèÍ■åőŽãĄŢãĆŃãĄęãĄĎãĆŃå£ĚèęĄãĄŇãĄĆãĆŁãĄ¿ãĄŹãĂĆ

èď'ĞæŢřãĄőåśđæĂğãĂĄå■Řèę́ĄçťăãĆŠæŇĞåőŽãĄŮãĄ§åäť'åŘĹãĄńãĄŕãĂĄäÿ■æ■čæŇĞåőŽãĄÍãĄŮãĄęãĆůãČŁãČłãĆłãĄŕçĎ

åřŽãĂĄåď'Ľ'æŢřå■ŘãČżèÍ■åőŽåĂď'ãĄÍãĆĆãĂĄåď'ğæŰĞå■ŮãČżåřŔæŰĞå■ŮãĂĄåĚÍèğŠãČżå■ŁèğŠãĆŠåŇžåĹěãĄŮãĄęçőąçŘĘ

- ä¡£çŤÍä¿Ń

```
<!-- ãĆřãČ■ãČijãČŘãČńåď'Ľ'æŢř -->
<category>
    <pattern>MY NAME IS *</pattern>
    <template>
        <set name="myname"><star /></set>
    </template>
</category>

<!-- ãČ■ãČijãĆńãČńåď'Ľ'æŢř -->
<category>
    <pattern>MY NAME IS *</pattern>
    <template>
        <set var="myname"><star /></set>
    </template>
</category>
```

éŰćéĂčéăĚçŻő: *get*

6.1.49 select

[2.0]

selectèęĄçť'ãăĄŕRDFãĄőæď'IJçť'ćãĄńä¡£çŤÍãĄŹãĆŃèęĄçť'ãăĄğãĂĄèţůåŃŢæŹĆãĄńåśŢéŰŃãĄŹãĆŃRDFãČŢãĆąãĆď'ãČńãĄő
ãĄğè£¡åŁăãĄŢãĆŃãĄ§RDFãČŁãČňãČČãĆÿãČŹãČijãĆźãĆŠåŕ¿èśąãĄńæď'IJçť'ćãĆŠèąŇãĄĎãĂĄèľ'šå¡ŞãĄŹãĆŃæČĚåăśãĆŠåŔŰ

selectèęĄçť'ããĄğãĄőæď'IJçť'ćãĄŕãĂĄèĆŕåőŽæď'IJçť'ćãĆŠèąŇãĄĘãĆŕãĆÍãČłãĄÍåŘęåőŽæď'IJçť'ćãĆŠèąŇãĄĘãĆŕãĆÍãČłãĄŇæŇĞ

åŔĹãĂĄæď'IJçť'ćçŤÍåď'Ľ'æŢřãĆŠåĹľçŤÍãĄŹãĆŇãĄŞãĄÍãĄğãĂĄãĆŕãĆÍãČłéŰŞãĄğåĚśéĂŽãĄŹãĆŇåĂď'ãĆŠæď'IJçť'ćåŕ¿èśąãĄÍ
âĂŸ?âĂŹ ãĆŠäżŸäÿŐãĄŮãĄ¿ãĄŹãĂĆ

(ãĆŕãĆÍãČłãĆŠåĹŮèĺŸãĄŮãĄ§åăť'åŔĹãĄğãĂĄåĚĹèąŇãĄŹãĆŇãĆŕãĆÍãČłãĄőçţŘæđIJãĄŇå¿ŇçűŽãĄőãĆŕãĆÍãČłãĄőçţŘæđIJãĆ
èľ'şçť'řãĄŕ *RDFãĆţãČĺãČijãČĹ* ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄäãĄŢãĄĎãĂĆ

- å■Řèę'Ąçť'ã

ãČŠãČł	ãČąãČijãĆ	ãĆ£ãĆď'ãČŮ	ãĆĘéâĹ	æŸŐ
vars		åď'Ľ'æŢřåŘ■ãČłãĆźãČĹ		ãĄŹãĆŇæď'IJçť'ćçŤÍåď'Ľ'æŢřåŘ■ãĆŠçľ'žçŹ¡åŇžåĹĞãĆŁãĄğåĹŮèĺŸ
q			No	èĆŕåőŽæď'IJçť'ćãĆŠãĄŹãĆŇãĆŕãĆÍãČłãĄőæŇĞåőŽ
	subj	string	No	æď'IJçť'ćåŕ¿èśąãĄősubject (äÿżèłđ)ãĄőåĂď'ãĂĄåŔĹãĄŕãĂĄæď'IJçť'ćçŤÍåď'Ľ'æŢřåŘ■ãĆŠæŇ
	pred	string	No	æď'IJçť'ćåŕ¿èśąãĄőpredicate (è£řèłđ)ãĄőåĂď'ãĂĄåŔĹãĄŕãĂĄæď'IJçť'ćçŤÍåď'Ľ'æŢřåŘ■ãĆŠa
	obj	string	No	æď'IJçť'ćåŕ¿èśąãĄőobject (çŻőçŽĎèłđ)ãĄőåĂď'ãĂĄåŔĹãĄŕãĂĄæď'IJçť'ćçŤÍåď'Ľ'æŢřåŘ■ãĆ
notq			No	åŘęåőŽæď'IJçť'ćãĆŠãĄŹãĆŇãĆŕãĆÍãČłãĄőæŇĞåőŽãĂĆå■Řèę'Ąçť'ãæŇĞåőŽãĄńåŕ¿ãĄŮãĄ ANDæİąäżűãĄğåĞęçŘĘãĄŮãĄ¿ãĄŹãĂĆ
	subj	string	No	æď'IJçť'ćåŕ¿èśąåď'ŰãĄősubject (äÿżèłđ)ãĄőåĂď'ãĂĄåŔĹãĄŕãĂĄæď'IJçť'ćçŤÍåď'Ľ'æŢřåŘ■ãĆ
	pred	string	No	æď'IJçť'ćåŕ¿èśąåď'ŰãĄőpredicate (è£řèłđ)ãĄőåĂď'ãĂĄåŔĹãĄŕãĂĄæď'IJçť'ćçŤÍåď'Ľ'æŢřåŘ■ã
	obj	string	No	æď'IJçť'ćåŕ¿èśąåď'ŰãĄőobject (çŻőçŽĎèłđ)ãĄőåĂď'ãĂĄåŔĹãĄŕãĂĄæď'IJçť'ćçŤÍåď'Ľ'æŢřåŘ

selectèę'Ąçť'ããĄńãĄŕãĂĄå■Řèę'Ąçť'ããĄÍãĄŮãĄęãĂĄqãĂĄåŔĹãĄŕãĂĄ`notq`
ãĄŇïijŠãĄď'ãĄŕå£ĚèęĄãĄğãĄŹãĂĆåŔĹãĂĄãĆŕãĆÍãČłéŰŞãĄğåď'Ľ'æŢřãĆŠåĚśæIJĽãĄŹãĆŇåăť'åŔĹãĂĄ`vars`
å■Řèę'Ąçť'ããĆĆå£ĚéâĹãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ
âĂŸqâĂŹãĂĄâĂŹnotqâĂŹ ãĄőå■Řèę'Ąçť'ããĄńãĄď'ãĄĎãĄęãĆĆãĂĄ`subj`ãĂĄ`pred`ãĂĄ`obj`
ãĄőãĄĎãĄŽãĆŇãĄŃïijŠãĄď'ãĄŇæIJĂä¡ŐéŹŘå£ĚèęĄãĄğãĄŹãĂĆåŘŇäÿĂå■Řèę'Ąçť'ããĄŇèď'ĞæŢřæŇĞåőŽãĄŢãĆŇãĄ§åăť'åŔ

ãĆŕãĆÍãČłåĘĚãĄğãĂĄâĂŹsubjâĂŹãĂĄâĂŹpredâĂŹãĂĄâĂŹobjâĂŹãĄőæŇĞåőŽãĆŠçIJĄçŢěãĄŮãĄ§åăť'åŔĹãĂĄçIJĄçŢěãĄŢ

äżěäÿŃãĄőä¿ŃãĄğãĄŕãĂĄRDFãČŁãČňãČČãĆÿãČŹãČijãĆźãĄńåŕ¿ãĄŮãĄęãĂĄpredicate=âĂİlegsâĂİ,
object=âĂİ4âĂİ ãĆŠæŇĞåőŽãĄŮãĄ§æď'IJçť'ćãĆŠèąŇãĄčãĄęãĂĄsubject(åď'Ľ'æŢřåŘ■:âĂŹ?nameâĂŹ)
ãĄőäÿĂèęğãĆŠåŔŰå¿ŮãĄŮãĄęãĄĎãĄ¿ãĄŹãĂĆ

æď'IJçť'ćçţŘæđIJãĄŕåď'Ľ'æŢřåŘ■ãĄÍåĂď'ãĄőãČłãĆźãČĹå¡ćåijŔãĄğèÍ■åőŽãĄŢãĆŇãĂĄå§žæIJňçŽĎãĄńRDFãČĞãČijãĆ£æŕŐãĄ
æď'IJçť'ćçţŘæđIJãĄŇãĄłãĄŃãĄčãĄ§åăť'åŔĹãĄńãĄŕãĂĄãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşåőŽç¿ľ'ãĄő
default-get ãĄőåĂď'ãĄŇè£ŤãĆŁãĄ¿ãĄŹãĂĆ

- ä¡£çŤÍä¿Ń

```
<category>
    <pattern>* æIJňèűşãĄőåŃŢçĽ'l'ãĄŕïij§</pattern>
    <template>
        <select>
             <vars>?name</vars>
             <q><subj>?name</subj><pred>legs</pred><obj><star/></obj></q>
        </select>
    </template>
</category>
```

Input: 4 æIJňèűşãĄőåŃŢçĽľ'ãĄŕïij§

Output: [[[âĂIJ?nameâĂİ, âĂIJZEBRAâĂİ]], [[âĂIJ?nameâĂİ, âĂIJLIONâĂİ]], [[âĂIJ?nameâĂİ, âĂIJELEPHANTâĂİ]]]

æňąãĄőä¿ÑãĄğãĄŕãĂĄRDFãČŁãČňãČČãĆÿãČŹãČijãĆźãĄńåŕ¿ãĄŮãĄęãĂĄpredicate=âĂİlegsâĂİ ãĆŠæŇĞåőŽãĄŮãĄ§æďIJçť´ćãĆŠèąŇãĄčãĄęãĂĄsubject(åďĽæŢřåŘ■:âĂŹ?nameâĂŹ) ãĄĺ object(åďĽæŢřåŘ■:âĂŹ?numberâĂŹ) ãĄőäÿĂèęğãĆŠåŔŰå¿ŮãĄŮãĄęãĄĎãĄ¿ãĄŹãĂĆ åĞžåŁŻçţŘæđIJãĄŕãĂĄRDFãČĞãČijãĆ£æŕŐãĄń âĂŸsubjectâĂŹ ãĄĺ âĂŸobjectâĂŹ ãĄÑãĄ¿ãĄĺãĆĄãĆĽ´ãĆŇãĄ§å¡ćãĄğãČłãĆźãČĹãĄńæäijçť■ãĄŢãĆŇãĄęãĄĎãĄ¿ãĄŹãĂĆ

```
<category>
    <pattern>åŃŢçL’l’ãĄőèűşãĄŕïij§</pattern>
    <template>
     <select>
         <vars>?name ?number</vars>
         <q><subj>?name</subj><pred>legs</pred><obj>?number</obj></q>
     </select>
    </template>
</category>
```

Input: åŃŢçL’l’ãĄőèűşãĄŕïij§

Output: [[[âĂIJ?nameâĂİ, âĂIJANTâĂİ], [âĂIJ?numberâĂİ, âĂIJ6âĂİ]], [[âĂIJ?nameâĂİ, âĂIJBATâĂİ], [âĂIJ?numberâĂİ, âĂIJ2âĂİ]], [[âĂIJ?nameâĂİ, âĂIJLIONâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]], [[âĂIJ?nameâĂİ, âĂIJPIGâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]], [[âĂIJ?nameâĂİ, âĂIJELEPHANTâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]], [[âĂIJ?nameâĂİ, âĂIJPERSONâĂİ], [âĂIJ?numberâĂİ, âĂIJ2âĂİ]], [[âĂIJ?nameâĂİ, âĂIJBEEâĂİ], [âĂIJ?numberâĂİ, âĂIJâĂİ]], [[âĂIJ?nameâĂİ, âĂIJBUFFALOâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]], [[âĂIJ?nameâĂİ, âĂIJANIMALâĂİ], [âĂIJ?numberâĂİ, âĂIJLegsâĂİ]], [[âĂIJ?nameâĂİ, âĂIJFROGâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]], [[âĂIJ?nameâĂİ, âĂIJPENGUINâĂİ], [âĂIJ?numberâĂİ, âĂIJ2âĂİ]], [[âĂIJ?nameâĂİ, âĂIJDUCKâĂİ], [âĂIJ?numberâĂİ, âĂIJ2âĂİ]], [[âĂIJ?nameâĂİ, âĂIJBIRDâĂİ], [âĂIJ?numberâĂİ, âĂIJ2âĂİ]], [[âĂIJ?nameâĂİ, âĂIJMONKEYâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]], [[âĂIJ?nameâĂİ, âĂIJGOOSEâĂİ], [âĂIJ?numberâĂİ, âĂIJ2âĂİ]], [[âĂIJ?nameâĂİ, âĂIJFOXâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]], [[âĂIJ?nameâĂİ, âĂIJKANGAROOâĂİ], [âĂIJ?numberâĂİ, âĂIJ2âĂİ]], [[âĂIJ?nameâĂİ, âĂIJDOGâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]], [[âĂIJ?nameâĂİ, âĂIJCOWâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]], [[âĂIJ?nameâĂİ, âĂIJSHEEPâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]], [[âĂIJ?nameâĂİ, âĂIJFISHâĂİ], [âĂIJ?numberâĂİ, âĂIJ0âĂİ]], [[âĂIJ?nameâĂİ, âĂIJOXâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]], [[âĂIJ?nameâĂİ, âĂIJDOLPHINâĂİ], [âĂIJ?numberâĂİ, âĂIJ0âĂİ]], [[âĂIJ?nameâĂİ, âĂIJBEARâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]], [[âĂIJ?nameâĂİ, âĂIJWOLFâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]], [[âĂIJ?nameâĂİ, âĂIJZEBRAâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]], [[âĂIJ?nameâĂİ, âĂIJCATâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]], [[âĂIJ?nameâĂİ, âĂIJWHALEâĂİ], [âĂIJ?numberâĂİ, âĂIJ0âĂİ]], [[âĂIJ?nameâĂİ, âĂIJCHICKENâĂİ], [âĂIJ?numberâĂİ, âĂIJ2âĂİ]], [[âĂIJ?nameâĂİ, âĂIJTIGERâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]], [[âĂIJ?nameâĂİ, âĂIJHORSEâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]], [[âĂIJ?nameâĂİ, âĂIJOWLâĂİ], [âĂIJ?numberâĂİ, âĂIJ2âĂİ]], [[âĂIJ?nameâĂİ, âĂIJGOATâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]], [[âĂIJ?nameâĂİ, âĂIJRABBITâĂİ], [âĂIJ?numberâĂİ, âĂIJ4âĂİ]]]

äżżæĎŔãĄőåď´ĽæŢřåŘ■ãĆŠåĹľçŤĺãĄŻãĄŽãĄńæď´IJçť´ćåŕ¿èśąéăĚçŻőãĄń âĂŸ?âĂŹ ãĄőãĄ£ãĆŠæŇĞåőŽãĄŮãĄ§åăť´åŘĹãĂĄåď´ĽæŢřåŘ■ãĄĺãĄŮãĄęãĂĄâĂİ?subjâĂİ, âĂIJ?predâĂİ, âĂIJ?objâĂİ ãĄŇåĞžåŁŻãĄŢãĆŇãĄ¿ãĄŹãĂĆ

éŰćéĂčéăĚçŻő: *addtriple*, *deletetriple*, *uniq*, *RDFãĆţãČĺãČijãČĹ*

6.1.50 sentence

[1.0]

sentenceèęAçt’ăãAŕãĂAęÑśæŰĞãAńår¿ãAŹãĆÑæŢt’å¡ćãĆŠçŻõçŽĎãAĺãAŮãAęãĂAæŰĞçńããAőæIJĂåĹİãAőå■Ÿèłđã ĆŠåd’ğæŰèÑśå■Ůäžěåd’ŰãAńãĂAåd’ğæŰĞå■ŮãČżåřŔæŰĞå■ŮãAŇå■ŸåIJĺãAŹãĆÑãĆõãČłãĆůãČčæŰĞå■Ůç■L’ãAńãĆĆår¿å£IJãAŮãA¿ã

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>Create a sentence with the word *</pattern>
    <template>
        <sentence>HAVE you Heard ABouT <star/></sentence>
    </template>
</category>
```

Input: Create a sentence with the word AnImAl
Output: Have you heard about animal

<sentence />ãAŕ<sentence><star /></sentence>ãAĺåŘŇç¿l’ãAğãAŹãĂĆæŻÿãA■æŔŻãAĹãĆÑãAĺäžěäÿÑãAőægŸãAńãAłãĆŁãA¿ã

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>CORRECT THIS *</pattern>
    <template>
        <sentence />
    </template>
</category>
```

Input: CORRECT THIS PleAse tEll Us The WeAthEr ToDay.
Output: Please tell us the weather today.

6.1.51 size

[1.0]

sizeèęAçt’ăãAŕãĂAåĹl’çŤĺåŘŕèČ¡ãAłãĆńãČĘãĆt’ãČłæŢřãĆŠè£ŤãAŮãA¿ãAŹãĂĆ
ãĆńãČĘãĆt’ãČłæŢřãAńãAŕãĂAåĹİæIJ§çŹżéÑšãAŢãĆÑãA§categoryãAńåŁäãAĹãĂAlearn/learnfãAğçŹżéÑšãAŢãĆÑãA§category

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>çŘĘèğčãAğãA■ãĆÑãĆńãČĘãĆt’ãČłæŢřãAŕïij§</pattern>
    <template>
        <size />ãAğãAŹãĂĆ
    </template>
</category>
```

Input: çŘĘèğčãAğãA■ãĆÑãĆńãČĘãĆt’ãČłæŢřãAŕïij§
Output: 5000ãAğãAŹãĂĆ

6.1.52 space

[custom]

spaceèęAçt’ăăĄŕãĂĄèęAçt’ăæŕÕãĄőçţŘæđIJæŰĞå■ŮåĹŮãĄőéŰŞãĄńå■ŁèğŠãĆźãČŽãČijãĆźãĆŠæŇ£åĚěãĄŮãĄ¿ãĄŹãĂĆ

èŃśæŰĞãĄőăăť’åŘĹãĄńãĄŕå■Ÿèłđé ŰŞãĄńçl’žçŹ¡ãĄŇåĚěãĆŁãĄ¿ãĄŹãĄĄÑãĂĄæŮěæIJńèłđãĄőăăť’åŘĹãĄńãĄŕå§žæIJńçŽĎãĄń
èęAçt’ăăĄğãĄőSubAgen-
téĂčæŘžãĄğåijŢæŢřãĆŠçl’žçŹ¡åŇžåĹĞãĆŁãĄğæŇĞåőŽãĄŹãĆŃåăť’åŘĹãĄłãĄl’ãĄńãĆĆä¡£çŤĺãĄŮãĄ¿ãĄŹãĂĆ

ařŽãĂĄæŰĞå■ŮåĹŮçţŘåŘĹãĄőåĞęçŘĘãĄğéĞ■èd’Ğçl’žçŹ¡ãĄŕijŚãĄd’ãĄőçl’žçŹ¡ãĄńç¡őæŔŻãĄŢãĆŇãĆŃçĆžãĂĄèŃśæŰĞãĄ

```
<category>
    <pattern>ãĄŁãĄŕãĆĹãĄĘãĄŤãĄŰãĄĎãĄ¿ãĄŹãĂĆ</pattern>
    <template>
         <think>
             <set var="french">ãČŢãČňãČşãČĄ</set>
             <set var="italian">ãĆd’ãĆ£ãČłãĆćãČş</set>
             <set var="chinese">äÿ■èŔŕ</set>
         </think>
         <get var="french"/><get var="italian"/><get var="chinese"/>ãĆŠæd’IJçt’ćãĂĆ
         <get var="french"/><space/><get var="italian"/><space/><get var="chinese"/
↪>ãĆŠæd’IJçt’ćãĂĆ
    </template>
</category>
```

Input: ãĄŁãĄŕãĆĹãĄĘãĄŤãĄŰãĄĎãĄ¿ãĄŹãĂĆ
Output: ãČŢãČňãČşãČĄãĆd’ãĆ£ãČłãĆćãČşäÿ■èŔŕãĆŠæd’IJçt’ćãĂĆãČŢãČňãČşãČĄ ãĆd’ãĆ£ãČłãĆćãČş
äÿ■èŔŕãĆŠæd’IJçt’ćãĂĆ

éŰćéĂčéăĚçŻő: *sraix*

6.1.53 split

[2.1]

splitèęAçt’ăăĄŕãČłãĆČãČĄãČąãČĞãĆčãĆćèęAçt’ăăĄğãĂĄXMLåĘĚãĄőæŰĞçńăãĆŠåĹĘåL’šãĄŹãĆŃãĄ§ãĆĄãĄńä¡£çŤĺãĄŮãĄ

år¿èl’śãĆĺãČşãĆÿãČşãĄğãĄŕãĂĄãČłãĆČãČĄãČąãČĞãĆčãĆćèęAçt’ăăĄńår¿ãĄŮãĄęãĂĄXMLå¡ćåijŔãĄőçţŘæđIJãĆŠè£ŤãĄŮãĄ
åő§éŽŻãĄőçŤżéÍćæŔŔçŤżç■L’ãĄŕãĂĄãĆşãČşãČŢãĆčãĆŕãČňãČijãĆůãČğãČşåőŽç¿l’ãĄőclientãĄő *renderer*
ãĄğæŇĞåőŽãĄŮãĄ§åĞęçŘĘãĆŕãČl’ãĆźãĄőåĹűå¿ąãĄńä¿Ìå■ŸãĄŮãĄ¿ãĄŹãĂĆ

```
<category>
    <pattern>ãĄŁãĄŕãĆĹãĄĘãĄŤãĄŰãĄĎãĄ¿ãĄŹãĂĆ</pattern>
    <template>
         äżŁæŮěãĄŕãĄĎãĄĎåd’l’ærŮãĄğãĄŹãĄ■ãĂĆ
         <split/>
         æŸŐæŮěãĆĆæŹt’ãĆŇãĆŃãĄĺãĄĎãĄĎãĄğãĄŹãĄ■ãĂĆ
    </template>
</category>
```

Input: ãĄŁãĄŕãĆĹãĄĘãĄŤãĄŰãĄĎãĄ¿ãĄŹãĂĆ
Output:
äżŁæŮěãĄŕãĄĎãĄĎåd’l’ærŮãĄğãĄŹãĄ■ãĂĆ<split/>æŸŐæŮěãĆĆæŹt’ãĆŇãĆŃãĄĺãĄĎãĄĎãĄğãĄŹãĄ■ãĂĆ

6.1.54 sr

[1.0]

srèęAçť ăãAŕãĂAåĚěåŁŻæŰĞãAńår¿ãAŹãĆŃsraièęAçť ăåĞęçŘĘãĆŠçřąæŸŞãAńèąÑãĄĘãĆĆãAőãĄğãĂA<srai><star/></srai> ãAőçIJAçŢěå¡cãAğãAŹãĂĆ
å¿ŞãAčãAęãĂA*srai* èęAçť ăãAÍåŘŇægŸãAńãĂAąãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşåőŽç¿l'ãAő *åĹűéŹŘåĂd'åőŽç¿l'* ãAő `max_search_srai` ãAőåĹűéŹŘår¿èśąãAğãAŹãĂĆ

- ä¡£çŤÍä¿Ń

```
<category>
    <pattern>çğĄãĄőèşłåŢŕãĄŕ * ãĄğãĄŹ</pattern>
    <template>
        <sr />
    </template>
</category>
```

<sr />ãAŕãĂA<srai><star/></srai>ãAÍåŘŇç¿l'ãAğãAŹãĂĆ

```
<category>
    <pattern>çğĄãĄőèşłåŢŕãĄŕ * ãĄğãĄŹ</pattern>
    <template>
        <srai><star/></srai>
    </template>
</category>
```

éŰćéĂčéăĚçŻő: *star*, *srai*

6.1.55 srai

[1.0]

sraièęAçť ăãAŕãĂAåĘĚåőźãAğæŃñãĆL'ãĆŇãA§æŰĞçńăãAğãČŚãĆ£ãČijãČşãČđãČČãČĄãĆŠåő§èąŇãAŮãĂAèl'šå¡ŞãAŹãĆŃcat
âĂIJsraiâĂİèĞłä¡ŞãAńãAŕæ■čåijŔãAłæĎŔåŚşãĆŠæŇĄãĄąãA¿ãAŻãĆŞãAŇãĂAsymbolic reductionãĂĄãĆĆãAŮãAŔãAŕãĂAsymbolic recursionãAĺãAĎãAĘæĎŔåŚşãAńãAłãĆŁãA¿ãAŹãĂĆ

åĚśéĂŽçŽĎãAłåĞęçŘĘãĆŠèąŇãAĘcategoryãĆŠçŹžéŇšãAŮãAęãAŁãA■ãĂAsraièęAçť ăãAńår¿å£IJãAŹãĆŃçŹžèl'śæŰĞãĆŠæŇ

sraiåĞęçŘĘãAŕãČŚãĆ£ãČijãČşãČđãČČãČĄãĆŠèd'ĞæŢřåŻđèąŇãAĘãA§ãĆAèšäè■ůãAŇéńŸãAŔãĂAåő§æŰ¡åŻđæŢřãĆŠãĆşãČş *åĹűéŹŘåĂd'åőŽç¿l'* ãAő `max_search_srai` ãAğåĹűéŹŘãAŮãAęãAĎãA¿ãAŹãĂĆ

åĹűéŹŘåŻđæŢřãĆŠèűĚãAĹãAęsraiåĞęçŘĘãĆŠèąŇãAčãA§åät'åŘĹãĂAåĞęçŘĘä¿Ńåd'ŰãAŇçŹžçŤ§ãAŮãA¿ãAŹãĂĆ

äžëäÿŇãAőä¿ŃãAŕãĂAâĂİHIâĂİãAńår¿å£IJãAŮãA§categoryãAğåĚśéĂŽãAŹãĆŃåĞęçŘĘãĆŠåőŽç¿l'ãAŮãĂAąãAİãAőäżŰãAőåĚ

- ä¡£çŤÍä¿Ń

```
<category>
    <pattern>ãAŞãĆŞãAńãAąãAŕ</pattern>
    <template><srai>HI</srai></template>
</category>
```

(continues on next page)

(continued from previous page)

```
<category>
    <pattern>Hello</pattern>
    <template><srai>HI</srai></template>
</category>

<category>
    <pattern>Hola</pattern>
    <template><srai>HI</srai></template>
</category>

<category>
    <pattern>HI</pattern>
    <template>ãĄŞãĆŞãĄńãĄąãĄŕ</template>
</category>
```

Input: Hola
Output: ãĄŞãĆŞãĄńãĄąãĄŕ

éŰćéĂčéăĚçŻő: *star*, *sr*

6.1.56 sraix

[2.0]

sraixèęAçţ’ăãAŗãĂAsraiãAőæŃąåijţæľ’§èČ¡ãAğãAŗãAłãAŔãĂAãĆţãČŰãĆÍãČijãĆÿãĆğãČşãČĹéĂčæŘžãĆŠèąÑãAĘåĹěãAőæľ’§è

åd’ŰéČÍãAÍãAőéĂŽä£ąãĆŠèąÑãAĘãA§ãĆAąĂAçŻÿæL’ŃãĆţãČijãČŞãĆźãAÍãAőéĂŽä£ąåĘĚåőźãAőçćžèł■ãĆŠèąÑãAčãA§äÿŁãA

åŔĹãĂAéĂŽä£ąçŢřåÿÿãAÑçŹžçŤ§ãAŮãA§åät’åŘĹãAőèĂČæĚőãĆĆå£ĚèęAąAğãĂAçŢřåÿÿæŹĆãAőæŰĞå■ŮåĹŮãAőæŇĞåőŽã

éĂŽä£ąæŹĆéŰŞãAńãAd’ãAĐãAęãĆĆãĂAąĆ£ãĆd’ãČăãĆćãĆęãČĹæŹĆéŰŞãAőæŇĞåőŽãAÍãAÍãĆĆãAńãĂAéĂAåŔŮä£ąãAőæŹ

ãĆţãČŰãĆÍãČijãĆÿãĆğãČşãČĹãAŇæŔŘä¿ŻãAŹãĆŃãĆţãČijãČŞãĆźãAÍéĂčæŘžãAŹãĆŃæŰźæşŢãAńãAŗãĂAäżěäÿŃãAőïijŤçÍőé

- *æśŐçŤÍŔESTãĆd’ãČşãĆ£ãČŢãĆğãČijãĆź*
- *åŕ¿èľśãČŮãČľãĆČãČĹãČŢãĆľãČijãČăăAğãĂAåĚňéŰŃãAŢãĆŃãAęãADãĆNbotåŚijãAşåĞžãAŲ*
- *NLUéĂŽä£ąãĆd’ãČşãĆ£ãČŢãĆğãČijãĆź*
- *ãĆńãĆźãĆ£ãČăåd’ŰéČÍãĆţãČijãČŞãĆźåő§èčĚ*

sraixèęAçţ’ăãAğæŇĞåőŽãAŹãĆŃåśđæĂğãČżå■ŘèęAçţ’ăãAŗäżěäÿŃãAńãAłãĆŁãA¿ãAŹãĂĆèľşçţ’řãAŕ *Sub-Agent* ãĆŠåŔĆçĚğãAŮãAęãAŘãAąăAŢãADãĂĆ

- åśđæĂğ

ãČŠãČŕãČąãČŕãČąãĆŠãČĘéáĺňæŸŐ			
service	string	No	ãĆńãĆźãĆ£ãČäåď ŰéČĺãĆţãČijãČŞãĆźãĄőãĆţãČijãČŞãĆźåŘ■ãĂĆ
botName	string	No	botãĆţãČijãČŞãĆźéĂčæŘžãĄőbotãĆĺãĆď ãČłãĆćãĆźåŘ■ãĂĆ
nlu	string	No	NLUãĆţãČijãČŞãĆźéĂčæŘžãĄőNLUãĆĺãĆď ãČłãĆćãĆźåŘ■ãĂĆ
template	string	No	æśŐçŤÍRESTãĆţãČijãČŞãĆźéĂčæŘžçŤÍãĄőéŻŻå¡ćåŘ■ãĂĆ
default	string	No	éĂŽä£ąçŢřåÿÿçŹžçŤ§æŹĆãĄőçţŘæđIJæŰĞå■ŮåĹŮãĂĆ
timeout	string	No	éĂŽä£ąãĆ£ãĆď ãČäãĆćãĆęãČĽæŹĆéŰŞïijĽçğŠå■Ÿä¡■ïijĽãĆŠ âĂŸ1âĂŹ äžĕäÿŁãĄőæŢť æŢřãĄğæŇĞåőŽãĂĆæIJłæŇĞåőŽæŹĆãĄŕ âĂŸ10âĂŹãĂĆ

- å■ŘèęĄçť ä

ãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹãĄőéĂčæŘžæŰźæşŢãĄńãĆĹãĄčãĄęæŇĞåőŽãĄŹãĆŃå■ŘèęĄçť ääĄŇçŢřãĄłãĆŁãĄ¿ãĄŹãĂĆ*Su*
ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄäãĄŢãĄĎãĂĆ

åřŽãĂĄå■ŘèęĄçť ääĄőåĘĚåőźãĄńäÿ■æ■čãĄÑãĄĆãĄčãĄ§åăť åŘĹãĂĄåĞęçŘĘä¿Ńåď ŰãĄÑçŹžçŤ§ãĄŹãĆÑãĄŞãĄĺãĄÑãĄĆãĆ

äżĕäÿŃãĄŕãĂĄãĆńãĆźãĆ£ãČäåď ŰéČĺãĆţãČijãČŞãĆźãĆŠåĹľçŤĺãĄŮãĄ§ä¿ŃãĄğãĄŹãĂĆ

åřŽãĂĄæŮĕæIJňèłđãĄőåăť åŘĹãĂĄsraixèęĄçť ääĄőåĘĚåőźãĄŇåĚĺãĄęçţŘåŘĹãĄŢãĆŇãĄęçľžçŹ¡åŇžåĹĞãĆŁãĄńãĄłãĆĽãĄłå
space ãĆŠæŇĞåőŽãĄŮãĄęãĄĎãĄ¿ãĄŹãĂĆ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>*ãĄŃãĆĽ*ãĄ¿ãĄğãĄőäźŮãĆŁæŔŻãĄĹæąĹåĘĚ</pattern>
    <template>
        <sraix service="myService">
            <star/>
            <space />
            <star index="2"/>
        </sraix>
    </template>
</category>
```

Input: æĺśäžňãĄŃãĆĽåď ğéŸłãĄ¿ãĄğãĄőäźŮãĆŁæŔŻãĄĹæąĹåĘĚ
Output: 10:00çŹžãĄőãĂĄãĄőãĄđãĄ£ãĄÑäÿĂçŢłæŮľãĄŔçİĂãĄ■ãĄ¿ãĄŹãĂĆ

éŰćéĂčéăĚçŻő: *star*, *space*, *SubAgent*

6.1.57 star

[1.0]

starèęĄçť ääĄŕãĂĄåĚĕåŁŻæŰĞãĄńåŕ¿ãĄŮãĄęãĂĄpatternèęĄçť äïijĽãČŕãĆď ãČńãČĽãĆńãČijãČĽãĆŠåŘńãĆĂïijĽãĄńèľšå¡ŞãĄ
ãČŕãĆď ãČńãČĽãĆńãČijãČĽãĄĺãĄŕãĂĄ1ãĄď äżĕäÿŁãĄőæŰĞå■ŮåĹŮãĆŠæŇĞåőŽãĄŹãĆŃ *,
_ãĂĄãĆĆãĄŮãĄŔãĄŕãĂĄ0äżĕäÿŁãĄőæŰĞå■ŮåĹŮãĆŠæŇĞåőŽãĄŹãĆŃ ^, #
ãĄńèľšå¡ŞãĄŹãĆŃæŰĞå■ŮåĹŮãĆŠæĎŔåŚşãĄŮãĂĄpatternèęĄçť ääĄő `set`ãĂĄ`iset`ãĂĄ`regex`ãĂĄ`bot`
èęĄçť ääĄńèľšå¡ŞãĄŹãĆŃæŰĞå■ŮåĹŮãĆĆåŕ¿èśąãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

æŰĞå■ŮåĹŮåŔŰå¿ŮãĄńãĄŕè■ŸåĹěçŢłåŔůãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĄŇãĂĄè■ŸåĹěçŢłåŔůãĄńår¿å£IJãĄŮãĄ§æŰĞå■ŮåĹŮã

starèęAçt'ăãĄğåŔŰå¿ŮãĄŹãĆŃçţŘæđIJãĄŕãČŚãĆ£ãČijãČşãČđãČČãČĄãČşãĆřæŹĆãĄőåĂd'ãĄŇår¿èśąãĄĺãĄłãĆŃãĄ§ãĆĄãĂĄ

- ãČŕãĆd'ãČńãČL'ãĆńãČijãČL'ãĄőçţŘæđIJïijŽ èŃśæŢřèĺŸåŔůïijŽå■ŁèğŠãĂĄãĆńãĆ£ãĆńãČŁïijŽåĚĺèğŠãĄńåd'L'æŔŻãĄŢãĆ
- setèęAçt'ăãĄőçţŘæđIJïijŽ ãČđãČČãČĄãĄŮãĄ§ *å■Ÿèłđ ãČłãĆźãČĹïijĹsetsïijL'ãČŢãĆąãĆd'ãČń* ãĄőåőŽç¿l'æŰĞå■ŮåĹŮãĂĆ
- isetèęAçt'ăãĄőçţŘæđIJïijŽ ãČđãČČãČĄãĄŮãĄ§ *isetãĄő* ãĄőwordsåőŽç¿l'æŰĞå■ŮåĹŮãĂĆ
- regexèęAçt'ăãĄőçţŘæđIJïijŽ æ■čèęŔèąĺçŔ¿ãĄĺãĄŮãĄęãČđãČČãČĄãĄŮãĄ§ãĂĄèŃśæŢřèĺŸåŔůïijŽå■ŁèğŠãĂĄãĆńãĆ£ãĆ
- botèęAçt'ăãĄőçţŘæđIJïijŽ ãČđãČČãČĄãĄŮãĄ§ *propertiesãČŢãĆąãĆd'ãČń* ãĄőåőŽç¿l'æŰĞå■ŮåĹŮãĂĆ
- åśđæĂğ

ãČŚãČľãĆãĄźãĆŽãĄĆãĄŮãĄ£ĚéãĹńæŸŐ			
index	string	No	starè■ŸåĹěçŢłåŔůãĆŠ âĂŸ1âĂŹ äžěäÿŁãĄőæŢť'æŢřãĄğæŇĞåőŽãĂĆæIJłæŇĞåőŽæŹĆãĄŕ âĂŸ1âĂŹãĂĆ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>çğĄãĄŕ * ãĄĺ * ãĄŇåě¡ãĄ■ãĄğãĄźãĂĆ</pattern>
    <template>
        ãĄĆãĄłãĄ§ãĄŕãĂĄ <star /> ãĄĺ <star index="2" /> ãĄŇåě¡ãĄ■ãĄłãĄőãĄğãĄźãĄ■ãĂĆ
    </template>
</category>
```

Input: çğĄãĄŕèŁśãĄĺçŇńãĄŇåě¡ãĄ■ãĄğãĄźãĂĆ
Output: ãĄĆãĄłãĄ§ãĄŕãĂĄèŁśãĄĺçŇńãĄŇåě¡ãĄ■ãĄłãĄőãĄğãĄźãĄ■ãĂĆ

éŰćéĂčéăĚçŻő: *sr*, *srai*

6.1.58 system

[1.0]

systemèęAçt'ăãĆŠä¡£çŤĺãĄźãĆŃãĄĺãĂĄãĆůãĆźãČĘãČäãĆşãČijãČńãĆŠåĹl'çŤĺãĄźãĆŃãĄşãĄĺãĄŇãĄğãĄ■ãĄ¿ãĄźãĂĆ

ãČęãČijãĆűãĄŇãĆłãČŽãČńãČijãČĘãĆčãČşãĆřãĆůãĆźãČĘãČäãĆŠç§ěãĄčãĄęãĄĐãĄęãĆůãĆğãČńãĆźãĆřãČłãČŮãČĹãĆŠæşĺåĚ
åĹl'çŤĺãĄŇå£ĚèęĄãĄłåät'åŘĹãĄŕãĂĄãĆşãČşãČŢãĆčãĆřãČńãČijãĆůãČğãČşãĄő *overridesåőŽç¿l'* ãĄğãĂĄallow_system_aiml ãĄń âĂŸtrueâĂŹ ãĆŠèĺ■åőŽãĄŹãĆŃå£ĚèęĄãĄŇãĄĆãĆŁãĄ¿ãĄŹãĂĆ

systemèęAçt'ăãĄőçţŘæđIJãĄŕãĆůãĆźãČĘãČąŠřáćČãĄńä¿Ìå■ŸãĄŮãĄ¿ãĄŹãĄŇãĂĄãĆůãĆźãČĘãČäãĆşãČijãČńãĄŇåĹl'çŤĺãĄğ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>LIST ALL AIML FILES</pattern>
    <template>
```

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```
        <system>ls -l *.aiml</system>
    </template>
</category>
```

6.1.59 that

[1.0]

thatèęAçť'ăăAfăĂAcategory
ăAőå■ŘèęAçť'ăăAÍăAŮăAęăĆĆåőŽç¿l'ăAŇăAĆăĆŁăĂAçŻť'åL'■ăAőå£IJç■ŤæŰĞăAÍăAőäÿĂèĞť'åĹd'åőŽăAńåĹl'çŤÍăAŢăĆŇăA
that ăAfăĂAéAŐåŐżăAőå£IJç■ŤæŰĞăĆŠåŘŰå¿ŮăAŹăĆŃèęAçť'ăăAÍăAŮăAęä¡£çŤÍăAŮăA¿ăAŹăĂĆ

åśěæ■t'ăAőæŇĞåőŽăAńăAfåśěæ■t'çŢłåŘůăĆŠä¡£çŤÍăAŮăĂAâĂŸ0âĂŹăAŇçŘ¿åIJÍïijĹæIJłçćžåőŽăAőçĆžăĂAæŇĞåőŽäÿ■åŘŕïi
1âĂŹăĆŠæŇĞåőŽăAŹăĆŃăAÍæIJĂåŘd'ăAőå£IJç■ŤæŰĞăAŇåŘŰå¿ŮăAğăA■ăA¿ăAŹăĂĆ

èl'šå¡ŞăAŹăĆŃåśěæ■t'ăAŇăAłăAĎåśěæ■t'çŢłåŘůăĆŠæŇĞåőŽăAŮăA§åăt'åŘĹăĂAåŘŰå¿Ůåd'śæŢŮăAÍăAŮăAęçl'žæŰĞå■ŮăĆ

- åśđæĂğ

ãČŚãČľáČãąĆĆąáĆĆąáĆĆąåĆĚéěĺňæŸŐ			
index	string	No	åśěæ■t'çŢłåŘůăĆŠ âĂŸ0âĂŹ äžěåd'ŰăAőæŢt'æŢřåĂd'ăAğæŇĞåőŽăĂĆæIJłæŇĞåőŽæŹĆăAf âĂŸ1âĂŹăĂĆ

- ä¡£çŤÍä¿Ń

```
<category>
    <pattern>ãAŞăĆŞăAńăAąăĆŔ</pattern>
    <template>
         ãAŞăĆŞăAńăAąăAf
    </template>
</category>

<category>
    <pattern>ãAŹăA£ãA¿ãAŻăĆŞ</pattern>
    <template>
         <that />ãAğăAŹăA■
    </template>
</category>
```

Input: ãAŞăĆŞăAńăAąăĆŔ
Output: ãAŞăĆŞăAńăAąăAf
Input: ãAŹăA£ãA¿ãAŻăĆŞ
Output: ãAŞăĆŞăAńăAąăAfăAğăAŹăA■

éŰćéĂčéăĚçŻő: *that(pattern)*, *thatstar*

6.1.60 thatstar

[1.0]

thatstarèęAçt’ăãAąŕãĂĄthat
ãAągæŇĞåőŽãAŲãA§ãČŕãĆd’ãČńãČL’ãĆńãČijãČL’ãAńår¿å£IJãAŹãĆŃæŰĞå■ŮåĹŮãĆŠåŔŰå¿ŮãAŲãA¿ãAŹãĂĆ
patternãAńår¿ãAŹãĆŃ *star*
ãAĺåŘŇãAŸæŰźæşŢãAągãĆćãĆŕãĆżãĆźãAŢãĆŇãA¿ãAŹãAąŇãĂĄpatternãAąõãČŕãĆd’ãČńãČL’ãĆńãČijãČL’ãAągãAŕãAłąŔãĂĄth

æŰĞå■ŮåĹŮåŔŰå¿ŮãAńãAŕè■ŸåĹěçŢłåŔůãĆŠæŇĞåőŽãAŲãA¿ãAŹãAąŇãĂĄè■ŸåĹěçŢłåŔůãAńår¿å£IJãAŲãA§æŰĞå■ŮåĹŮã

- åśđæĂğ

| ãČŚãČľãĆąąĆąĆąĆ

6.1.62 topicstar

[1.0]

topicstarèęAçţ'ăãĄŕãĂĄtopic
ãĄğæŇĞåőŽãĄŮãĄ§ãČŕãĆď'ãČńãČL'ãĆńãČijãČL'ãĄńåŕ¿å£IJãĄŹãĆŃæŰĞå■ŮåĹŮãĆŠåŔŰå¿ŮãĄŮãĄ¿ãĄŹãĂĆ
patternãĄńåŕ¿ãĄŹãĆŃ *star*
ãĄĺåŘŇãĄŸæŰźæşŢãĄğãĆćãĆŕãĆżãĆźãĄŢãĆŇãĄ¿ãĄŹãĄŇãĂĄpatternãĄőãČŕãĆď'ãČńãČL'ãĆńãČijãČL'ãĄğãĄŕãĄłãĄŔãĂĄto

æŰĞå■ŮåĹŮåŔŰå¿ŮãĄńãĄŕè■ŸåĹěçŢłåŔůãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĄŇãĂĄè■ŸåĹěçŢłåŔůãĄńåŕ¿å£IJãĄŮãĄ§æŰĞå■ŮåĹŮã

- åśđæĂğ

| ãČŚãČľãĆãĆčãĆźãĆŕãĆżãĆźãĆŕãĆżãĆźãĆŕãĆż

uniqèęAçt’ăăĄgăĄőæd’IJçt’ćăĄgăĄŕăĂĄåŔŰå¿ŮăĄŮăĄ§ăĄĎéăĚçŻőăĄńår¿ăĄŮăĄę âĂŸ?âĂŹ
ăĆŠæŇĞåőŽăĄŮăĄ¿ăĄŹăĂĆ
æd’IJçt’ćçţŘædIJăĄÑăĄłăĄŃăĄčă§åăt’åŘĹăĄńăĄŕăĂĄăĆşăČşăČŢăĆčăĆřăČńăCijăĆůăČğăČşåőŽç¿l’ăĄő
default-get ăĄőåĂd’ăĄŇè£ŤăĆŁăĄ¿ăĄŹăĂĆ

- å■ŘèęAçt’ă

| ãČŚăČl’ăCăăă

(continued from previous page)

```
    </template>
</category>
```

Input: æąIJ ãĄŕ ãČŘãČľçğŚ
Output: çŹżéŇšãĄŮãĄ¿ãĄŮãĄ§
Input: èŃž ãĄŕ ãČŘãČľçğŚ
Output: çŹżéŇšãĄŮãĄ¿ãĄŮãĄ§
Input: æŐćãĄŮãĄę æąIJ ãĄŕ ?
Output: ãČŘãČľçğŚ
Input: æŐćãĄŮãĄę ? ãĄŕ ãČŘãČľçğŚ
Output: æąIJ èŃž

éŰćéĂčéăĚçŻő: *addtriple*, *deletetriple*, *select*, *RDFãĆţãČİãČijãČĹ*

6.1.64 uppercase

[1.0]

uppercaseèęAçţ'ăãĄŕãĂĄåŕ¿èśąãĄĺãĄłãĆŃæŰĞå■ŮåĹŮåĘĚãĄőå■ŁèğŠèŃśå■ŮãĆŠåď'ğæŰĞå■ŮãĄńãĄŮãĄ¿ãĄŹãĂĆèŃśå■Ůäż

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ * ãĄğãĄŹ</pattern>
    <template>
        ãĄŞãĆŞãĄńãĄąãĄŕ<uppercase><star /></uppercase>ãĄŢãĆŞ
    </template>
</category>
```

<uppercase />ãĄŕãĂĄ<uppercase><star /></uppercase>ãĄĺåŘŇç¿ľ'ãĄğãĄŹãĂĆæŻÿãĄ■æŔŻãĄĹãĆŃãĄĺäżěäÿŃãĄőæğŸãĄńãĄł

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ * ãĄŢãĆŞ</pattern>
    <template>
        ãĄŞãĆŞãĄńãĄąãĄŕ<uppercase />ãĄŢãĆŞ
    </template>
</category>
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕ george washington ãĄŢãĆŞ
Output: ãĄŞãĆŞãĄńãĄąãĄŕGEORGE WASHINGTONãĄŢãĆŞ

éŰćéĂčéăĚçŻő: *lowercase*

6.1.65 vocabulary

[1.0]

vocabularyèęAçţ'ăãĄŕãĂĄBotãĄőå■ŸèłđæŢřãĄĺãĄŮãĄęèţůåŃŢæŹĆãĄńåśŢéŰŃãĄŢãĆŇãĄ§äżěäÿŃãĄőéăĚçŻőãĄőåŘĹèĺĺÆŢř

- *patternèęAçţ'ă* ãĄğèĺŸè£řãĄŢãĆŇãĄ§å■ŸèłđãĄőçůŔæŢřïijĹãČŕãĆď'ãĆńãČL'ãĆńãČijãČL'ãĆĎãĂĄisetç■L'ãĄőå■ŘèęAçţ'ăã

- åĚÍãĄęãĄő *å■Ÿèłđ̃ãČłãĆźãČĹïijĹsetsïijĽãČŢãĆąãĆd'ãČń* ãĄńèÍŸèijĽãĄŢãĆŇãĄ§ãČłãĆźãČĹæŢřãĄőåŘĹèÍĹåĂd'ãĂĆ

æŮěæIJňèłđãĄőåät'åŘĹãĂĄå■Ÿèłđå[ĘåL'šãĄŮãĄ§äÿŁãĄğçl'■çőŮãĄŮãĄ¿ãĄŹãĂĆ
å■ŸèłđãĄőéĞ■èd'ĞãĄŕçš¿æ§żãĄŮãĄęãĄĎãĄłãĄĎãĄ§ãĆĄãĂĄçt'ŕèÍĹåĂd'ãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

- ä¡£çŤÍä¿Ń

```
<category>
    <pattern>ç§ěãĄčãĄęãĄĎãĆŃå■Ÿèłđæ̃řãĄŕïij§</pattern>
    <template>
        <vocabulary />ãĄğãĄŹãĂĆ
    </template>
</category>
```

Input: ç§ěãĄčãĄęãĄĎãĆŃå■Ÿèłđæ̃řãĄŕïij§
Output: 10000ãĄğãĄŹãĂĆ

éŰćéĂčéăĚçŻő: *size*

6.1.66 video

[2.1]

videoèęĄçt'ăãĄŕãĂĄãČłãČČãČĄãČąãČĞãĆčãĆćèęĄçt'ăãĄğãĂĄãČŞãČĞãĆłãĄőæČĚåăśãĆŠè£ŤãĄŹãĄŞãĄĺãĄÑãĄğãĄ■ãĄ¿ãĄ
ãČŞãČĞãĆłãĄőURLãĆĎãČŢãĆąãĆd'ãČńåŘ■ãĆŠæŇĞåőŽãĄŹãĆŃãĄŞãĄĺãĄÑãĄğãĄ■ãĄ¿ãĄŹãĂĆ

åŕ¿èl'śãĆĺãČşãĆÿãČşãĄğãĄŕãĂĄãČłãČČãČĄãČąãČĞãĆčãĆćèęĄçt'ăãĄńåŕ¿ãĄŮãĄęãĂĄXMLå¡ćåijŔãĄőçţŘæđIJãĆŠè£ŤãĄŮãĄ
åő§éŽŻãĄőçŤżéÍćæŔŔçŤżç■L'ãĄŕãĂĄãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşåőŽç¿l'ãĄőclientãĄő *renderer*
ãĄğæŇĞåőŽãĄŮãĄ§åĞęçŘĘãĆŕãČl'ãĆźãĄőåĹűå¿ąãĄńä¿İå■ŸãĄŮãĄ¿ãĄŹãĂĆ

- ä¡£çŤÍä¿Ń

```
<category>
    <pattern>ãČŞãČĞãĆłèąÍçd'ž</pattern>
    <template>
        <video>https://url.for.video</video>
    </template>
</category>
```

6.1.67 word

[1.0]

wordèęĄçt'ăãĄŕåĘĚéČÍåĞęçŘĘãĄğçŤ§æĹŘãĄŹãĆŃèęĄçt'ăãĄğãĂĄtemplateåĘĚãĄńèÍŸè£ŕãĄŢãĆŇãĄęãĄĎãĆŃãČĘãĆ■ãĆźãČ

- ä¡£çŤÍä¿Ń

```
<category>
    <pattern>HELLO</pattern>
    <template>Hi there!</template>
</category>
```

ãĄŞãĄőä¡£çŤÍä¿ŃãĄőåät'åŘĹãĂĄâĂŹHi there!âĂŹ ãĄŇwordèęĄçt'ăãĄÍãĄŮãĄęåśŢéŰŃãĄŢãĆŇãĄ¿ãĄŹãĂĆ

6.1.68 xml

[1.0]

xmlãĄĺãĄĎãĄĘèęĄçť˘ăăĄŕå■ŸåIJĺãĄŮãĄ¿ãĄŻãĆŞãĄŇãĂĄåŕ¿èľ´śãĆĺãČşãĆÿãČşãĄğä¡£çŤĺåŔŕèČ¡ãĄłèęĄçť˘ăäžěåď˙ŰãĄŇXML
ãĄŞãĆŇãĄńãĆĹãĆŁãĂĄtemplateãĄőå£IJç■ŤãĄőäÿĂéČĺãĄĺãĄŮãĄęãĂĄXMLå¡ćåijŔãĄőèęĄçť˘ăăĆŠèĺŸèijL˘ãĄŹãĆŇãĄŞãĄĺãĄ

- ä¡£çŤĺä¿Ń

```
<category>
    <pattern> * ãĆŠãČIJãČijãČńãČL'èąĺçd'ž</pattern>
    <template>
        <bold><star /></bold>
    </template>
</category>
```

Input: åŕ¿èśąçŕĎåŻšãĆŠãĆŠãČIJãČijãČńãČL'èąĺçd'ž
Output: <bold>åŕ¿èśąçŕĎåŻš</bold>ãĂĆ

CHAPTER 7

ãČŚãĆ£ãČijãČşãČđãČČãČĄãČşãĆř

åĚěåŁŻæŰĞãĄÍpatternèęĄçţ’ãăĄÍãĄőãČđãČČãČĄãČşãĆřãĄŕãĂĄãĄÍãĆŇãĄđãĆŇãĄńåŕ¿ãĄŮãĄęãĆşãČijãČL’åd’L’æŔŻãĆŠèąŇ
ãČđãČČãČĄãČşãĆřãĄğä¡£çŤÍãĄŹãĆŃæŰĞå■ŮãĄŕãĂĄèŃśæŢřèÍŸåŘůãĄŕå■ŁèğŠæŰĞå■ŮãĂĄãĆńãĆ£ãĆńãČŁãĄŕåĚÍèğŠæŰĞ

åĚěåŁŻæŰĞãĄńåŕ¿ãĄŮãĄęãĄŕãĂĄãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşåőŽç¿l’ãĄńãĆĹãĆŁãČđãČČãČĄãČşãĆřãĄğä¡£çŤÍãĄ
ãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşåőŽç¿l’ãĄŕãĂĄ*tokenizeråőŽç¿l’* ãĄőpunctua-
tion_charsãĄğæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ

AIMLãĄőãČŚãĆ£ãČijãČşãČđãČČãČĄãČşãĆřãĄğãĄŕãĂĄãČęãČijãĆűåĚěåŁŻãĄńåŕ¿ãĄŮãĄęãĆřãĆd’ãČńãČL’ãĆńãČijãČL’ãĆŚåĹ
ãČřãĆd’ãČńãČL’ãĆńãČijãČL’ãĄőæŇĞåőŽãĄńãĄŕ ⋆, ^ , _, # ãĄŇãĄĆãĆŁãĂĄåŘĐãĂĚåĹl’çŤÍæŰźæşŢãĄŇçŢřãĄłãĆŁãĄ¿ãĄŹã

ãĄ§ãĄăãĄŮãĂĄãĆřãĆd’ãČńãČL’ãĆńãČijãČL’ãĆŚéĂčçűŽãĄŮãĄęèÍŸè£řãĄŮãĄ§patternèęĄçţ’ãăĆŠæŇĞåőŽãĄŹãĆŃåăţ’åŘĹãĄ
ãĄÍ *zerooremore* ãĄőæůůåŘĹãĄŕéĄ£ãĄŚãĄęãĄŘãĄăãĄŢãĄĐãĂĆèłď’åŃŢä¡IJãĄŇçŹžçŤ§ãĄŹãĆŃåăţ’åŘĹãĄŇãĄĆãĆŁãĄ¿ãĄŹã

7.1 ⋆ ãČřãĆd’ãČńãČL’ãĆńãČijãČL’

⋆ ãĆŚçŤÍãĄĐãĆŃãĄŞãĄÍãĄğãĂĄãČęãČijãĆűåĚěåŁŻãĄőå■ŸèłđãĆŠæŁ¡åĞžãĄŹãĆŃãĄŞãĄÍãĄŇãĄğãĄ■ãĂĄ1ãĄď’äżěäÿŁãĄő

```
<pattern>ãĄŞãĆŞãĄńãĄąãĄŕ ⋆</pattern>
```

ãĄŞãĄőä¿ŃãĄğãĄŕãĂĄ

```
ãĄŞãĆŞãĄńãĄąãĄŕïijĄ
ãĄŞãĆŞãĄńãĄąãĄŕåśśçŤřãĄŢãĆŞ
ãĄŞãĆŞãĄńãĄąãĄŕèłřãĄğãĄŹãĄŇïijş
```

ãĄńãČđãČČãČĄãĄŮãĄ¿ãĄŹãĂĆ ãĄŮãĄŇãĄŮãĂĄãĄŞãĄőä¿ŃãĄğãĄŕâĂİãĄŞãĆŞãĄńãĄąãĄŕâĂİãĄńçűŽãĄŘå■ŸèłđãĆŠæIJ§ã

7.2 ^ ãČřãĆd’ãČńãČL’ãĆńãČijãČL’

^ ãĆŚçŤÍãĄĐãĆŃãĄŞãĄÍãĄğãĂĄ0äżěäÿŁãĄőå■ŸèłđãĆđãČČãČĄãČşãĆřãĆŠæŇĞåőŽãĄğãĄ■ãĄ¿ãĄŹãĂĆïijĹzeroormoreãĆřãĆ
ãĄŹãĄłãĆŘãĄąãĂĄãĆřãĆd’ãČńãČL’ãĆńãČijãČL’ãĄńçŻÿå¡ŞãĄŹãĆŃå■ŸèłđãĄŇçĐąãĄŘãĄęãĆĆãĂĄæŇĞåőŽãĄŮãĄ§å■Ÿèłđã

```
<pattern>ãĄŞãĆŞãĄńãĄąãĄŕ ^</pattern>
```

ãĄŞãĄőä¿ŃãĄğãĄŕãĂĄ⋆ ãĄÍçŢřãĄłãĆŁãĂĄ

```
ãĄŞãĆŞãĄńãĄąãĄŕ
ãĄŞãĆŞãĄńãĄąãĄŕïijĄ
ãĄŞãĆŞãĄńãĄąãĄŕåśśçŢřãĄŢãĆŞ
ãĄŞãĆŞãĄńãĄąãĄŕèłřãĄğãĄŹãĄŃïijş
```

ãĄÍãĂĄâĂİãĄŞãĆŞãĄńãĄąãĄŕâĂİå■Ÿä¡ŞåĚëåŁŻãĄńãĆĆãČđãČČãČĄãĄŮãĄ¿ãĄŹãĂĆ

7.3 _ ãĄÍ # ãČŕãĆď'ãČńãČL'ãĆńãČijãČL'

⋆ ãĄÍ ^ ãĄŕãĂĄå■ŸèłđãĄőãČđãČČãČĄãČşãĆŕãĆĹãĆŁåĎłåĚĹéãĘä¡■ãĄŇä¡ÕãĄĎèl'Ţä¿ąãĆŠèąŇãĄĎãĄ¿ãĄŹãĂĆ ãĄŹãĄłãĆŔãĄąãĂĄ

```
<pattern>ãĄŞãĆŞãĄńãĄąãĄŕ ãĄĎãĄĎåd'l'ærŮãĄğãĄŹãĄ■</pattern>
<pattern>ãĄŞãĆŞãĄńãĄąãĄŕ ^</pattern>
<pattern>ãĄŞãĆŞãĄńãĄąãĄŕ ⋆</pattern>
```

ãĄÍãĄĎãĄĘåőŽç¿l'ãĄŇãĄŢãĆŇãĄęãĄĎãĄ§åät'åŘĹãĂĄâĂİãĄŞãĆŞãĄńãĄąãĄŕ ãĄĎãĄĎåd'l'ærŮãĄğãĄŹãĄ■âĂİãĄÍãĄĎãĄĘåĚëåŁŻãĄőåät'åŘĹäÿĂçŢłäÿŁãĄő-patternãĄńãČđãČČãČĄãĄŮãĄ¿ãĄŹãĂĆ

ãĄŞãĆŇãĄńår¿ãĄŮãĂĄ _ ãĄÍ # ãĄŕå■ŸèłđãĄőãČđãČČãČĄãČşãĆŕãĆĹãĆŁénŸãĄĎåĎłåĚĹéãĘä¡■ãĄğèl'Ţä¿ąãĄŢãĆŇãĄ¿ãĄŹã _ ãĄŕãĂĄ ⋆ åŘŇægŸãĂĄ1äžĕäÿŁãĄőãČđãČČãČĄãČşãĆŕãĄğåŘĹèĞt'åĹd'åőŽãĆŠèąŇãĄĎãĄ¿ãĄŹãĂĆïijĹoneormoreãĆŕãĆd'ã # ãĄŕãĂĄ ^ åŘŇægŸãĂĄ0äžĕäÿŁãĄőãČđãČČãČĄãČşãĆŕãĄğåŘĹèĞt'åĹd'åőŽãĆŠèąŇãĄĎãĄ¿ãĄŹãĂĆïijĹzeroormoreãĆŕãĆd'ã

```
<pattern>ãĄŞãĆŞãĄńãĄąãĄŕ ãĄĎãĄĎåd'l'ærŮãĄğãĄŹãĄ■</pattern>
<pattern>ãĄŞãĆŞãĄńãĄąãĄŕ _</pattern>
<pattern>ãĄŞãĆŞãĄńãĄąãĄŕ #</pattern>
```

ãĄÍãĄĎãĄĘåőŽç¿l'ãĄŇãĄŢãĆŇãĄęãĄĎãĄ§åät'åŘĹãĂĄâĂİãĄŞãĆŞãĄńãĄąãĄŕ ãĄĎãĄĎåd'l'ærŮãĄğãĄŹãĄ■âĂİãĄÍãĄĎãĄĘåĚëåŁŻãĄőåät'åŘĹ # ãĄńãČđãČČãČĄãĄŮãĄ¿ãĄŹãĂĆ

7.4 åĎłåĚĹå■Ÿèłđæ ŇĞåőŽ

$ æŇĞåőŽãĄŮãĄ§å■ŸèłđãĄŕãĂĄ _ , # ãĆĹãĆŁåĎłåĚĹãĄŮãĄęèl'Ţä¿ąãĄŢãĆŇãĄ¿ãĄŹãĂĆ

```
<pattern>ãĄŞãĆŞãĄńãĄąãĄŕ $ãĄĎãĄĎåd'l'ærŮãĄğãĄŹãĄ■</pattern>
<pattern>ãĄŞãĆŞãĄńãĄąãĄŕ _</pattern>
<pattern>ãĄŞãĆŞãĄńãĄąãĄŕ #</pattern>
```

ãĄÍãĄĎãĄĘåőŽç¿l'ãĄŇãĄŢãĆŇãĄęãĄĎãĄ§åät'åŘĹãĂĄâĂİãĄŞãĆŞãĄńãĄąãĄŕ ãĄĎãĄĎåd'l'ærŮãĄğãĄŹãĄ■âĂİãĄÍãĄĎãĄĘåĚëåŁŻãĄőåät'åŘĹäÿĂçŢłäÿŁãĄő-patternãĄńãČđãČČãČĄãĄŮãĄ¿ãĄŹãĂĆ

7.5 åĹd'åőŽåĎłåĚĹéãĘä¡■

patternãĄğãĄőãČŕãĆď'ãČńãČL'ãĆńãČijãČL'æŇĞåőŽæŹĆãĄőåĎłåĚĹéãĘä¡■ãĄŕäžĕäÿŃãĄőãĆĹãĄĘãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

- $(å■Ÿèłđ)
- # (0äžĕäÿŁ)
- _ (1äžĕäÿŁ)
- (å■Ÿèłđ)
- ^ (0äžĕäÿŁ)

- * (1äżĕäÿŁ)

CHAPTER 8

ãČŢãĆąãĆďãČńçőąçŘĘ

åŕ¿èľśãČŮãČľãČČãČĹãČŢãĆľãČijãČäãĄğä¡£çŤĺãĄŹãĆŃãČŢãĆąãĆďãČńãĄńéŰćãĄŮãĄęèłňæŸŐãĄŮãĄ¿ãĄŹãĂĆ

äžěéŹ■ãĄőèłňæŸŐãĄğãĄŕãĂĄäÿžãĄńãĂĄåŕ¿èľśãČŮãČľãČČãČĹãČŢãĆľãČijãČäãĄğåĹľçŤĺãĄŹãĆŃãČŢãĆąãĆďãČńçőąçŘĘæ

ãČŢãĆąãĆďãČńçőąçŘĘæŰźåijŔãĄńãĄŕãĂĄãČ■ãČijãĆńãČńãČŢãĆąãĆďãČńäžěåď ŰãĄńãĆĆãĂĄãČĞãČijãĆ£ãČŹãČijãĆźãĄğã

åőŽç¿ľãČŢãĆąãĆďãČńãĄőæŃąåijţå■ŘãĄŕãĂĄãĆůãČŁãČłãĆłãČŢãĆąãĆďãČńãĄŇaimlãĂĄãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹéĂča
ïijĹãĄİãĄőäżŰãĂĄãĆŕãČľãĆźåőŽç¿ľãČŢãĆąãĆďãČńãĄőconfãĄłãĄľãĆĆä¡£çŤĺãĄŮãĄ¿ãĄŹãĂĆïijĽ

8.1 ãČĞãĆčãČňãĆŕãČĹãČłæğŃæĹŘ

ãĆůãČŁãČłãĆłãČŢãĆąãĆďãČńãĄőãČĞãĆčãČňãĆŕãČĹãČłæğŃæĹŘãĄŕäžěäÿŃãĄőãĄĺãĄŁãĆŁãĄğãĄŹãĂĆ

```
storage åŘĎçĺőãČŢãĆąãĆďãČńãČĞãĆčãČňãĆŕãČĹãČł
âŤIJâŤĂâŤĂ braintree AIMLåśŢéŰŃãČŢãĆąãĆďãČńãČĞãĆčãČňãĆŕãČĹãČł
âŤIJâŤĂâŤĂ categories ãĆůãČŁãČłãĆłãČŢãĆąãĆďãČńãČĞãĆčãČňãĆŕãČĹãČł
âŤĆ   âŤŤâŤĂâŤĂ *.aiml
âŤIJâŤĂâŤĂ conversations åŕ¿èl'śåśěæ■t'æČĚåăśãČĞãĆčãČňãĆŕãČĹãČł
âŤĆ   âŤŤâŤĂâŤĂ *.conv
âŤIJâŤĂâŤĂ debug ãČĞãČŘãČČãĆŕæČĚåăśãČĞãĆčãČňãĆŕãČĹãČł
âŤĆ   âŤIJâŤĂâŤĂ duplicates.txt
âŤĆ   âŤIJâŤĂâŤĂ errors.txt
âŤĆ   âŤIJâŤĂâŤĂ errors_collection.txt
âŤĆ   âŤŤâŤĂâŤĂ *.log
âŤIJâŤĂâŤĂ learnf åŃŢçŽĎçŤ$æĹŘãĆůãČŁãČłãĆłãČŢãĆąãĆďãČńãČĞãĆčãČňãĆŕãČĹãČł
âŤĆ   âŤŤâŤĂâŤĂ *.aiml
âŤIJâŤĂâŤĂ licences ãČl'ãĆd'ãĆżãČşãĆźãČŢãĆąãĆďãČńãČĞãĆčãČňãĆŕãČĹãČł
âŤĆ   âŤŤâŤĂâŤĂ license.keys.txt
âŤIJâŤĂâŤĂ lookups ç¡őæŔŽè¿dæŽÿãČŢãĆąãĆďãČńãČĞãĆčãČňãĆŕãČĹãČł
âŤĆ   âŤIJâŤĂâŤĂ regex.txt
âŤĆ   âŤIJâŤĂâŤĂ denormal.txt
âŤĆ   âŤIJâŤĂâŤĂ gender.txt
```

(continues on next page)

(continued from previous page)

```
âŤĆ   âŤIJâŤĂâŤĂ normal.txt
âŤĆ   âŤIJâŤĂâŤĂ person.txt
âŤĆ   âŤŤâŤĂâŤĂ person2.txt
âŤIJâŤĂâŤĂ maps mapãČłãĆźãČĹãČŢãĆąãĆd’ãČńãČĞãĆčãČňãĆŕãČĹãČł
âŤĆ   âŤŤâŤĂâŤĂ *.txt
âŤIJâŤĂâŤĂ nodes èęAçt’ååĞęçŘEąĆŕãČl’ãĆźåőŽç¿l’ãČŢãĆąãĆd’ãČńãČĞãĆčãČňãĆŕãČĹãČł
âŤĆ   âŤIJâŤĂâŤĂ pattern_nodes.conf
âŤĆ   âŤŤâŤĂâŤĂ template_nodes.conf
âŤIJâŤĂâŤĂ properties ãČŮãČ■ãČŚãČEąĆčåőŽç¿l’ãČŢãĆąãĆd’ãČńãČĞãĆčãČňãĆŕãČĹãČł
âŤĆ   âŤIJâŤĂâŤĂ nlu_servers.yaml
âŤĆ   âŤIJâŤĂâŤĂ botnames.yaml
âŤĆ   âŤIJâŤĂâŤĂ rest_templates.yaml
âŤĆ   âŤIJâŤĂâŤĂ defaults.txt
âŤĆ   âŤIJâŤĂâŤĂ properties.txt
âŤĆ   âŤŤâŤĂâŤĂ json␣
↪JSONå¡ćåijŔãČŮãČ■ãČŚãČEąĆčåőŽç¿l’ãČŢãĆąãĆd’ãČńãČĞãĆčãČňãĆŕãČĹãČł
âŤĆ       âŤŤâŤĂâŤĂ *.json
âŤIJâŤĂâŤĂ prosessing æŰĞçůÍéŻEąĆŕãČl’ãĆźåőŽç¿l’ãČŢãĆąãĆd’ãČńãČĞãĆčãČňãĆŕãČĹãČł
âŤĆ   âŤIJâŤĂâŤĂ preprocessors.conf
âŤĆ   âŤŤâŤĂâŤĂ postprocessors.conf
âŤIJâŤĂâŤĂ rdfs RDFãČŢãĆąãĆd’ãČńãČĞãĆčãČňãĆŕãČĹãČł
âŤĆ   âŤŤâŤĂâŤĂ *.txt
âŤIJâŤĂâŤĂ security ãĆżãĆ■ãČěãČłãČEąĆčãČŢãĆąãĆd’ãČńãČĞãĆčãČňãĆŕãČĹãČł
âŤĆ   âŤŤâŤĂâŤĂ usergroups.yaml
âŤIJâŤĂâŤĂ sets setãČłãĆźãČĹãČŢãĆąãĆd’ãČńãČĞãĆčãČňãĆŕãČĹãČł
âŤĆ   âŤŤâŤĂâŤĂ *.txt
âŤŤâŤĂâŤĂ spelling ãĆźãČžãČńãČĄãĆğãČčãĆŕãČŢãĆąãĆd’ãČńãČĞãĆčãČňãĆŕãČĹãČł
    âŤŤâŤĂâŤĂ corpus.txt
```

8.2 ãĆĺãČşãČEąĆčãČEąĆč

åŕ¿èl’śãČŮãČl’ãČČãČĹãČŢãĆl’ãČijãČäĄgãĄŕãĂĄæäijçt’■ãĄŹãĆŃãČĞãČijãĆ£ãĄőçĺőéąđãĄńãĆĹãĄčãĄęãĆĺãČşãČEąĆčãČEąĆ

åĹl’çŤĺãĄŹãĆŃãČŢãĆąãĆd’ãČńãĄőæğŃæĹŘãĄŕãĂĄãĆşãČşãČŢãĆčãĆřãČŢãĆąãĆd’ãČń(config.yaml)ãĄğåőŽç¿l’ãĄŮãĂĄãĄl’ã

åřŽãĂĄãĆĺãČşãČEąĆčãČEąĆčãĄńãĄŕãĂĄåËśéĂŽçŽĐãĄńä¡£çŤĺãĄŹãĆŃãĆĆãĄőãĄĺãĂĄçL’źåőŽèęAçt’ääĄőãĄ£ãĄğä¡£çŤĺãĄ

äžëäÿŃãĄőãĆĺãČşãČEąĆčãČEąĆčãĄőäÿ■ãĄğãĂĄâĂİèĞłåŃŢçŤ§æĹŘâĂİãĄÑâĂİNoâĂİãĄőãČĞãČijãĆ£ãĄŕçůÍéŻEąĄÑåŔŕèČ¡

âĂIJå■ŸäÿĂãČŢãĆąãĆd’ãČńâĂİãĄÑâĂİYesâĂİãĄőãČĞãČijãĆ£ãĄŕår¿èśąãČŢãĆąãĆd’ãČńãĆŠ1ãĄd’ãĄäãĄŚæŇĞåőŽãĄğãĄ■ã

- åËśéĂŽãĄőãĆĺãČşãČEąĆčãČEąĆč

ãĆĺãČşãČĘãĆčãČĘåőź	ãĆčãČĘãĆĺãČşãČĘãĆčãČĘåőź	å■Ÿåy	ãĆĺãČş	ãĆçãČĘãĆĺãČşãČĘãĆčãČĘåőź
binaries	ãČĎãČłãČijãČĞãČijãĆ£	No	Yes	AIMLãĆŠåśŢéŰŃãĄŮãĄ§æďĲçť ćçŤĺãČĎãČłãČijãĄőãČŘãĆď ãČŁ
braintree	ãČĎãČłãČijãČĞãČijãĆ£	No	Yes	AIMLãĆŠåśŢéŰŃãĄŮãĄ§æďĲçť ćçŤĺãČĎãČłãČijãĄőXMLå¡ćåijŘã
categories	åŕ¿èľ śçŤĺAIML	No	No	åŕ¿èľ śãĄőåĹűå¿ąãĄńä¡£çŤĺãĄŹãĆŃAIMLãČŢãĆąãĆďãČńç¿ďãĆŠ
conversations	åŕ¿èľ śåśéæ■ť æČĚåäś	No	Yes	ãČęãČijãĆűæŕŐãĄőéĄŐåŐżãĆŠåŘńãĆĄãĄ§åŕ¿èľ śåĞęçŘĘåĚĘåőź(
defaults	ãČŮãČ■ãČŠãČĘãĆčãČłãĆźãČĹ	Yes	No	åĹİæĲ§èţůåŃŢæŹĆãĄńåśŢéŰŃãĄŹãĆŃãČřãČ■ãČijãČŘãČńåďĽæŢ
duplicates	éĞ■èďĞæŇĞåőŽæČĚåäś	Yes	Yes	(ãČĞãČŘãČČãĆřçŤĺïijĽ AIMLãČŢãĆąãĆďãČńåśŢéŰŃæŹĆãĄőcate
errors	ãĆĺãČľãČijæČĚåäś	Yes	Yes	(ãČĞãČŘãČČãĆřçŤĺïijĽ AIMLãČŢãĆąãĆďãČńåśŢéŰŃæŹĆãĄőãĆĺã
errors_collection	ćŻżéŇšãĆĺãČľãČijæČĚåäś	Yes	Yes	(ãČĞãČŘãČČãĆřçŤĺïijĽè¿đæŻÿãĄłãĄľãĄőåŘĎçĺőåőŽç¿ľãČŢãĆąã
license_keys	ãČľãĆďãĆżãČşãĆźãĆ■ãČij	Yes	No	åďŰéČĺæŐěçűŽç■Ľ ãĄğå£ĚèęĄãĄńãĄłãĆŃãČľãĆďãĆżãČşãĆźãĆ■
pattern_nodes	ãĆŕãČľãĆźåőŽç¿ľãČłãĆźãČĹ	Yes	No	patternãĄőåŘĎèęĄçť ăãĄőåĞęçŘĘãĆŕãČľãĆźåőŽç¿ľãČŢãĆąãĆďã
postprocessors	ãĆŕãČľãĆźåőŽç¿ľãČłãĆźãČĹ	Yes	No	ãČńãĆźãČİãČşãĆźãĄőå£ĲçŤæŰĞãĄńåŕ¿ãĄŮãĄęçůléŽĘãĆŠèąŇã
preprocessors	ãĆŕãČľãĆźåőŽç¿ľãČłãĆźãČĹ	Yes	No	ãČłãĆŕãĆĺãĆźãČĹãĄőãČęãČijãĆűçŽžèľ śãĄńåŕ¿ãĄŮãĄęçůléŽĘãĆŠ
properties	ãČŮãČ■ãČŠãČĘãĆčãČłãĆźãČĹ	Yes	No	patternãĄő *bot* ãĂĄåŘĿãĄşãĂĄtemplateãĄő *bot* èęĄçť ăãĄğä¡£çŤĺãĄŹãĆŃãČŮãČ■ãČŠãČĘãĆčåőŽç¿ľãČŢãĆąãĆďã
properties_json	JSONå¡ćåijŘãČŮãČ■ãČŠãČĘãĆč	No	No	äÿżãĄńtemplateãĄő *bot* èęĄçť ăãĄğä¡£çŤĺãĄŹãĆŃJSONå¡ćåijŘãČŮãČ■ãČŠãČĘãĆčãČŢãĆą
spelling_corpus	ãĆźãČŽãČńãČĄãĆğãČČãĆŕæČĚåäś	No	No	ãĆźãČŽãČńãČĄãĆğãČČãĆŕãĆŠèąŇãĄĘåäť åŘĹãĄőãĆĆãĄĺãĄńãĄł
template_nodes	ãĆŕãČľãĆźåőŽç¿ľãČłãĆźãČĹ	Yes	No	templateãĄőåŘĎèęĄçť ăãĄőåĞęçŘĘãĆŕãČľãĆźåőŽç¿ľãČŢãĆąãĆďã

- PatternèęĄçť ăçŤĺãĄőãĆĺãČşãČĘãĆčãČĘãĆč

ãĆĺãČşãČĘãĆčãČĘåőź	ãĆčãČĘãĆĺãČşãČĘãĆčãČĘåőź	å■Ÿåy	ãĆĺãČş	ãĆçãČĘãĆĺãČşãČĘãĆčãČĘåőź
regex_templates	æ■čèęŔèąĺçŔ¿ãČłãĆźãČĹ	Yes	No	*regex* èęĄçť ăãĄőtemplateæŇĞåőŽãĄğä¡£çŤĺãĄŹãĆŃæ■čèęŔèąĺçŔ¿ãČłãĆźãČĹãČŢãĆąã
sets	åŕ¿èśąå■ŸèłđãČłãĆźãČĹ	No	No	*set* èęĄçť ăãĄğä¡£çŤĺãĄŹãĆŃå■ŸèłđãČłãĆźãČĹãČŢãĆąãĆďãČńãĆŠ

- TemplateèęĄçť ăçŤĺãĄőãĆĺãČşãČĘãĆčãČĘãĆč

ãĆĺãČşãČĘãĆčãČĘåőź	ãĆčãČĘãĆĺãČşãČĘãĆčãČĘåőź	å■Ÿåy	ãĆĺãČş	ãĆçãČĘãĆĺãČşãČĘãĆčãČĘåőź
denormal	åďĽæŔŻè¿đæŻÿ	Yes	No	*denormalize* èęĄçť ăãĄğãĄőåďĽæŔŻãĄńä¡£çŤĺãĄŹãĆŃè¿đæŻÿãČŢ
gender	åďĽæŔŻè¿đæŻÿ	Yes	No	*gender* èęĄçť ăãĄğãĄőåďĽæŔŻãĄńä¡£çŤĺãĄŹãĆŃè¿đæŻÿãČŢãĆą
learnf	categoryãČłãĆźãČĹ	No	YES	*learnf* èęĄçť ăãĄőåĞęçŘĘãĄğä¡ĲæĹŘãĄŢãĆŃãĆŃcategoriesæČĚåä
logs	ãČ■ãĆřæČĚåäś	No	YES	*log* èęĄçť ăãĄőåĞęçŘĘãĄğä¡ĲæĹŘãĄŢãĆŃãĄ§ãČ■ãĆřæČĚåäśãĆŠ
maps	ãČŮãČ■ãČŠãČĘãĆčãČłãĆźãČĹ	No	No	*map* èęĄçť ăãĄğãĄőåďĽæŔŻãĄńä¡£çŤĺãĄŹãĆŃè¿đæŻÿãČŢãĆąãĆ
normal	åďĽæŔŻè¿đæŻÿ	Yes	No	*normalize* èęĄçť ăãĄğãĄőåďĽæŔŻãĄńä¡£çŤĺãĄŹãĆŃè¿đæŻÿãČŢã
person	åďĽæŔŻè¿đæŻÿ	Yes	No	*person* èęĄçť ăãĄğãĄőåďĽæŔŻãĄńä¡£çŤĺãĄŹãĆŃè¿đæŻÿãČŢãĆą
person2	åďĽæŔŻè¿đæŻÿ	Yes	No	*person2* èęĄçť ăãĄğãĄőåďĽæŔŻãĄńä¡£çŤĺãĄŹãĆŃè¿đæŻÿãČŢãĆą
rdf	RDFãČĞãČijãĆ£ãČłãĆźãČĹ	No	No	*RDF* éŰćéĂčèęĄçť ăãĄőåĞęçŘĘåŕ¿èśąãĄĺãĄłãĆŃRDFãČĞãČijãĆ£ã
usergroups	ãĆżãĆ■ãČěãČłãČĘãĆčæČĚåäś	Yes	No	*authorise* èęĄçť ăãĄğä¡£çŤĺãĄŹãĆŃãČ■ãČijãČńåőŽç¿ľãČŢãĆąãĆď

- ãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹéĂčæŘžçŤĺãĄőãĆĺãČşãČĘãĆčãČĘãĆč

ãĆĺãČşãČĘãĆčãČĘåőź	ãĆčãČĘãĆĺãČşãČĘãĆčãČĘåőź	å■Ÿåy	ãĆĺãČş	ãĆçãČĘãĆĺãČşãČĘãĆčãČĘåőź
nlu_servers	åĹľçŤĺNLUæŐěçűŽæČĚåäś	Yes	No	NLUãČđãČČãČĄãČşãĆřåŕ¿èśąãĄőNLUãĄĺãĂĄ *sraix* èęĄçť ăãĄğåő§æŰ¡ãĄŹãĆŃNLUéĂŽä£ąãĄńä¡£çŤĺãĄŹãĆŃãĆčãĆŕã
bot_names	åĚňéŰŃBotæŐěçűŽæČĚåäś	Yes	No	*sraix* èęĄçť ăãĄğåő§æŰ¡ãĄŹãĆŃåĚňéŰŃBotãĄĺãĄőéĂŽä£ąãĄńä¡£ç
rest_templates	RESTéĂŽä£ąéŻŻå¡ćæČĚåäś	Yes	No	*sraix* èęĄçť ăãĄğåő§æŰ¡ãĄŹãĆŃæśŐçŤĺRESTéĂŽä£ąãĄğä¡£çŤĺãĄŹ

8.3 ãČ■ãČijãĆńãČńãČŢãĆąãĆď'ãČńåĹľçŤĺæŹĆãĄőåőŽç¿ľä¿Ń

8.3.1 ãĆĺãČşãČĘãĆčãČĘãĆčåőŽç¿ľ

äžěäÿŃãĄőä¿ŃãĄŕãĂĄconsole
ãĄĺãĄĎãĄĘåŘ■åĽ■ãĄőãĆŕãČľãĆď'ãĆćãČşãČĹãĆŠä¡£çŤĺãĄŮãĄ§åăť'åŘĹãĄőãĆĺãČşãČĘãĆčãČĘãĆčãĄőåőŽç¿ľ'ä¿ŃãĄğãĄŹãĂ
ãĆŕãČľ'ãĆď'ãĆćãČşãČĹãĄóè■åőŽãĄğãĄŕãĂĄ storage ãĄĺãĄĎãĄĘãĆżãĆŕãĆůãČğãČşãĄńãĂĄ
entities ãĄĺãĄĎãĄĘãĆţãČŰãĆżãĆŕãĆůãČğãČşãĄŇãĄĆãĆŁãĄ¿ãĄŹãĂĆ

ãČŢãĆąãĆď'ãČńãĄőçőąçŘĘæŰźæşŢãĄĺãĄŮãĄęãĂĄåŘĎãĆĺãČşãČĘãĆčãČĘãĆčæŕŐãĄńåĚěåĞžåŁŻãĄőåĹűå¿ąãĆŠèąŇãĄĘæŰź
ãĄŞãĄŞãĄğãĄŕãĂĄãĆźãČĹãĆćæŰźåijŔåŘ■ïijŽfile ãĆŠæŇĞåőŽãĄŮãĄęãĄĎãĄ¿ãĄŹãĂĆ

```
console:
  storage:
      entities:
          binaries: file
          braintree: file
          categories: file
          conversations: file
          defaults: file
          duplicates: file
          errors: file
          errors_collection: file
          license_keys: file
          pattern_nodes: file
          postprocessors: file
          preprocessors: file
          properties: file
          properties_json: file
          spelling_corpus: file
          template_nodes: file
          regex_templates: file
          sets: file
          denormal: file
          gender: file
          learnf: file
          logs:   file
          maps: file
          normal: file
          person: file
          person2: file
          rdf: file
          nlu_servers: file
          bot_names: file
          rest_templates: file
          usergroups: file
```

8.3.2 fileãĆźãČĹãČńãČijãĆÿãĆĺãČşãĆÿãČşãĄőåőŽç¿ľ

åŘŇãĄŸ storageãĆżãĆŕãĆůãČğãČşãĄőãĆţãČŰãĆżãĆŕãĆůãČğãČşs-
toresãĄğãĂĄãĆźãČĹãĆćåĘĚãĄğãĄőåő§åĞęçŘĘãĆŠèąŇãĄĘãĆźãČĹãČńãČijãĆÿãĆĺãČşãĆÿãČşãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
ãĄŞãĄŞãĄğãĄŕãĂĄãĆźãČĹãĆćåŘ■ïijŽfileãĄńår¿ãĄŮãĄęãĂĄâĂİtype:
fileâĂİãĄğãĂĄãČ■ãČijãĆńãČńãČŢãĆąãĆď'ãČńãĄőåĚěåĞžåŁŻãĆŠèąŇãĄĘãĆźãČĹãČńãČijãĆÿãĆĺãČşãĆÿãČşãĆŠåĹ'çŤĺãĄŹãĆ

ãČ■ãČijãĆńãČńãČŢãĆąãĆď'ãČńåĚěåĞžåŁŻïijĹfileæŇĞåőŽïijL'ãĄőåăť'åŘĹãĂĄåő§åĞęçŘĘãĆŠèąŇãĄĘãĆźãČĹãČńãČijãĆÿãĆĺã
ãĆĺãČşãČĘãĆčãČĘãĆčåŘ■+'_storage' ãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

ãĆĺãČşãČĘãĆčãČĘãĆčæŕŐãĄőãĆźãČĹãČňãČijãĆÿãĆĺãČşãĆÿãČşãĄőèĺ■åőŽãĄŕãĂĄäżëäÿŃãĄőãĆĹãĄĘãĄń
âĂŸconfigâĂŹãĆţãČŰãĆżãĆŕãĆůãČğãČşãĄğèąŇãĄĎãĄ¿ãĄŹãĂĆ

```
stores:
    file:
        type: file
        config:
          binaries_storage:
            file: ./storage/braintree/braintree.bin
          braintree_storage:
            file: ./storage/braintree/braintree.xml
          categories_storage:
            dirs: ./storage/categories
            subdirs: true
            extension: aiml
          conversations_storage:
            dirs: ./storage/conversations
          defaults_storage:
            file: ./storage/properties/defaults.txt
          duplicates_storage:
            file: ./storage/debug/duplicates.txt
          errors_storage:
            file: ./storage/debug/errors.txt
          errors_collection_storage:
            file: ./storage/debug/errors_collection.txt
          license_keys_storage:
            file: ./storage/licenses/license.keys
          pattern_nodes_storage:
            file: ./storage/nodes/pattern_nodes.conf
          postprocessors_storage:
            file: ./storage/processing/postprocessors.conf
          preprocessors_storage:
            file: ./storage/processing/preprocessors.conf
          properties_storage:
            file: ./storage/properties/properties.txt
          properties_json_storage:
            dirs: ./storage/properties/json
            extension: json
          spelling_corpus_storage:
            file: ./storage/spelling/corpus.txt
          template_nodes_storage:
            file: ./storage/nodes/template_nodes.conf
          regex_templates_storage:
            file: ./storage/lookups/regex.txt
          sets_storage:
            dirs: ./storage/sets
            extension: txt
          denormal_storage:
            file: ./storage/lookups/denormal.txt
          gender_storage:
            file: ./storage/lookups/gender.txt
          learnf_storage:
            dirs: ./storage/learnf
          logs_storage:
            dirs: ./storage/debug
          maps_storage:
            dirs: ./storage/maps
            extension: txt
          normal_storage:
            file: ./storage/lookups/normal.txt
          person_storage:
```

(continues on next page)

(continued from previous page)

```
    file: ./storage/lookups/person.txt
  person2_storage:
    file: ./storage/lookups/person2.txt
  rdf_storage:
    dirs: ./storage/rdfs
    subdirs: true
    extension: txt
  nlu_servers_storage:
    dirs: ./storage/properties/nlu_servers.yaml
  bot_names_storage:
    dirs: ./storage/properties/botnames.yaml
  rest_templates_storage:
    dirs: ./storage/properties/rest_templates.yaml
  usergroups_storage:
    file: ./storage/security/usergroups.yaml
```

âĂŸconfigâĂŹãĆţãČŰãĆżãĆŕãĆůãČğãČşãĄğãĄőåőŽç¿l'ãĄŕãĂĄåŕ¿èśąãĄĺãĄłãĆŃãĆĺãČşãČĘãĆčãČĘãĆčãĄńãĆĹãĄčãĄęãĂĄå■

8.3.3 å■ŸäÿĂãČŢãĆąãĆd'ãČńãĄőãĆĺãČşãČĘãĆčãČĘãĆčãĄőåăť'åŘĹ

å■ŸäÿĂãČŢãĆąãĆd'ãČńãĆŠæŇĞåőŽãĄŹãĆŃãĆĺãČşãČĘãĆčãČĘãĆčãĄőåăť'åŘĹãĂĄâĂŹfileâĂŹåśđæĂğãĄğãČŢãĆąãĆd'ãČńãČ

```
usergroups_storage:
    file: ./storage/security/usergroups.yaml
```

8.3.4 èd'ĞæŢřãČŢãĆąãĆd'ãČńãĄőåĽ'çŤĺãĄŇåŘŕèČ¡ãĄłãĆĺãČşãČĘãĆčãČĘãĆd'ãĄőåăť'åŘĹ

èd'ĞæŢřãČŢãĆąãĆd'ãČńãĄŇåĹ'çŤĺåŘŕèČ¡ãĄłãĆĺãČşãČĘãĆčãČĘãĆčãĄőåăť'åŘĹãĂĄäžěäÿŃãĄő3ãĄd'ãĄőåśđæĂğãĆŠæŇĞåőŽ
ãĄ§ãĄăãĄŮãĂĄèĞłåŃŢçŤ§æĹŘår¿èśąãĄőãĆĺãČşãČĘãĆčãČĘãĆčãĄőåăť'åŘĹãĂĄãČĞãĆčãČńãĆŕãČĹãČłãČŠãĆźãĄőãĄ£ãĄőæ

- dirs: år¿èśąãČŢãĆąãĆd'ãČńãČĞãĆčãČńãĆŕãČĹãČłãČŠãĆźãĆŠæŇĞåőŽãĂĆ
- subdirs: år¿èśąãČŢãĆąãĆd'ãČńãČĞãĆčãČńãĆŕãČĹãČłéÉ■äÿŃãĄőãĆţãČŰãČĞãĆčãČńãĆŕãČĹãČłãĆŠãĆţãČijãČĄãĄŹãĆŃ
- extension: ãČ■ãČijãČL'ãĄŹãĆŃãČŢãĆąãĆd'ãČńãĆ£ãĆd'ãČŮãĄőæŃąåijţå■ŘãĆŠæŇĞåőŽãĂĆ

```
categories_storage:
  dirs: ./storage/categories
  subdirs: true
  extension: aiml

conversations_storage:
  dirs: ./storage/conversations
```

åřŽãĂĄèĞłåŃŢçŤ§æĹŘår¿èśąåd'ŰãĄgãĂĄèd'ĞæŢřãČŢãĆąãĆd'ãČńãĆŠæŇĞåőŽãĄŹãĆŃãĄŞãĄĺãĄŇåŘŕèČ¡ãĄłãĆźãČĹãČňãČ

- categories_storage
- sets_storage
- maps_storage
- properties_json_storage
- rdf_storage

âĂżsets_storage/maps_storage/properties_json_storageãĄŕãĂĄãČŢãĆąãĆd'ãČńåŘ■ãĆŠè■ŸåĹěå■ŘãĄĺãĄŮãĄęåĹl'çŤĺãĄŹãĆŃãĄ
âĂŸsubdirs: falseâĂŹ ãĆŠæŇĞåőŽãĄŹãĆŃãĄŞãĄĺãĆŠæŐĺåěĺãĄŮãĄ¿ãĄŹãĂĆ

8.4 ãČĞãČijãĆ£ãČŹãČijãĆźåĹľçŤĺæŹĆãĄőåŐžç¿ľä¿Ń

ãČĞãČijãĆ£ãČŹãČijãĆźãĄğçőąçŘĘãĄŹãĆŃåăť åŘĹãĄőä¿ŃãĄĺãĄŮãĄęãĂĄRedisãĆŠåĹľçŤĺãĄŮãĄ§ä¿ŃãĆŠäžëäÿŃãĄńçď žãA

8.4.1 ãĆĺãČşãČĘãĆčãČĘãĆčåőŽç¿ľ

RedisãĄğçőąçŘĘãĄŹãĆŃãĆĺãČşãČĘãĆčãČĘãĆčãĄńår¿ãĄŮãĄęãĂĄstorageãĄőentitiesãĆţãČŰãĆżãĆŕãĆůãČğãČşãĄğãĂĄãĆźãČ
ãĆŠæŇĞåőŽãĄŮãĄęãĄĎãĄ¿ãĄŹãĂĆ

```
console:
  storage:
      entities:
          binaries: redis
          braintree: redis
          categories: file
          ïijŽ
```

RedisãĄğãĄőåĚëåĞžåŁŻãĄŇåŘŕèČ¡ãĄłãĆĺãČşãČĘãĆčãČĘãĆčãĄŕãĂĄäžëäÿŃãĄőãĆĆãĄőãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

- binaries ïijŽ AIMLãĆŠåśŢéŰŃãĄŮãĄ§æď IJçť ćçŤĺãČĎãČłãČijãĄőãČŘãĆď ãČŁãČłãČĞãČijãĆ£ãĆŠæăijçť ■ãĂĆ
- braintree ïijŽ AIMLãĆŠåśŢéŰŃãĄŮãĄ§æď IJçť ćçŤĺãČĎãČłãČijãĄőXMLå¡ćåijŔãČĞãČijãĆ£ãĆŠæăijçť ■ãĂĆ
- conversations ïijŽ ãČęãČijãĆűæŕÕãĄőéĄŐåŐżãĆŠåŘńãĆĄãĄ§åŕ¿èľ śåĞęçŘĘåĘĚåőź(åď L’æŢřåĂď ãĆŠåŘńãĆĂ)ãĄőåśěæ■
- duplicates ïijŽ (ãČĞãČŘãČČãĆŕçŤĺïijL’AIMLãČŢãĆąãĆď ãČńåśŢéŰŃæŹĆãĄőcategoryéĞ■èď ĞæČĚåăśãĆŠæăijçť ■ãĂĆ
- errors ïijŽ (ãČĞãČŘãČČãĆŕçŤĺïijL’AIMLãČŢãĆąãĆď ãČńåśŢéŰŃæŹĆãĄőãĆĺãČľ ãČijæČĚåăśãĆŠæăijçť ■ãĂĆ
- errors_collection ïijŽ (ãČĞãČŘãČČãĆŕçŤĺïijL’è¿đæŻÿãĄłãĄľ ãĄőåŘĎçĺőåőŽç¿ľ ãČŢãĆąãĆď ãČńçŹżéŇšæŹĆãĄőãĆĺãČľ ãČ
- learnf ïijŽ *learnf* èęĄçť ăăĄőåĞęçŘĘãĄğä¡IJæĹŘãĄŢãĆŇãĆŃcategoriesæČĚåăśãĆŠãĂĄãČęãČijãĆűæŕÕãĄńæăijçť ■ãĂĆ
- logs ïijŽ *log* èęĄçť ăăĄőåĞęçŘĘãĄğä¡IJæĹŘãĄŢãĆŇãĄ§ãČ■ãĆŕæČĚåăśãĆŠãĂĄãČęãČijãĆűæŕÕãĄńæăijçť ■ãĂĆ

8.4.2 RedisãĆźãČĹãČňãČijãĆÿãĆĺãČşãĆÿãČşãĄőåőŽç¿ľä¿Ń

storageãĆżãĆŕãĆůãČğãČşãĄőstoresãĄőãĆţãČŰãĆżãĆŕãĆůãČğãČşãĄğãĂĄãĆźãČĹãĆćåŘ■ïijŽredisãĄńår¿ãĄŮãĄęãĂĄâĂİtype:
redisâĂİãĄğãĂĄRedisãĄńår¿ãĄŹãĆŃåĚëåĞžåŁŻãĆŠèąŇãĄĘãĄŞãĄĺãĆŠæŇĞåőŽãĄŮãĄęãĄĎãĄ¿ãĄŹãĂĆ

âĂŸconfigâĂŹãĆţãČŰãĆżãĆŕãĆůãČğãČşãĄğãĂĄãĂĄRedisãĄőåĹľçŤĺãĄńå£ÈèęĄãĄłåĚśéĂŽãČŠãČľãČąãČijãĆ£ãĆŠæŇĞåőŽãA

```
stores:
   redis:
       type: redis
       config:
           host: localhost
           port: 6379
           db: 0
           prefix: programy
           drop_all_first: false
           username: xxx
           password: xxx
           ssl: false
           timeout: 1
```

åřŽãĂĄ`username` ãĄŕãĂĄredis-server:V6.0äžëéŹ■ãĄőåĹľçŤĺæŹĆãĄńæŇĞåőŽãĄŇåŘŕèČ¡ãĄğãĄŹãĂĆ

8.5 åőŽç¿ľãČŢãĆąãĆďãČńãĄőèĺŸè£řæŰźæşŢ

çůĺéŻĘåŔŕèČ¡ãĄłãČŢãĆąãĆďãČńãĄgãĂĄAIMLäžěåď˘ŰãĄńãĂąä¡£çŤĺãĄŹãĆŃãĄŞãĄĺãĄőåď˘ŽãĄĎåőŽç¿ľãČŢãĆąãĆďãČńãĄ

åŘĎåőŽç¿ľãČŢãĆąãĆďãČńãĄŕãĂĄãĆůãČŁãČłãĆŀïijĹAIMLïijL˘ãĄőèğčæđŘåL˘■ãĄńåśŢéŰŃãĄŮãĄ¿ãĄŹãĂĆãĄŞãĄőçĆžãĂĄå
Brain ãĆşãČşãČŢãĆčãĆřãČńãČijãĆůãČğãČş
ãĄńäžëäÿŃãĄőåőŽç¿ľãĆŠèąÑãĄĘãĄŞãĄĺãĄgãĂĄåŘĎåőŽç¿ľãČŢãĆąãĆďãČńåśŢéŰŃæŹĆãĄőçŢřåÿÿæČĚåăśãĆŠãĄ¿ãĄĺãĆĄã
`errors_collection`
ãĆĺãČşãČĘãĆčãČĘãĆčãĄgæŇĞåőŽãĄŮãĄ§ãČŢãĆąãĆďãČńãĄńåĞžåŁŻãĄŹãĆŃãĄŞãĄĺãĄÑãĄgãĄ■ãĄ¿ãĄŹãĂĆ

```
brain:
  debugfiles:
    save-errors_collection: true
```

8.5.1 ãČŮãČ■ãČŚãČĘãĆčãČłãĆźãČĹãČŢãĆąãĆďãČń

äžěäÿŃãĄőãĆĺãČşãČĘãĆčãČĘãĆčãĄgæŇĞåőŽãĄŹãĆŃãČŢãĆąãĆďãČńãĄŕãĂĄbotãĄőãČŮãČ■ãČŚãČĘãĆčãĆĎåď˘L˘æŢřãĄÿãA
âĂŹåŘ■çğř: åĂď˘âĂŹ ãĄőå¡ćåijŔãĄgèĺŸè£řãĄŮãĄ¿ãĄŹãĂĆ

- defaults ïijŽ ãĆřãČ■ãČijãČŘãČńåď˘L˘æŢř(name)ãĄőåĹİæIJ§åĂď˘ãĆŠåőŽç¿ľãĂĆ
- properties : patternãĄő *bot*ãĂĄåŘŁãĄşãĂĄtemplateãĄő *bot* èęAçt˘ăăĄgä¡£çŤĺãĄŹãĆŃbotãĄőãČŮãČ■ãČŚãČĘãĆčãĆŠåőŽ

defaults

`defaults`
ãĆĺãČşãČĘãĆčãČĘãĆčãĄgãĄŕãĂĄãĆůãČŁãČłãĆłãĄgä¡£çŤĺãĄŹãĆŃãĆřãČ■ãČijãČŘãČńåď˘L˘æŢř(name)ãĄőåĂď˘èĺ■åőŽãĆŠåĹİ

ãĄ§ãĄăãĄŮãĂĄãČęãČijãĆűæŕŐãĄőår¿èľśæČĚåăśåśěæ■t˘ãĄŇå■ŸåIJĺãĄŹãĆŃåăt˘åŘĹãĄŕãĂĄåśěæ■t˘äÿŁãĄőæIJĂæŰřåĂď˘ãĄŃ

äžěäÿŃãĄőä¿ŃãĄgãĄŕãĂĄinitial_variable(nameåď˘L˘æŢř)ãĄőåĂď˘ãĄĺãĄŮãĄęãĂĄãČęãČijãĆűæŕŐãĄőåĹİåŻđår¿èľśæŹĆãĄńâĂ

```
initial_variable: åĹİæIJ§åĂd’
```

properties

`properties` ãĆĺãČşãČĘãĆčãČĘãĆčãĄŕãĂĄtemplateãĄő *bot*
èęAçt˘ăăĄgãĄőæČĚåăśåŘŰå¿ŮãĄńä¡£çŤĺãĄŹãĆŃãĄĺãĄĺãĆĆãĄńãĂĄãČđãČČãČąãČşãĆřãĄgæŇĞåőŽãĄŹãĆŃ
bot èęAçt˘ăăĄgãĆĆä¡£çŤĺãĄgãĄ■ãĄ¿ãĄŹãĂĆ
JSONå¡ćåijŔãĄőåĂď˘ãĆŠèĺ■åőŽãĄŹãĆŃåăt˘åŘĹãĄńãĄŕãĂĄ`properties_json`
ãĆĺãČşãČĘãĆčãČĘãĆčãĆĆä¡£çŤĺãĄgãĄ■ãĄ¿ãĄŹãĂĆ

name		*bot*
birthdate		*bot*
grammar_version		*bot*
app_version		*bot*
version		*program*

default-response			
exception-response			
default-get		*get*	
default-property			*property*
default-map			*map*
joiner_terminator			
splitter_regex			
punctuation_regex			
before_regex			
after_regex			

`default-get` *json* RDF *select* `default-property` `default-map`

-

```
name:
birthdate:March 01, 2019

version: v0.0.1
grammar_version:0.0.1
app_version: 0.0.1

default-response:
exception-response:
default-get:
default-property:
default-map:

joiner_terminator:
```

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(continued from previous page)

```
joiner_join_chars: .?!ãĂĆïij$ïijĄ
splitter_split_chars:  ãĂĆ
punctuation_chars: ;'",!()[]ïijžâĂźâĂİïijżãĂĄãĂĆïijĄïijĹïijL’ãĂÑãĂ■
before_concatenation_rule: .*[a-z]
after_concatenation_rule: [a-z].*
```

JSONå¡ćåijŔãĄőåőŽç¿l’ãĆŠpropertyãĄĺãĄŲãĄęèĺ■åőŽãĄŹãĆŃåät’åŘĹãĂĄæŤźèąÑãĆŠåŘńãĆĄãĄęèÍŸåĚěãĄŹãĆŃãĄŞãĄĺãĄğ
ãĆĺãČşãČĘãĆčãČĘãĆčãĆŠä¡£çŤĺãĄŹãĆŃãĄŞãĄĺãĄÑãĄğãĄ■ãĄ¿ãĄŹãĂĆ

`properties_json` ãĆĺãČşãČĘãĆčãČĘãĆčãĄŕãĂĄtemplateãĄő *bot* èęĄçť’ăãĄğãĄőJ-
SONå¡ćåijŔãĄőæČĚåăšåŘŰå¿ŮãĄńä¡£çŤĺãĄŹãĆŃãĆĆãĄõãĄğãĂĄãČđãČČãČąãČşãĆřãĄğä¡£çŤĺãĄŹãĆŃãĄŞãĄĺãĄŕæŐĺåěĺãA
`properties_json` ãĆĺãČşãČĘãĆčãČĘãĆčãĄğãĄŕãĂĄãĄİãĄőéĚ■äÿŃãĄńJ-
SONãČŢãĆąãĆd’ãČńãĆŠéĚ■ç¡őãĄŹãĆŃãĄŞãĄĺãĄğãĂĄãČŢãĆąãĆd’ãČńåŘ■ïijĹæŃąåijţå■ŘãĆŠéŹd’ãĄŔïijL’ãĆŠãĄİãĄõãA¿ãA

åřŽãĂĄpropertyãĄőåĂd’ãĄńãĄŕãĂĄJSONãČŢãĆąãĆd’ãČńãĄőåĘĚåőźãĄİãĄõãĆĆãĄõãĄğãĄŕãĄłãĄŔãĂĄJSONãČĞãČijãĆ£ãA

joiner_terminator

å£IJç■ŤæŰĞãĄőèłđåř¿åŔěç■L’ãĆŠèĞłåŃŢçŽĎãĄńäżŸäÿÕãĄŹãĆŃæŰĞå■ŮåĹŮãĆŠæŇĞåőŽãĄŮãA¿ãĄŹãĂĆ
èĺ■åőŽä¿ŃãĄńãĂĄâĂİãĄŞãĆŞãĄńãĄąãĄŕâĂİãĆŠæŇĞåőŽãĄŮãĄ§åät’åŘĹãĂĄ

- èĺ■åőŽä¿Ń

```
joiner_terminator: ãĂĆ
```

```
<category>
    <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ</pattern>
    <template>äżŁæŮěãĆĆåĚČæřŮãĄńèąÑãA■ãA¿ãĄŮãĆĞãĄĘ</template>
</category>
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕ
Output: äżŁæŮěãĆĆåĚČæřŮãĄńèąÑãA■ãA¿ãĄŮãĆĞãĄĘãĂĆ

åŕ¿èl’śAPIãĄőãČńãĆźãČİãČşãĆźãĄőå£IJç■ŤæŰĞïijŽresponseãĄőæŰĞæIJńãĄńèĞłåŃŢçŽĎãĄńäżŸäÿÕãĄŢãĆÑãĆÑåŔěçĆźãĂN
ïijĹâĂİ:âĂİãĄőå¿ÑãĆ■ãĄńä¡ŢãĆĆæŇĞåőŽãĄŮãĄłãĄĎãĄŞãĄĺãĄğãĂĄçĎąåŁźåŃŰãĄŹãĆŃãĄŞãĄĺãĄÑãĄğãA■ãA¿ãĄŹãĂĆï

```
joiner_terminator:
```

æIJłæŇĞåőŽãĄńãĄŹãĆŃãĄĺãĂĄå£IJç■ŤæŰĞãĄńåŔěçĆźãĄÑäżŸäÿÕãĄŢãĆÑãA¿ãĄŽãĆŞãĂĆ

Input: ãĄŞãĆŞãĄńãĄąãĄŕ
Output: äżŁæŮěãĆĆåĚČæřŮãĄńèąÑãA■ãA¿ãĄŮãĆĞãĄĘ

joiner_join_chars

joiner_join_charsïijĹçţŘåŘĹéŹd’åd’ŰæŰĞå■ŮïijL’ãĄŕãĂĄjoiner_terminator(æŰĞçţĆçńŕæŰĞå■Ů)ãĆŠèĞłåŃŢäżŸäÿÕãĄŹãĆŃé
joiner_join_charsæIJłæŇĞåőŽãĄőåät’åŘĹãĂĄ
å£IJç■ŤæŰĞãĄńâĂİäżŁæŮěãĆĆåĚČæřŮãĄńèąÑãA■ãA¿ãĄŮãĆĞãĄĘãĂĆâĂİãĂĄâĂİãĄĎãĄĎæřŮåĹĘãĄğãĄŹãA■ïijĄâĂİãĄł

âĂIJäżŁæŮěãĆĆåĚČærŮãĄńèąÑãĄ■ãĄ¿ãĄŮãĆĞãĄĘãĂĆãĂĆâĂİãĂĄâĂİãĄĐãĄĐærŮåĹĘãĄğãĄŹãĄ■ïijĄãĂĆâĂİãĄőãĆĹãĄ

joiner_join_charsãĆŠæŇĞåőŽãĄŮãĄęãĄŁãĄŔãĄÍãĂĄâĂİãĄİãĄĘãĄğãĄŹãĄ■!âĂİãĂĄâĂİãĄŞãĆŞãĄńãĄąãĄŕãĂĆâĂİãĄÍãĂĄ

- èÍ■åőŽä¿Ń

```
joiner_terminator: ãĂĆ
joiner_join_chars: .?!ãĂĆïij$ïijĄ
```

```
<category>
    <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ</pattern>
    <template>äżŁæŮěãĆĆåĚČærŮãĄńèąÑãĄ■ãĄ¿ãĄŮãĆĞãĄĘãĂĆ</template>
</category>
<category>
    <pattern>äżŁæŮěãĆĆãĄĐãĄĐåd'l'ærŮãĄğãĄŹãĄ■</pattern>
    <template>ãĄĐãĄĐærŮåĹĘãĄğãĄŹãĄ■ïijĄ</template>
</category>
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕ
Output: äżŁæŮěãĆĆåĚČærŮãĄńèąÑãĄ■ãĄ¿ãĄŮãĆĞãĄĘãĂĆ
Input: äżŁæŮěãĆĆãĄĐãĄĐåd'l'ærŮãĄğãĄŹãĄ■
Output: ãĄĐãĄĐærŮåĹĘãĄğãĄŹãĄ■ïijĄ

joiner_join_charsãĆŠæIJłæŇĞåőŽãĄńãĄŹãĆŃãĄÍãĂĄjoiner_terminatorãĄğæŇĞåőŽãĄŮãĄ§æŰĞå■ŮãĄŇå£ĚãĄŽçţŘåŘĹãĄŢã

```
joiner_terminator: ãĂĆ
joiner_join_chars:
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕ
Output: äżŁæŮěãĆĆåĚČærŮãĄńèąÑãĄ■ãĄ¿ãĄŮãĆĞãĄĘãĂĆãĂĆ
Input: äżŁæŮěãĆĆãĄĐãĄĐåd'l'ærŮãĄğãĄŹãĄ■
Output: ãĄĐãĄĐærŮåĹĘãĄğãĄŹãĄ■ïijĄãĂĆ

splitter_split_chars

åĘĚéČÍçŽĎãĄńæŰĞçńăåĹĘåL'šãĆŠèąÑãĄĘæŰĞå■ŮãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
æŇĞåőŽãĄŢãĆÑãĄ§æŰĞå■ŮåĹŮãĄÑæŰĞäÿ■ãĄńåŘńãĄ¿ãĆÑãĄęãĄĐãĆÑãĄÍãĂĄèd'ĞæŢřæŰĞãĄÍãĄŮãĄęæL'šãĄĐãĂĄres
splitter_split_charsãĄńâĂİãĂĆâĂİãĆŠæŇĞåőŽãĄŮãĄ§åăt'åŘĹãĂĄçŹžèl'śæŰĞãĄÑâĂİãĄŞãĆŞãĄńãĄąãĄŕãĂĆäżŁæŮěãĆĆãĄ
åĹĘåL'šåĞęçŘĘãĄŢãĆÑ âĂIJãĄŞãĆŞãĄńãĄąãĄŕâĂİãĄÍâĂİäżŁæŮěãĆĆãĄĐãĄĐåd'l'ærŮãĄğãĄŹãĄ■âĂİãĄő2æŰĞãĄńãĄŁãĆŁ

- èÍ■åőŽä¿Ń

```
joiner_terminator: ãĂĆ
splitter_split_chars: ãĂĆ
```

```
<category>
    <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ</pattern>
    <template>äżŁæŮěãĆĆåĚČærŮãĄńèąÑãĄ■ãĄ¿ãĄŮãĆĞãĄĘ</template>
</category>
<category>
    <pattern>äżŁæŮěãĆĆãĄĐãĄĐåd'l'ærŮãĄğãĄŹãĄ■</pattern>
```

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```
    <template>ãĄĐãĄĐæřŮåĹĘãĄğãĄŹãĄ■</template>
</category>
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕãĂĆäżŁæŮěãĆĆãĄĐãĄĐåď'l'æřŮãĄğãĄŹãĄ■ãĂĆ
Output: äżŁæŮěãĆĆåĚČæřŮãĄńèąŇãĄ■ãĄ¿ãĄŮãĆĞãĄĘãĂĆãĄĐãĄĐæřŮåĹĘãĄğãĄŹãĄ■ãĂĆ

splitter_split_charsãĆŠæIJłæŇĞåőŽãĄńãĄŹãĆŃãĄĺãĂąçŹžèl'śæŰĞãĄŇåĹĘåL'šãĄŢãĆŇãĄłãĄĐãĄ§ãĆĄãĂąâĂİãĄŞãĆŞãĄńã

```
splitter_split_chars:
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕãĂĆäżŁæŮěãĆĆãĄĐãĄĐåď'l'æřŮãĄğãĄŹãĄ■ãĂĆ
Output: ãĄŹãĄ£ãĄ¿ãĄŻãĆŞãĂąæĎŔåŚşãĄŇãĆŔãĄŃãĆŁãĄ¿ãĄŻãĆŞãĄğãĄŮãĄ§ãĂĆ

punctuation_chars

åĚěåŁŻæŰĞãĄőåŇžåĹĞãĆŁæŰĞå■ŮæL'śãĄĐãĆŠèąŇãĄĘæŰĞå■ŮãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆåŇžåĹĞãĆŁæŰĞå■ŮãĄŕãĆd
âĂIJãĄŞãĆŞãĄńãĄąãĄŕãĂĆâĂİãĄŁãĆĹãĄşâĂİãĄŞãĆŞãĄńãĄąãĄŕâĂİãĄĺãĄĐãĄĘåĚěåŁŻãĄŇãĄĆãĆŃåăť'åŘĹãĂĄpunctuatio

- èÍ■åőŽä¿Ń

```
punctuation_chars: ;'",!()[]ïijžâĂźâĂİïijżãĂĄãĂĆïijĄïijĹïijL'ãĂŇãĂ■
```

```
<category>
    <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ</pattern>
    <template>äżŁæŮěãĆĆåĚČæřŮãĄńèąŇãĄ■ãĄ¿ãĄŮãĆĞãĄĘ</template>
</category>
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕãĂĆ
Output: äżŁæŮěãĆĆåĚČæřŮãĄńèąŇãĄ■ãĄ¿ãĄŮãĆĞãĄĘãĂĆ
Input: ãĄŞãĆŞãĄńãĄąãĄŕ
Output: äżŁæŮěãĆĆåĚČæřŮãĄńèąŇãĄ■ãĄ¿ãĄŮãĆĞãĄĘãĂĆ

punctuation_charsãĆŠæIJłæŇĞåőŽãĄńãĄŹãĆŃãĄĺãĂąâĂİãĂĆâĂİãĆĆãĆđãĆČãĆãĆąår¿èśąãĄĺãĄłãĆŃãĄ§ãĆĄãĂąâĂİãĄŞãĆŞã

```
punctuation_chars:
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕ
Output: äżŁæŮěãĆĆåĚČæřŮãĄńèąŇãĄ■ãĄ¿ãĄŮãĆĞãĄĘãĂĆ
Input: ãĄŞãĆŞãĄńãĄąãĄŕãĂĆ
Output: ãĄŹãĄ£ãĄ¿ãĄŻãĆŞãĂąæĎŔåŚşãĄŇãĆŔãĄŃãĆŁãĄ¿ãĄŻãĆŞãĄğãĄŮãĄ§ãĂĆ

concatenation_rule

templateèèęĄçt'ăãĄőåśŢéŰŃåĞęçŘĘãĄğãĄŕãĂĄå■ŘèęĄçt'ăæŕŐãĄőçţŘæđIJæŰĞå■ŮåĹŮãĆŠçţŘåŘĹãĄŮãĄęå£IJç■ŤæŰĞãĆŠç

èŃśæŰĞãĄğãĄĆãĆŃãĄřäÿĂå¿ŃãĄńå■Ÿè‡đéŰŞãĄńçľžçŹ¡ãĆŠæŃ£åĚěãĄŮãĄęçţŘåŘĹãĄŮãĄ¿ãĄŹãĄŃãĂĄæŮëèŃśæůůåŘĹæ

```
before_concatenation_rule: .*[ -~] ␣
↪(åL'■æŰĞå■ŮåĹŮãĄőè‡đåř¿ãĄŃå■Łèğ$èŃśæŢřå■ŮãĄ¿ãĄ$ãĄŕèÍŸåŔů)
after_concatenation_rule: [ -~].* ␣
↪(å¿ŇæŰĞå■ŮåĹŮãĄőåĚĹéă■ãĄŃå■Łèğ$èŃśæŢřå■ŮãĄ¿ãĄ$ãĄŕèÍŸåŔů)
```

- èÍ■åőŽä¿ŃãĂĂïijĹåL'■æŰĞå■ŮåĹŮãĄőè‡đåř¿ãĄŃå■Łèğ$èŃśå■ŮãĄğãĂĄå¿ŇæŰĞå■ŮåĹŮãĄőåĚĹéă■ãĄŃå■Łèğ$èŃśå■

```
before_concatenation_rule: .*[a-z]
after_concatenation_rule: [a-z].*
```

```
<category>
    <pattern>* and *</pattern>
    <template><star /><star index="2" /></template>
</category>
```

Input: sugar and milk
Output: sugar milkãĂĆ
Input: sugar and ãČ§ãČńãĆŕ
Output: sugarãČ§ãČńãĆŕãĂĆ
Input: çăĆçşŰ and milk
Output: çăĆçşŰmilkãĂĆ
Input: çăĆçşŰ and ãČ§ãČńãĆŕ
Output: çăĆçşŰãČ§ãČńãĆŕ

åĚÍèğ$èŃśå■ŮãĆŠåŘńãĆĄãĄęåŕ¿å£IJãĄŹãĆŃåăť'åŘĹãĄőæŇĞåőŽãĄŕãĂĄäžëäÿŃãĄőæğŸãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ(æ■čèęŔèąĺ

```
before_concatenation_rule: .*[a-zïijąïijž]
after_concatenation_rule: [a-zïijąïijž].*
```

èŃśæŢřå■ŮãĄĺéĂŽèšĺèÍŸåŔůãĄőéŰŞãĄńçľžçŹ¡ãĆŠæŃ£åĚěãĄŹãĆŃåăť'åŘĹãĄńãĄŕãĂĄäžëäÿŃãĄőèĺ■åőŽãĆŠèąŇãĄĐãĄ¿ãĄ

```
before_concatenation_rule: .*[a-z0-9]
after_concatenation_rule: [a-z0-9$Âě].*
```

8.5.2 ãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹåőŽç¿ľãČŢãĆąãĆd'ãČń

äžëäÿŃãĄőãĆĺãČşãČĘãĆčãČĘãĆčãĄğæŇĞåőŽãĄŹãĆŃãČŢãĆąãĆd'ãČńãĄŕãĂĄåĹľçŤĺãĄŹãĆŃãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹ
yamlå¡ćåijŔãĄőåăť'åŘĹãĂĄèÍŸåŔůãĄŃæĐŔåŠşãĆŠæŇąãĄd'åăť'åŘĹãĄŃãĄĆãĆŃãĄ§ãĆąãĂĄèÍŸåŔůãĆŠåŘńãĆĂæŰĞå■ŮåĹ
âĂIJâĂŹâĂİ ãĄğåŽšãĆĂå£ĚèęĄãĄŃãĄĆãĆŁãĄ¿ãĄŹãĂĆ

- nlu_servers : åĹľçŤĺãĄŹãĆŃNLUãĆţãČijãČŘãĄńéŰćãĄŹãĆŃãĆćãĆŕãĆżãĆźæČĚåăśãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ
- bot_names : åĹľçŤĺãĄŹãĆŃåĚňéŰŃBotãĄńéŰćãĄŹãĆŃãĆćãĆŕãĆżãĆźæČĚåăśãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ
- rest_templates : åĹľçŤĺãĄŹãĆŃRESTãĆţãČijãČŘãĄńéŰćãĄŹãĆŃãĆćãĆŕãĆżãĆźæČĚåăśãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ

nlu_servers

`nlu_servers` ãĆĺãČşãČĘãĆčãČĘãĆčãĄğãĄŕãĂĄæňąãĄőïijŞãĄd'ãĄőåőŽç¿ľãĆŠèąŇãĄĐãĄ¿ãĄŹãĂĆ

- *sraix* èęĄçť'ãäĄğä¡£çŤĺãĄŹãĆŃNLUãĆţãČijãČŘãĄőãĆćãĆŕãĆżãĆźåĚĹæČĚåăśãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ

- ãČđãČČãČĄåĞęçŘĘãĄńä¡£çŤĺãĄŹãĆŃNLUãĆţãČijãČŘãĄõãĆćãĆŕãĆżãĆźåĚĹæČĚåăśãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ
- ãČđãČČãČĄåĞęçŘĘæŹĆãĄőNLUãĆţãČijãČŘæŕŐãĄõéĂŽä£qæŹĆéŰŞãĄõæIJĂåd'ğåĂd'ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ

âĂŸsraixâĂŹèęAçt'ăãĄğä¡£çŤĺãĄŹãĆŃNLUãĆţãČijãČŘæČĚåăśãĄńãĄŕãĂĄãĆĺãĆd'ãČłãĆćãĆźåŘ■æŕŐãĄńãĂĄãĆćãĆŕãĆżãĆźå
nlu ãĄğãĆĺãĆd'ãČłãĆćãĆźåŘ■ãĆŠæŇĞåőŽãĄŹãĆŃãĄŞãĄĺãĄğåĹl'çŤĺãĄğãĄ■ãĄ¿ãĄŹãĂĆ

åřŽãĂĄãĆćãĆŕãĆżãĆźåĚĹURLãĄõæŇĞåőŽãĄŕå£ĚéäĹãĄğãĂĄãĆĺãĆd'ãČłãĆćãĆźåŘ■ãĄŕãĂĄèŃśå■ŮïijŽå■ŁèğŠåd'ğæŰĞå■Ůã

äžěäÿŃãĄőä¿ŃãĄŕãĂĄ2ãĄd'ãĄõãĆĺãĆd'ãČłãĆćãĆźåŘ■ãĄõåőŽç¿l'ãĆŠèąŇãĄčãĄ§ä¿ŃãĄğãĄŹãĂĆ1ãĄd'çŻõãĄŕURLãĄńAPIãĆ

```
servers:
  ãĆĺãĆd'ãČłãĆćãĆźåŘ■_1:
    url: http://localhost:5200/run
  ãĆĺãĆd'ãČłãĆćãĆźåŘ■_2:
    url: http://localhost:3000/run
    apikey: test_key
```

ãČđãČČãČĄåĞęçŘĘãĄńä¡£çŤĺãĄŹãĆŃNLUãĆţãČijãČŘæČĚåăśãĄńãĄd'ãĄĎãĄęãĆĆãĂĄãĆćãĆŕãĆżãĆźåĚĹURL(ãĆĺãČşãČL'ã
ïijĹnameæŇĞåőŽãĆŠéŹd'ãĄ■ãĂĄãĆćãĆŕãĆżãĆźåĚĹURLãĄõæŇĞåőŽãĄŕå£ĚéäĹãĄğãĄŹãĂĆïijL'

èd'ĞæŢřãĄőNLUãĆţãČijãČŘãĆŠåĹl'çŤĺãĄŹãĆŃåăt'åŘĹãĄŇãĄĆãĆŃãĄ§ãĆĄãĂAyamlèÍŸè£řãĄńãĄŕãČłãĆźãČĹïijĹèąŇéă■èÍŸ
âĂŸïijL'æŇĞåőŽãĆŠèąŇãĄĎãĂĄèÍŸè£řéäĘåžŔãĄńå¿ŞãĄčãĄęãĂĄãČđãČČãČĄåĞęçŘĘæŹĆãĄőNLUãĆţãČijãČŘéĂŽä£qãĆŠèą
ïijĹïijŚãĄd'ãĄőNLUãĆţãČijãČŘãĄõãĄ£ãĆŠåĹl'çŤĺãĄŹãĆŃåăt'åŘĹãĄŕãĂĄèąŇéă■èÍŸåŕůïijŽâĂŹ-
âĂŸãĄőæŇĞåőŽãĄŕçIJĄçŢěãĄŇåŔŕèČ¡ãĄğãĄŹãĂĆïijL'

åřŽãĂĄNLUãČđãČČãČĄãČşãĆŕãĄğãĄŕãĂĄåŘŇäÿĂãĄőURLãĄńår¿ãĄŹãĆŃéĞ■èd'ĞéĂŽä£qãĆŠæŁŚæ■ćãĄŹãĆŃãĄ§ãĆĄãĂ

äžěäÿŃãĄőä¿ŃãĄŕãĂĄ1ãĄd'çŻõãĄŕURLæŇĞåőŽãĄõAPIãĆ■ãČijèĺ■åőŽãĄłãĄŮãĂĄ2ãĄd'çŻõãĄŕURLæŇĞåőŽãĄĺãĄĺãĆĆãĄ

```
nlu:
  - url: http://localhost:5201/run
  - url: http://localhost:3000/run
    apikey: test_key
  - name: ãĆĺãĆd'ãČłãĆćãĆźåŘ■_1
```

NLUãĆţãČijãČŘæŕŐãĄõéĂŽä£qæŹĆéŰŞãĄõæIJĂåd'ğåĂd'ãĄõæŇĞåőŽãĄŕçğŠå■Ÿä¡■ãĄğãĂĄåŘĎãĆţãČijãČŘãĄńåĚśéĂŽãĄõ

åřŽãĂĄæIJńæŇĞåőŽãĄŕNLUãĆŠåĹl'çŤĺãĄŮãĄ§ãČđãČČãČĄåĞęçŘĘãĆŠèąŇãĄĘåăt'åŘĹãĄńæIJL'åŁźãĄğãĂĄçIJĄçŢěæŹĆãĄ

```
timeout: 1
```

ãČđãČČãČĄåĞęçŘĘãĄńä¡£çŤĺãĄŹãĆŃNLUãĆţãČijãČŘæČĚåăśãĆŠæIJńãČŢãĆąãĆd'ãČńãĄğæŇĞåőŽãĄŹãĆŃåăt'åŘĹãĄńãĄŕã

ãĄŞãĄõæŇĞåőŽãĄŇãĄłãĄĎåăt'åŘĹãĆĎãĂĄæIJńãČŢãĆąãĆd'ãČńãĄńãČđãČČãČĄåĞęçŘĘãĄńä¡£çŤĺãĄŹãĆŃNLUãĆţãČijãČŘ

ïijĹãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşåőŽç¿ľãĄğãĆČNLUãĆţãČijãČŘãĄőæČĚåăśãĄŇæŇĞåőŽãĄŢãĆŇãĄęãĄĎãĄłãĄĎåăt'

```
brain:
  nlu:
    use_file: true
```

bot_names

bot_names ãĆĺãČşãČĘãĆčãČĘãĆčãĄğãĄŕãĂĄ*sraix*
èęAçt'ăăĄğä¡£çŤĺãĄŹãĆŃåĚňéŰŃBotãĄõãĆćãĆŕãĆżãĆźåĚĹæČĚåăśãĄĺãĄŮãĄęãĂĄãĆĺãĆd'ãČłãĆćãĆźåŘ■æŕŐãĄńãĂĄäÿżãĄ
sraixèęAçt'ăăĄğãĄŕåśđæĂğïijŽ botName
ãĄğãĆĺãĆd'ãČłãĆćãĆźåŘ■ãĆŠæŇĞåőŽãĄŹãĆŃãĄŞãĄĺãĄğåĚňéŰŃBotãĆŠåĹl'çŤĺãĄğãĄ■ãĄ¿ãĄŹãĂĆ

(æŇĞåőŽãĄŹãĆŃåĂd'ãĄŕãĂĄBotçŤ§æĹŘæŹĆãĄńçćžåőŽãĄŮãĄ¿ãĄŹãĄõãĄğãĂĄåĚňéŰŃBotãĄõæŔŘä¿ŻèĂĚãĄńçćžèł■ãĄŹ

åřŽãĂĄãĆćãĆŕãĆżãĆźåĚĹURLãĄõæŇĞåőŽãĄŕå£ĚéăĹãĄğãĂĄãĆĺãĆd'ãČłãĆćãĆźåŘ■ãĄŕãĂĄèŃśå■ŮïijŽå■ŁèğŠåd'ğæŰĞå■Ůã

äžěäÿŃãĄõä¿ŃãĄŕãĂĄ2ãĄd'ãĄõãĆĺãĆd'ãČłãĆćãĆźåŘ■ãĄõèĺ■åőŽãĆŠèąŇãĄčãĄ§ä¿ŃãĄğãĄŹãĂĆ1ãĄd'çŻõãĄŕURLãĄńAPIãĆ

```
bot:
  ãĆĺãĆd'ãČłãĆćãĆźåŘ■_1:
    url: http://localhost:5400/bots/botId_1/ask
  ãĆĺãĆd'ãČłãĆćãĆźåŘ■_2:
    url: http://localhost:5401/bots/botId_1/ask
    apikey: test_key
```

åĚňéŰŃBotãĄĺãĄõéĂŽä£ąãĄğãĄŕãĂĄåŘĎçĺõãĄõãČŚãČl'ãČąãČijãĆ£ãĄŇæŇĞåőŽãĄğãĄ■ãĆŃãĄ§ãĆĄãĂĄãĆĺãĆd'ãČłãĆćãĆ
åřŽãĂĄéĂŽä£ąæŹĆãĄńä¡£çŤĺãĄŢãĆŃãĆŃãČŚãČl'ãČąãČijãĆ£ãĄőåĂd'ãĄńãĄŕãĂĄ*sraix*
èęAçt'ăăĄğãĄőå■ŘèęAçt'ăæŇĞåőŽãĄőåĘĚåőźãĄŇåĎłåĚĹãĄŮãĄęèĺ■åőŽãĄŢãĆŃãĄ¿ãĄŹãĂĆ

```
bot:
  ãĆĺãĆd'ãČłãĆćãĆźåŘ■:
    url: http://localhost:5401/bots/botId_1/ask
    apikey: test_key
    metadata: Send Data
    locale: ja-JP
    time: 2018-07-01T12:18:45+09:00
    topic: test
    deleteVariable: false
    config: '{"loglevel": "info"}'
```

rest_templates

rest_templates ãĆĺãČşãČĘãĆčãČĘãĆčãĄğãĄŕãĂĄ*sraix*
èęAçt'ăăĄğèąŇãĄĘæśŐçŤĺRESTéĂŽä£ąãĄğä¡£çŤĺãĄŹãĆŃéŻŽå¡ćæČĚåăśãĆŠãČĘãČşãČŮãČňãČijãČĹåŘ■æŕŐãĄńèĺ■åőŽãĄŮã
âĂŸsraixâĂŹèęAçt'ăăĄğãĄŕåśđæĂğïijŽ template
ãĄğãČĘãČşãČŮãČňãČijãČĹåŘ■ãĆŠæŇĞåőŽãĄŹãĆŃãĄŞãĄĺãĄğæśŐçŤĺRESTéĂŽä£ąãĆŠèąŇãĄĎãĄ¿ãĄŹãĂĆ
åřŽãĂĄãĆćãĆŕãĆżãĆźåĚĹæČĚåăśãĄğãĄĆãĆŃ âĂŸhostâĂŹ
ãĄõæŇĞåőŽãĄŕå£ĚéăĹãĄğãĂĄãČĘãČşãČŮãČňãČijãČĹåŘ■ãĄŕãĂĄèŃśå■ŮïijŽå■ŁèğŠåd'ğæŰĞå■ŮãĂĄæŢřå■ŮãČżèĺŸåŕůïijŽ

èĺ■åőŽéăĚçŻõãĄĺãĄŮãĄęãĄŕãĂĄæśŐçŤĺRESTéĂŽä£ąãĄğæŇĞåőŽãĄğãĄ■ãĆŃåĚĺãČŚãČl'ãČąãČijãĆ£ãĄõæŇĞåőŽãĄŇåŔŕèČ
èęAçt'ăăĄğãĄőå■ŘèęAçt'ăæŇĞåőŽãĄőåĘĚåőźãĄŇåĎłåĚĹãĄŮãĄęèĺ■åőŽãĄŢãĆŃãĄ¿ãĄŹãĂĆ

äžěäÿŇãĄőä¿ŇãĄŕãĂĄ2ãĄd'ãĄőãČęãCşãČŮãČňãCijãČĹåŘ■ãĄőèĺ■åőŽãĆŠèąŇãĄčãĄ§ä¿ŇãĄğãĄŹãĂĆ1ãĄd'çŻőãĄŕå£ĚéăĹåĉ

```
rest:
  ãČĘãČşãČŮãČňãCijãČĹåŘ■_1:
    host: 'http://localhost:5300/rest'
  ãČĘãČşãČŮãČňãCijãČĹåŘ■_2:
    host: 'http://localhost:5300/rest'
    method: POST
    query:  '"item":"1234"'
    header: '"Content-Type": "applicaton/json"'
    body: '{"key": "Send Data"}'
```

8.5.3 å■ŸèłđãČłãĆźãČĹãČŢãĆąãĆd'ãČń

äžěäÿŇãĄőãĆĺãČşãČĘãĆčãČĘãĆčãĄğæŇĞåőŽãĄŹãĆŇãČŢãĆąãĆd'ãČńãĄğãĄŕãĂĄåĞęçŘĘår¿èśąãĄĺãĄłãĆŃå■ŸèłđãČżæŰĞå

- sets ïijŽ *set* èęAçt'ããĄğä¡£çŤĺãĄŹãĆŇãČđãĆČãČĄåĞęçŘĘår¿èśąãĄőå■ŸèłđãČłãĆźãČĹãĆŠåőŽç¿l'ãĂĆ

```
sets
ãĆĺãČşãČĘãĆčãČĘãĆčãĄğãĄŕãĂĄsetèęAçt'ããĄğãĄőæČĚåăśåŔĆçĚğãĄŇãČŢãĆąãĆd'ãČńåŘ■ïijĹæŃąåijţå■ŘãĆŠéŹd'ãĄŔïijL'ãA

è■ŸåĹěåŘ■ãĄŕãĂĄãČŢãĆąãĆd'ãČńåŘ■ïijĹæŃąåijţå■ŘãĆŠéŹd'ãĄŔïijL'ãĆŠãĂĄèŃśå■ŮïijŽå■ŁèğŠåd'ğæŰĞå■ŮãĂĄæŢřå■ŮãČ

ãČđãČČãČĄåĞęçŘĘãĆĆãĂĄèŃśå■ŮïijŽå■ŁèğŠåd'ğæŰĞå■ŮãĂĄæŢřå■ŮãČżèÍŸåŔůïijŽå■ŁèğŠãĂĄãĆńãĆ£ãĆńãČŁïijŽåĚíèğŠ
star
èęAçt'ããĄğåŔŰå¿ŮãĄŢãĆŇãĆŃåĂd'ãĄŕãČŢãĆąãĆd'ãČńãĄńèÍŸè£řãĄŮãĄ§ãĆĆãĄőãĄńãĄłãĆŁãA¿ãĄŹãĂĆ

åřŽãĂĄæŮěæIJňèłđãĄőåät'åŘĹãĂĄãČđãČČãČĄåĞęçŘĘæŹĆãĄńèąŇãĄĘå■ŸèłđåĹĘåL'šãĄőçţŘæđIJãĄńãĆĹãĄčãĄęäÿĂèĞt'ãA
äžěäÿŇãĄőä¿ŇãĄŕãĂĄéČ¡éĄŞåžIJçIJŇåŘ■ãĆŠåĹŮèÍŸãĄŮãĄ§prefecture.txtãĄőä¿ŇãĄğãĄŹãĂĆ

```
æİśäžňéČ¡
æİśäžň
çěđåěĹåůİçIJŇ
çěđåěĹåůİ
åd'ğéŸłåžIJ
åd'ğéŸł
 ïijŽ
```

èŃśæŰĞãĄőåät'åŘĹãĄğãĆĆãĂĄèd'ĞæŢřå■ŸèłđãĄŇãĆL'ãĄłãĆŃæŰĞå■ŮåĹŮãĆŠæŇĞåőŽãĄŹãĆŇãĄŞãĄĺãĄŇåŔŕèČ¡ãĄğãĂ
åřŽãĂĄèŃśå■ŮãČłãĆźãČĹãĄĺæŮěæIJňèłđãČłãĆźãČĹãĄĺãĄğãĄŕåĞęçŘĘæŰźåijŔãĄŇçŢřãĄłãĆŃãĄ§ãĆĄãĂĄïijŠãĄd'ãĄőãČŢã

8.5.4 æ■čèęŔèąÍçŔ¿ãČłãĆźãČĹãČŢãĆąãĆd'ãČń

äžěäÿŇãĄőãĆĺãČşãČĘãĆčãČĘãĆčãĄğæŇĞåőŽãĄŹãĆŇãČŢãĆąãĆd'ãČńãĄğãĄŕãĂĄ âĂŹæ■čèęŔèąÍçŔ¿åŘ■ :
æ■čèęŔèąÍçŔ¿æŰĞå■ŮåĹŮâĂŹ ãĄőå¡ćåijŔãĄğèÍŸè£řãĄŮãĄ¿ãĄŹãĂĆ

- regex_templates ïijŽ *regex* èęAçt'ããĄőtemplateæŇĞåőŽãĄğä¡£çŤĺãĄŹãĆŇæ■čèęŔèąÍçŔ¿ãČłãĆźãČĹãĆŠåőŽç¿l'ãĂĆ

```
regex_templates
ãĆĺãČşãČĘãĆčãČĘãĆčãĄğãĄŕãĂĄregexèęAçt'ããĄğèąŇãĄĘãČđãČČãČĄåĞęçŘĘãĄńä¡£çŤĺãĄŹãĆŇæ■čèęŔèąÍçŔ¿æŰĞå■ŮåĹŮ

regexèęAçt'ãåĄt'ãĄğãĄŕãĂĄtemplateåśđæĂğãĄğæ■čèęŔèąÍçŔ¿åŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆåřŽãĂĄæ■čèęŔèąÍçŔ¿ãĄőèÍŸ
```
```

åřŽãĂĄæ■čèęŔèąĺçŔ¿åŘ■ãĄŕãĂĄĂąèŃśå■ŮïijŽå■ŁèğŠåď˙ğæŰĞå■ŮãĂĄæŢřå■ŮãČżèĺŸåŔůïijŽå■ŁèğŠãĂĄãĆńãĆ£ãĆńãČŁïijŽåĚ
èĺŸè£řä¿ŃãĄŕãĂĄäżěäÿŃãĄőæğŸãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

```
konnichiwa : ãĄŞãĆŞãĄńãĄą[ãĄŕ|ãĆŔ]
tomorrow : æŸŐæůě|ãĄĆãĄŹ|ãĄĆãĄůãĄ§
today : äżŁæůě|ãĄ■ãĆĞãĄę
  ïijŽ
```

8.5.5 åď˙L'æŔŻè¿đæŻÿãČŢãĆąãĆď˙ãČń

äżěäÿŃãĄőãĆĺãČşãČęãĆčãČęãĆčãĄąğæŇĞåőŽãĄŹãĆŃãČŢãĆąãĆď˙ãČńãĄŕãĂĄåď˙L'æŔŻçŤĺãĄőãČęãČijãČŰãČńãĄőãČłãĆźãČĹãĆŠåőŽç¿l'ãĂĆ
åď˙L'æŔŻåŕ¿èśąæŰĞå■ŮåĹŮãĄĺåď˙L'æŔŻå¿ŇæŰĞå■ŮåĹŮãĄőéŰćä£ĆãĆŠåĹŮèĺŸãĄŮãĄ¿ãĄŹãĂĆ

- maps ïijŽ *map* èęĄçť˙ăçŤĺãĄőåď˙L'æŔŻãČęãČijãČŰãČńãĄőãČłãĆźãČĹãĆŠåőŽç¿l'ãĂĆ
- normal ïijŽ *normalize* èęĄçť˙ăçŤĺãĄőåď˙L'æŔŻãČęãČijãČŰãČńãĄőãČłãĆźãČĹãĆŠåőŽç¿l'ãĂĆ
- denormal ïijŽ *denormalize* èęĄçť˙ăçŤĺãĄőåď˙L'æŔŻãČęãČijãČŰãČńãĄőãČłãĆźãČĹãĆŠåőŽç¿l'ãĂĆ
- gender ïijŽ *gender* èęĄçť˙ăçŤĺãĄőåď˙L'æŔŻãČęãČijãČŰãČńãĄőãČłãĆźãČĹãĆŠåőŽç¿l'ãĂĆ
- person ïijŽ *person* èęĄçť˙ăçŤĺãĄőåď˙L'æŔŻãČęãČijãČŰãČńãĄőãČłãĆźãČĹãĆŠåőŽç¿l'ãĂĆ
- person2 ïijŽ *person2* èęĄçť˙ăçŤĺãĄőåď˙L'æŔŻãČęãČijãČŰãČńãĄőãČłãĆźãČĹãĆŠåőŽç¿l'ãĂĆ

maps

maps
ãĆĺãČşãČęãĆčãČęãĆčãĄąãĄŕãĂĄmapèęĄçť˙ãäĄőæČĚåăśåŔĆçĚğãĆŠãČŢãĆąãĆď˙ãČńåŘ■ïijĹæŃąåijţå■ŘãĆŠéŹď˙ãĄŔïijL'ãĄğè

ãČŢãĆąãĆď˙ãČńåŘ■ïijĹæŃąåijţå■ŘãĆŠéŹď˙ãĄŔïijL'ãĄŕãĂĄèŃśå■ŮïijŽå■ŁèğŠåď˙ğæŰĞå■ŮãĂĄæŢřå■ŮãČżèĺŸåŔůïijŽå■ŁèğŠã
ãČŢãĆąãĆď˙ãČńæŕŐãĄőèĺŸè£řãĄŕãĂĄâĂŹåď˙L'æŔŻåŕ¿èśąæŰĞå■ŮåĹŮ: åď˙L'æŔŻå¿ŇæŰĞå■ŮåĹŮâĂŹ
ãĄőå¡ćåijŔãĄğåĹŮèĺŸãĄŮãĄ¿ãĄŹãĂĆ

åď˙L'æŔŻåŕ¿èśąæŰĞå■ŮåĹŮãĄőäÿĂèĞť˙åĹď˙åőŽãĄŕãĂĄèŃśå■ŮïijŽå■ŁèğŠåď˙ğæŰĞå■ŮãĂĄæŢřå■ŮãČżèĺŸåŔůïijŽå■ŁèğŠãĂ
åď˙L'æŔŻçţŘæđIJãĄńãĄŕæŇĞåőŽãĄŢãĆŇãĄ§åď˙L'æŔŻå¿ŇæŰĞå■ŮåĹŮãĄŃèĺ■åőŽãĄŢãĆŇãĄ¿ãĄŹãĂĆ

äżěäÿŃãĄőä¿ŃãĄŕãĂĄéČ¡éĄŞåžIJçIJŃãĄĺçIJŃåžĄæL'ĂåIJĺåIJřãĄőéŰćä£ĆãĆŠåĹŮèĺŸãĄŮãĄ§prefectural_office.txtãĄőä¿ŃãĄ

```
æİśäžňéČ¡:æİśäžň
æİśäžň:æİśäžň
çěđåěĹåůİçIJŃ:æĺłæţIJåÿĆ
çěđåěĹåůİ:æĺłæţIJåÿĆ
åd'ğéŸłåžIJïijŽåd'ğéŸłåÿĆ
åd'ğéŸłïijŽåd'ğéŸłåÿĆ
 ïijŽ
```

normal

normal
ãĆĺãČşãČęãĆčãČęãĆčãĄąãĄŕãĂĄâĂŹâĂİåď˙L'æŔŻåŕ¿èśąæŰĞå■ŮåĹŮâĂİ,âĂİåď˙L'æŔŻå¿ŇæŰĞå■ŮåĹŮâĂİâĂŹ
ãĄőå¡ćåijŔãĆŠåĹŮèĺŸãĄŹãĆŃãĄŞãĄĺãĄąãĂĄæŰĞå■ŮåĹŮåĘĚãĄőèĺŸåŮç■L'ãĆŠçŃňçńŃãĄŮãĄ§å■ŸèłđãĄńåď˙L'æŔŻãĄŮã
èŃśå■ŮãĄőåăť˙åŘĹãĂĄâĂİåď˙L'æŔŻåŕ¿èśąæŰĞå■ŮåĹŮâĂİãĄő1æŰĞå■ŮçŽőãĄŇâĂŹ
âĂŸ(çl'žçŹ¡)ãĄąãĄłãĄĎåăť˙åŘĹãĂĄèĺŸåŮůãĄőåď˙L'æŔŻãĆŠåL'■æŔŘãĄĺãĄŮãĄęãĂĄåŕ¿èśąæŰĞå■ŮåĹŮåĘĚãĄąäÿĂèĞť˙ãĄŹ

åŕ¿ãĄŮãĄęãĂĄ1æŰĞå■ŮçŻőãĄŇâĂŹ
âĂŸ(çľžçŹ¡)ãĄőåăť åŘĹãĄńãĄŕãĂĄå■Ÿèłđã ĆŠå■Ÿä¡■ãĄĺãĄŮãĄ§åď L'æŔŻãĆŠèąŇãĄĎãĄ¿ãĄŹ(å■Ÿèłđç¡őæŔŻ)ãĂĆ

èŃśæŰĞãĄńåŕ¿ãĄŹãĆŃnormalizeãĄğãĄőåď L'æŔŻåĞęçŘĘãĄŕãĂĄæŰĞå■Ůåď L'æŔŻãĂĄå■Ÿèłđåď L'æŔŻãĄőéãĘãĄğèąŇãĄĎ
2ãĄď ãĄőåď L'æŔŻãĆŠçţĎãĄ£åŘĹãĆŔãĄŻãĄ§ä¿ŃãĄĺãĄŮãĄęãĂĄâĂİ.âĂİãĆŠâĂİdotâĂİãĂĄâĂİ
MrâĂİãĆŠâĂİmisterâĂİãĄğæŇĞåőŽãĄŹãĆŃãĄŞãĄĺãĄğãĂĄâĂİMr.âĂİãĆŠâĂİmister
dotâĂİãĄńåď L'æŔŻãĄŹãĆŃãĄŞãĄĺãĆĆãĄğãĄ■ãĄ¿ãĄŹãĂĆ
åřŽãĂĄæŮěæIJňèłđãĄőåăť åŘĹãĂĄå■Ÿèłđã ĆŠå■Ÿä¡■ãĄĺãĄŮãĄęåď L'æŔŻãĆŠèąŇãĄĎãĄ¿ãĄŹãĂĆ

```
".","dot"
"/","slash"
":","colon"
"*","_"
" Mr","mister"
" can t","can not"
```

denormal

`normal` ãĆĺãČşãČĘãĆčãČĘãĆčãĄğãĄőåď L'æŔŻãĄĺåŕ¿ãĆŠãĄłãĄŹãĂĄ`denormal`
ãĆĺãČşãČĘãĆčãČĘãĆčãĄğãĆĆãĂĄâĂŹâĂİåď L'æŔŻåŕ¿èśąæŰĞå■ŮåĹŮâĂİ,âĂİåď L'æŔŻå¿ŇæŰĞå■ŮåĹŮâĂİâĂŹ
ãĄőå¡ćåijŘãĆŠåĹŮèĺŸãĄŮãĂĄå■Ÿèłđã ĄŃãĆĽ'èĺŸåŘůç■L'ãĄőæŰĞå■ŮåĹŮãĄńæĹżãĄŮãĄ¿ãĄŹãĂĆ

èŃśå■ŮãĄőåăť åŘĹãĂĄâĂİåď L'æŔŻåŕ¿èśąæŰĞå■ŮåĹŮâĂİãĄŕå■Ÿèłđã ĄğãĄĆãĆŁãĂĄâĂİåď L'æŔŻå¿ŇæŰĞå■ŮåĹŮâĂİãĄńã
âĂŸ(çľžçŹ¡)ãĄőèęĄåŘęãĆŠåŘńãĆĄãĄęæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆçľžçŹ¡ãĄŇçĎąãĄĎåăť åŘĹãĄńãĄŕãĂĄåĽ■å¿ŇãĄőæŰĞå■Ů
normalizeãĄőéĂĘãĄőä¿ŃãĄĺãĄŮãĄęãĂĄâĂİmister dotâĂİãĆŠâĂİ
Mr.âĂİãĄńæĹżãĄŹåăť åŘĹãĂĄåĹęãĄőæŇĞåőŽæŰźæşŢãĄĺãĄŮãĄęãĂĄâĂİdotâĂİãĆŠâĂİ.âĂİãĂĄâĂİmisterâĂİãĆŠâĂİ
MrâĂİãĄő2ãĄď ãĄńåĹĘãĄŚãĄęæŇĞåőŽãĄŹãĆŃãĄŞãĄĺãĆĆãĄğãĄ■ãĄ¿ãĄŹãĂĆ

```
"dot","."
"slash","/"
"colon",":"
"_","*"
"mister dot"," Mr."
"can not"," can't "
```

gender,person,person2

`gender`ãĂĄ`person`ãĂĄ`person2`
ãĄőåŘĎãĆĺãČşãČĘãĆčãČĘãĆčãĄŕãĂĄå■Ÿèłđå■Ÿä¡■ãĄğåď L'æŔŻãĆŠèąŇãĄĘãĆĆãĄõãĄğãĂĄâĂŹâĂİåď L'æŔŻåŕ¿èśąæŰĞå■
ãĄőå¡ćåijŘãĆŠåĹŮèĺŸãĄŮãĄ¿ãĄŹãĂĆ

åď L'æŔŻåŕ¿èśąæŰĞå■ŮåĹŮãĂĄåď L'æŔŻå¿ŇæŰĞå■ŮåĹŮãĄńçľžçŹ¡ãĆŠåŘńãĆĂèď ĞæŢřå■Ÿèłđã ĄőæŰĞå■ŮåĹŮãĆŠæŇĞåő

åď L'æŔŻåŕ¿èśąæŰĞå■ŮåĹŮãĄőäÿĂèĞt'åĹď åőŽãĄŕãĂĄèŃśå■ŮïijŽå■ŁèğŠåď ğæŰĞå■ŮãĂĄæŢřå■ŮãČżèĺŸåŘůïijŽå■ŁèğŠãĂ
åď L'æŔŻçţŘædIJãĄńãĄŕæŇĞåőŽãĄŢãĆŇãĄ§åĂď ãĄŃèĺ■åőŽãĄŢãĆŇãĄ¿ãĄŹãĂĆ

ä¿ŃãĄĺãĄŮãĄęãĂĄgenderãĄğãĄŕäżěäÿŃãĄőæğŸãĄńåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ

```
"he","she"
"his","her"
"him","her"
```

(continues on next page)

(continued from previous page)

```
"her","him"
"she","he"
"ãĄŃãĆŇ","å¡ijåěş"
"ãĄŃãĄőãĄŸãĆĞ","å¡ij"
"ãĄŃãĆŇãĄŮ","å¡ijåěş"
"å¡ij","å¡ijåěş"
"å¡ijåěş","å¡ij"
"å¡ijæřŕ","å¡ijåěş"
```

8.5.6 AIMLèęÀçťäăĄőåőŽç¿ľãČŢãĆąãĆďãČń

äžěäÿŇãĄőãĆĺãČşãČĘãĆčãČĘãĆčãĄğãĄŕãĂĄåŕ¿èľśãĆĺãČşãĆÿãČşãĄğä¡£çŤĺåŔŕèČ¡ãĄłAIMLèęÀçťäăĄĺåĞęçŘĘãĆŕãČľãĆźãĆ
èľşçťřãĄŕ *ãĆńãĆźãĆ£ãČăèęÀçť'ă* ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăăĄŢãĄĎãĂĆ

- pattern_nodes ïijŽ patternãĄőåŘĎèęÀçťäăĄőåĞęçŘĘãĆŕãČľãĆźåőŽç¿ľãČŢãĆąãĆďãČńãĆŠæŇĞåőŽãĂĆ
- template_nodes ïijŽ templateãĄőåŘĎèęÀçťäăĄőåĞęçŘĘãĆŕãČľãĆźåőŽç¿ľãČŢãĆąãĆďãČńãĆŠæŇĞåőŽãĂĆ

8.5.7 ãĄİãĄőäżŰãĄõãĆĺãČşãČĘãĆčãČĘãĆč

`rdf` ãĆĺãČşãČĘãĆčãČĘãĆčãĄğæŇĞåőŽãĄŹãĆŃãČŢãĆąãĆďãČńå¡ćåijŔãĄŕãĂĄ*RDFãĆţãČİãČijãČĹ*
ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăăĄŢãĄĎãĂĆ

`usergroups` ãĆĺãČşãČĘãĆčãČĘãĆčãĄğæŇĞåőŽãĄŹãĆŃãČŢãĆąãĆďãČńå¡ćåijŔãĄŕãĂĄSecurityãĄő
ãČęãČijãĆúãĆřãČńãČijãČŮãČŢãĆąãĆďãČń ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăăĄŢãĄĎãĂĆ

äžěäÿŇãĄőãĆĺãČşãČĘãĆčãČĘãĆčãĄńãĄďãĄĎãĄęãĄŕãĂĄåő§èčĚ(ãĆŕãČľãĆźåőŽç¿ľç■L')ãĄńä¿Ĺå■ŸãĄŹãĆŃåĘĚåőźãĆŠåŘńã

- license_keys ïijŽ åď'ŰéČĺæŐěçűŽç■L'ãĄğå£ĚèęÀãĄńãĄłãĆŃãČľãĆďãĆżãČşãĆźãĆ■ãČijãČŢãĆąãĆďãČńãĂĆ
- postprocessors ïijŽ ãČńãĆźãČĺãČşãĆźãĄőå£IJç■ŤæŰĞãĄńår¿ãĄŮãĄęçůĺéŻĘãĆŠèąÑãĄĘåăť'åŘĹãĄőåĞęçŘĘãĆŕãČľãĆźå
- preprocessors ïijŽ ãČłãĆŕãĆĺãĆźãČĹãĄőãČęãČijãĆűçŹžèľśãĄńår¿ãĄŮãĄęçůĺéŻĘãĆŠèąÑãĄĘåăť'åŘĹãĄőåĞęçŘĘãĆŕãČľã
- spelling_corpus ïijŽ ãĆźãČŽãČńãČĄãĆğãČČãĆŕãĆŠèąÑãĄĎåăť'åŘĹãĄőãĆĆãĄĺãĄńãĄłãĆŃãĆşãČijãČŠãĆźãČŢãĆąãĆď'ãĆ

CHAPTER 9

JSON

JSONãĆŠAIMLãĄğåĹľ'çŤÍãĄŹãĆŃãĄ§ãĆĄãĄőæľ'§èČ¡ãĄğãĄŹãĂĆ SubAgent,metadata,æĎŔåŻşèğčéĞĹçţŘæđIJãĄłãĄľ'ãĄőJSO

name/var/dataãĄğæŇĞåőŽãĄŹãĆŃåď'L'æŢřåŘ■ãĄńãĄŕãĂĄget/setãĄğåőŽç¿ľ'ãĄŮãĄ§åď'L'æŢřåŘ■ãĆŠä¡£çŤÍãĄŮãĄ¿ãĄŹãĂĆ varãĄŕãČ■ãČijãĆńãČńåď'L'æŢřãĂĄnameãĄŕãĆřãČ■ãČijãČŘãČńåď'L'æŢřãĂĄdataãĄŕãĆřãČ■ãČijãČŘãČńåď'L'æŢřïijĹAPIãĄŃãĆ ãĄ¿ãĄ§ãĂĄãČąãĆ£ãČĞãČijãĆ£ãĂĄãĆţãČŰãĆÍãČijãĆÿãĆğãČşãČĹãĄőæĹżãĆŁåĂď'ç■L'ãĄőãĆůãĆźãČĘãČäåŻžåőŽåď'L'æŢřåŘ

- åśđæĂğ

ãČŚãČľãČąãČijãĆ£ãČijãĆĘãČåŮŇĞåőŽåĂĽéáĽňæŸŐ				
name	JSONåď'L'æŢřåŘ■		No	ãĆřãČ■ãČijãČŘãČńåď'L'æŢř(name)åŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆãĆ■ãČijåŘ■ãĆŠäż
var	JSONåď'L'æŢřåŘ■		No	ãČ■ãČijãĆńãČńåď'L'æŢř(var)åŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆãĆ■ãČijåŘ■ãĆŠäżŸåŁää
data	JSONåď'L'æŢřåŘ■		No	ãĆřãČ■ãČijãČŘãČńåď'L'æŢř(data)åŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆãĆ■ãČijåŘ■ãĆŠäżŸ
key	ãĆ■ãČijæŇĞåőŽ		No	JSONãČĞãČijãĆ£ãĆŠæŞ■ä¡IJãĄŹãĆŃãĆ■ãČijãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
item		key	No	JSONãČĞãČijãĆ£ãĄŃãĆĽ'ãĆ■ãČijãĆŠåŔŰå¿ŮãĄŹãĆŃåäť'åŘĹãĄńä¡£çŤÍãĄŮãĄ¿ãĄŹã
function		len	No	åŕ¿èśąãĄőJSONãČŮãČ■ãČŚãČĘãĆčãĄŇéĚ■åĹŮãĄőåäť'åŘĹãĂĄéĚ■åĹŮéŢůãĆŠåŔŰå¿
		delete	No	åŕ¿èśąãČŮãČ■ãČŚãČĘãĆčãĆŠåĽ'ŁéŹď'ãĄŮãĄ¿ãĄŹãĂĆéĚ■åĹŮãĄőåäť'åŘĹãĄğindexãĆ
		insert	No	JSONéĚ■åĹŮãĄńåŕ¿ãĄŹãĆŃåĂď'ãĄőè£¡åŁäãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
index	ãĆď'ãČşãČĞãČČãĆŕãĆź		No	JSONãČĞãČijãĆ£ãĆŠåŔŰå¿ŮãĄŹãĆŃåäť'åŘĹãĄőãĆď'ãČşãČĞãČČãĆŕãĆźãĆŠæŇĞåőŽ
type		string	No	æŢřåĂď'ãČżèńŰçŘĘåĂď'ãČżnullåĂď'ãĆŠæŰĞå■ŮåĹŮãĄĺãĄŮãĄęåĞęçŘĘãĄŹãĆŃãĄŞ

jsonèęĄçť'ãäãĄĺãĄŮãĄęãĂĄ`var`, `name`, `data` ãĄőãĄĎãĄŽãĆŇãĄŃãĄŇèĺ■åőŽãĄŢãĆŇãĄęãĄĎãĆŃå£ĚèęĄãĄŇãĄĆãĆŁãĄ¿ãĄ

- å■ŘèęĄçť'ă

AIMLãĄőåď'L'æŢřãĆŠåĂď'ãĄĺãĄŮãĄęæŇĞåőŽãĄŹãĆŃåäť'åŘĹãĄńåśđæĂğãĄğãĄŕæŇĞåőŽãĄğãĄ■ãĄłãĄĎãĄ§ãĆĄãĂĄå■Řè åŃŢä¡IJãĄŕåśđæĂğãĄĺåŘŇãĄŸåŃŢä¡IJãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆåŘŇãĄŸåśđæĂğåŘ■ãĂĄå■ŘèęĄçť'ăåŘ■ãĆŠæŇĞåőŽãĄŮãĄ§åä ãĄ§ãĄăãĄŮãĂĄkeyãĆŠå■ŘèęĄçť'ãäãĄğåĹľ'çŤÍãĄŹãĆŃåäť'åŘĹãĄőãĄ£ãĂĄnameãČżdataãČżvarãĄőåŇžåĹěãĄŕãĄŮãĄęãĄŁãĆŁ

ãČŚãČľãČąãČijãĆ£ãČijãĆĘãČå£Ěéáľňæ ŸŐ			
function	éŰćæŢřåŘ■	No	JSONãĄńåŕ¿ãĄŹãĆŃåĞęçŘĘãĆŠèĺŸè£řãĄŮãĄ¿ãĄŹãĂĆãĄŞãĄŞãĄőfunctionãĄńãĄď'ãĄĎãĄęãĄŕ
index	ãĆď'ãČşãČĞãČČãĆŕãĆź	No	JSONãČĞãČijãĆ£ãĆŠåŔŰå¿ŮãĄŹãĆŃåäť'åŘĹãĄőãĆď'ãČşãČĞãČČãĆŕãĆźãĆŠæŇĞåőŽãĄŮãĄ¿ãĄ
item	ãĆ■ãČijåŘ■åŔŰå¿Ů	No	JSONãČĞãČijãĆ£ãĄŃãĆĽ'ãĆ■ãČijãĆŠåŔŰå¿ŮãĄŹãĆŃåäť'åŘĹãĄńä¡£çŤÍãĄŮãĄ¿ãĄŹãĂĆãĄŞãĄ
key	ãĆ■ãČijæŇĞåőŽ	No	JSONãČĞãČijãĆ£ãĆŠæŞ■ä¡IJãĄŹãĆŃãĆ■ãČijãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ

9.1 å§žælJňåĹľçŤĺæŰźæşŢ

JSONèęAçť ăăAńnameãĂĄdataãĂĄãĆĆãĄŮãĄŘãAŕãĂĄvaråšđæĂğãĄğãĂĄåŕ¿èšąãAĺãAłãĆŃJSONãČĞãČijãĆ£ãĆŠæŇĞåőŽãA
JSONèęAçť ăăAńåĘĚåőźãĆŠèĺ■åőŽãĄŮãA§åăť åŘĹãĂĄåŕ¿èšąãAĺãAłãĆŃJSONãČĞãČijãĆ£ãAńåĂđ ãĆŠèĺ■åőŽãĂĄæŽť æŰřãA
JSONèęAçť ăăAńåĘĚåőźãĆŠèĺ■åőŽãĄŮãAłãĄŃãAçãA§åăť åŘĹãĂĄåL'ŁéŹđ ãĄőåăť åŘĹãĆŠéŹđ ãĄ■ãĂĄåŕ¿èšąãAĺãAłãĆŃãĆ■ã
get ãĄĺåŘŇæğŸãAńãĂĄConfigç■L'ãĄğèĺ■åőŽãĄŢãĆŃãA§âĂİdefault-getâĂİãĄőåĂđ ãĄŃè£ŤãĆŁãA¿ãĄŹãĂĆ
äžëäÿŃãAńãĂĄJSONãĆŠåŕ¿èšąãAĺãAŮãA§åăť åŘĹãAõãČĞãČijãĆ£ãAőåŘŰå¿ŮæŰźæşŢãĂĄèĺ■åőŽæŰźæşŢãĆŠèłňæŸŐãAŮãA
ãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹãAőæĹžãĆŁåĂđ ãĆŠåĹ'çŤĺãĄŹãĆŃä¿ŃãĄğèłňæŸŐãAŮãA¿ãĄŹãĂĆãĆţãČŰãĆĺãČijãĆÿãĆğãČş
`__SUBAGENT__.family` ãĄńä£ÍæŇĄãĄŢãĆŃãĄęãĄĎãĆŃåL'■æŘŘãĄğãĄŹãĂĆ

```
{
    "family": {
        "åŘ■åL'■": "äÿĂéČŐ",
        "èłŢçŤ§æŮě": "19700101",
        "åźt'é¡ć": 48,
        "æĂğåĹě": "male",
        "èĞłåőĚ": { "ä¡ŕæL'Ă": "æİśäžňéČ¡æÿŕåŇž","åžğæĺŹ": "x,y" },
        "åőűæŮŘ": {
            "çĹű": "åd'łéČŐ",
            "ær■": "èŁśå■Ř",
            "åĚĎåijş": [ "äžŇéČŐ", "èŔŁå■Ř" ],
            "å■Ř": [ "äÿL'éČŐ", "æąČå■Ř" ]
        },
        "èęłæĹŽ": {
            "çěŰçĹű": [ "åčńéČŐ", "äžŤéČŐ" ],
            "çěŰær■": [ "äźĚéĞŇå■Ř", "æćĚå■Ř" ],
            "å¿ŞåğL'åęź": [ "åŘšéČŐ", "åŠšå■Ř" ],
            "å■ń": [ "çt'ŮåÿŇå■Ř" ]
        },
        "åŔŃäžž": [ "åŠŇåőŔ", "äžňå■Ř" ],
        "èűčåŚş": [ "ãĆt'ãČńãČŢ", "éĞŐçŘČ" ],
        "çŮĚæ■t'": [ "énŸèąĂåIJğ", "èŁśçšL'çŮĞ" ],
        "ãĆćãČňãČńãĆõãČij": [ "çL'Żäźş", "ãĄİãĄř" ]
    }
}
```

9.1.1 JSONãČĞãČijãĆ£ãĄőåŘŰå¿ŮæŹĆãĄőåšđæĂğ/å■ŘèęAçť ăæŇĞåőŽæŰźæşŢ

åšđæĂğãĄŁãĆĹãĄşå■ŘèęAçť ăăĄőæŇĞåőŽæŰźæşŢãĆŠèłňæŸŐãĄŮãA¿ãĄŹãĂĆ
èĺŸèijL'æŰźæşŢãĄŕçŢřãĄłãĆŁãA¿ãĄŹãĄŃãĂĄĞęçŘEçţŘædIJãĄŕåŘŃãĄŸçţŘædIJãĄńãĄłãĆŁãA¿ãĄŹãĂĆ

ãĆ■ãČijæŇĞåőŽãĄőåĂđåŘŰå¿Ů

âĂIJçĹűâĂİãĄőåĂđ ãĆŠåŘŰå¿ŮãĄŹãĆŃåăť åŘĹãĂĄäžëäÿŃãĄőèĺŸè£řãĆŠèąŃãĄĎãA¿ãĄŹãĂĆ
åšđæĂğãĄőåăť åŘĹãĂĄ . åŇžåĹĞãĆŁãĄğåŘŰå¿ŮãĄŮãA§ãĄĎãĆ■ãČijãĆŠèĺŸèijL'ãĄŮãA¿ãĄŹãĂĆ
å■ŘèęAçť ăăĄőåăť åŘĹãĂĄ<key> ãĄőåĘĚåőźãĄńåŘŰå¿ŮãĄŮãA§ãĄĎãĆ■ãČijãĆŠèĺŸèijL'ãĄŮãA¿ãĄŹãĂĆ

```
<json var="__USER_METADATA__.family.åőűæŮŘ.çĹű" />
<!-- <json var="__USER_METADATA__.family"><key>åőűæŮŘ.çĹű</key></json> ␣
↪äÿŁèĺŸåĘĚåőźãĄĺåŘŇåŃŢä¡IJ-->
```

éĚ■åĹŮãĄőåŘŰå¿Ů

éĚ■åĹŮãĄńãĄłãĄçãĄęãĄĎãĆŃãĂĄâĂİåĚĎåij§âĂİãĄőåĂđ ãĆŠåŘŰå¿ŮãĄŹãĆŃåăť åŘĹãĂĄ
åĂđ ãĄőåŘŰå¿ŮåŘŇæğŸãĂĄ . åŇžåĹĞãĆŁãĄğåŘŰå¿ŮãĄŮãA§ãĄĎãĆ■ãČijãĆŠèĺŸèijL'ãĂĄãĆĆãĄŮãĄŔãĄŕå■ŘèęAçť ă

<key> ãĆŠãĄńèÍŸè£řãĄŹãĆŃãĄŞãĄÍãĄğæŇĞåőŽãĄŮãĄ§éĚ■åĹŮãĆŠåŘŰå¿ŮãĄŮãĄ¿ãĄŹãĂĆ
åő§èąŇçţŘæđIJãĄÍãĄŮãĄęãĂĄ ["äžŇéČŐ", "èŔŁå■Ř"] ãĆŠåŘŰå¿ŮãĄŮãĄ¿ãĄŹãĂĆ

```
<json var="__USER_METADATA__.family.åőűæŮŔ.åĚĎåij§" />
<!-- <json var="__USER_METADATA__.family.åőűæŮŔ"><key>åĚĎåij§</key></json> ␣
↪äÿŁèÍŸåĘĚåőźãĄÍåŘŇåŃŢä¡IJ-->
```

éĚ■åĹŮéŢůãĄőåŘŰå¿Ů

functionãĄńâĂİlenâĂİãĆŠæŇĞåőŽãĄŹãĆŃãĄÍéĚ■åĹŮéŢůãĆŠåŘŰå¿ŮãĄŮãĄ¿ãĄŹãĂĆ
âĂIJåĚĎåij§âĂİãĄőåät'åŘĹãĂĄ 2 ãĆŠåŘŰå¿ŮãĄŮãĄ¿ãĄŹãĂĆ

```
<json var="__USER_METADATA__.family.åőűæŮŔ.åĚĎåij§" function="len"/>
<!-- <json var="__USER_METADATA__.family.åőűæŮŔ.åĚĎåij§"><function>len</function></
↪json>   äÿŁèÍŸåĘĚåőźãĄÍåŘŇåŃŢä¡IJ-->
```

éĚ■åĹŮåĂd'ãĄőåŘŰå¿Ů

éĚ■åĹŮãĄőåĘĚåőźãĆŠåŘŰå¿ŮãĄŹãĆŃåät'åŘĹãĂĄéĚ■åĹŮãĄőãĆd'ãĆşãĆĞãĆČãĆŕãĆźãĆŠèÍŸèijL'ãĄŮãĄ¿ãĄŹãĂĆ
âĂIJåĚĎåij§âĂİãĄő0çŢłçŽőãĄőåĂd'ãĂĄ äžŇéČŐ ãĆŠåŘŰå¿ŮãĄŮãĄ¿ãĄŹãĂĆ

```
<json var="__USER_METADATA__.family.åőűæŮŔ.åĚĎåij§" index="0"/>
<!-- <json var="__USER_METADATA__.family.åőűæŮŔ.åĚĎåij§"><index>0</index></json> ␣
↪äÿŁèÍŸåĘĚåőźãĄÍåŘŇåŃŢä¡IJ-->
```

JSONãĆłãČŰãĆÿãĆğãĆŕãČĹãĄőèęĄçť'äæŢřåŘŰå¿Ů

JSONãĆłãČŰãĆÿãĆğãĆŕãČĹãĄőèęĄçť'äæŢřãĆŠåŘŰå¿ŮãĄŹãĆŃåät'åŘĹãĂĄfunctionãĄń len
ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ familyãĆŠæŇĞåőŽãĄŮãĄ§åät'åŘĹãĄőèęĄçť'äæŢřãĄf 11
ãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

```
<json var="__USER_METADATA__.family" function="len"/>
<!-- <json var="__USER_METADATA__.family"><function>len</function></json> ␣
↪äÿŁèÍŸåĘĚåőźãĄÍåŘŇåŃŢä¡IJ-->
```

JSONãĆłãČŰãĆÿãĆğãĆŕãČĹãĄőãĆ■ãČijãĆŠåŘŰå¿ŮãĄŹãĆŃåät'åŘĹ

JSONãĆłãČŰãĆÿãĆğãĆŕãČĹãĄőãĆ■ãČijãĆŠåŘŰå¿ŮãĄŹãĆŃåät'åŘĹãĂĄitemãĄń key
ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ familyãĄő5çŢłçŽőãĆŠæŇĞåőŽãĄŹãĆŃãĄÍãĂĄ åőűæŮŔ
ãĆŠåŘŰå¿ŮãĄŮãĄ¿ãĄŹãĂĆ

```
<json var="__USER_METADATA__.family" item="key" index="5"/>
<!-- <json var="__USER_METADATA__.family"><item>key</item><index>5</index></json> ␣
↪äÿŁèÍŸåĘĚåőźãĄÍåŘŇåŃŢä¡IJ-->
```

9.1.2 JSONãČĞãČijãĆ£ãĄőæŻť'æŰř

JSONãČĞãČijãĆ£ãĄńæŮćãĄńãĄĆãĆŃãĆ■ãČijãĄőåĂd'ãĆŠåd'L'æŻť'ãĄŹãĆŃåät'åŘĹãĂĄJSONèęĄçť'ãäĄőåĘĚåőźãĄńåĂd'ãĆŠ
åĘĚåőźãĆŠèÍŸèijL'ãĄŹãĆŃãĄŞãĄÍãĄğãĂĄâĂİä¡ŔæL'ĂâĂİãĆŠâĂİæŰřæĺłęIJåĂİãĄńæŻť'æŰřãĄŮãĄ¿ãĄŹãĂĆ
çľžãĄőåĘĚåőźãĄńãĄŹãĆŃåät'åŘĹãĂĄ "" ãĆŠæŇĞåőŽãĄŮãĄęãĄŔãĄäãĄŢãĄĐãĂĆ

```
<json var="__USER_METADATA__.family.èĞłåőĚ.ä¡ŕæL’Ă">æŰřæĺłætIJ</json>
<json var="__USER_METADATA__.family.èĞłåőĚ.åžğæĺŹ">""</json>
<!-- <json var="__USER_METADATA__.family.èĞłåőĚ"><key>ä¡ŕæL’Ă</key>æŰřæĺłætIJ</
↪json>
    <json var="__USER_METADATA__.family.èĞłåőĚ"><key>åžğæĺŹ</key>""</json> ␣
↪äÿŁèĺŸåĘĚåőźãĄĺåŘŇåŃŢä¡IJ-->
```

æŻť æŰřåĽ■

```
"èĞłåőĚ": {"ä¡ŕæL’Ă": "æİśäžňéČ¡æÿŕåŇž", "åžğæĺŹ": "x,y"},
```

æŻť æŰřå¿Ň

```
"èĞłåőĚ": {"ä¡ŕæL’Ă": "æŰřæĺłætIJ", "åžğæĺŹ": ""},
```

JSONãČĞãČijãĆ£ãĄÿãĄőè£¡åŁă

æŰřãĄŮãĄĎãĆ■ãČijãĆŠè£¡åŁãăĄŹãĆŃåăť åŘĹãĂĄæŰřãĄŮãĄĎãĆ■ãČijãĄńåĂď ãĆŠæŇĞåőŽãĄŹãĆŃãĄŞãĄĺãĄğæŰřãĄ§ãĄ

```
<json var="__USER_METADATA__.family.éČţä¿£çŢłåŕů">222-0033</json>
<!-- <json var="__USER_METADATA__.family"><key>éČţä¿£çŢłåŕů</key>222-0033</json> ␣
↪äÿŁèĺŸåĘĚåőźãĄĺåŘŇåŃŢä¡IJ-->
```

æŻť æŰřåĽ■

```
{
    "family":{
        "çŮĚæ■t’": ["éńŸèąĂåIJğ", "èŁśçšL’çŮĞ"],
        "ãĆćãČňãČńãĆőãČij": ["çL’Żäźş", "ãĄİãĄř"]
    }
}
```

æŻť æŰřå¿Ň

```
{
    "family":{
        "çŮĚæ■t’": ["éńŸèąĂåIJğ", "èŁśçšL’çŮĞ"],
        "ãĆćãČňãČńãĆőãČij": ["çL’Żäźş", "ãĄİãĄř"],
        "éČţä¿£çŢłåŕů": "222-0033"
    }
}
```

éĚ■åĹŮãĄőåĘĚåőźãĄőåď ĽæŻť

éĚ■åĹŮãĄőåĘĚåőźãĆŠåď ĽæŻť ãĄŹãĆŃåăť åŘĹãĂĄéĚ■åĹŮãĄőãĆď ãČşãČĞãČČãĆŕãĆźãĆŠèĺŸèijL’ãĄŮãĄ¿ãĄŹãĂĆ
âĂIJèűčåŠşâĂİãĄő0çŢłçŻőãĄőåĂď ãĆŠåď ĽæŻť ãĄŹãĆŃåăť åŘĹãĂĄäžëäÿŇãĄőãĆĹãĄĘãĄńåŘŮå¿ŮãĄŮãĄ¿ãĄŹãĂĆ

```
<json var="__USER_METADATA__.family.èűčåŠş" index="0">ãĆţãČČãĆńãČij</json>
<!-- <json var="__USER_METADATA__.family"><key>èűčåŠş</key><index>0</index>
↪ãĆţãČČãĆńãČij</json>  äÿŁèĺŸåĘĚåőźãĄĺåŘŇåŃŢä¡IJ-->
```

æŻť æŰřåĽ■

```
{
    "family":{
        "èűčåŠş": ["ãĆt’ãČńãČŢ", "éĞŐçŘČ"]
    }
}
```

æŻťæŰřå¿Ň

```
{
    "family":{
        "èŭčåŚş": ["ãĆţãĈČãĆńãČij", "éĞŐçŘČ"]
    }
}
```

éĚ■åĹŮãĄőåď'LæŻť

éĚ■åĹŮãĄńãĄłãĄčãĄęãĄĎãĆŃâĂİèŭčåŚşâĂİãĄőèęĄçť'ãäĆŠåĚĺãĄęåď'LæŻť'ãĄŹãĆŃåăť'åŘĹãĂĄ
åĂŃãĂĚãĄőèęĄçť'ãäĆŠãČĂãČŰãČńãĆŕãĆl'ãČijãČĹãĄğåŻšãĄ£ãĂĄãĆńãČşãČđãĄğåŇžåĹĞãĆŁãĄ¿ãĄŹãĂĆ

```
<json var="__USER_METADATA__.family.èŭčåŚş">"ãĆţãĈČãĆńãČij","éĞčãĆŁ","æŸăçŤżéŚŚèşđ"
↪</json>
<!-- <json var="__USER_METADATA__.family"><key>èŭčåŚş</key>"ãĆţãĈČãĆńãČij","éĞčãĆŁ
↪","æŸăçŤżéŚŚèşđ"</json>  äÿŁèÍŸåĘĚåőźãĄĺåŘŇåŃŢä¡IJ-->
```

ãĆŠæŇĞåőŽãĄŹãĆŃãĄĺãĂĄ

æŻťæŰřåL'■

```
"èŭčåŚş": ["ãĆt'ãČńãČŢ", "éĞŐçŘČ"],
```

æŻťæŰřå¿Ň

```
"èŭčåŚş": ["ãĆţãĈČãĆńãČij","éĞčãĆŁ","æŸăçŤżéŚŚèşđ"],
```

éĚ■åĹŮãĄÿãĄőèęĄçť'äè£¡åŁă

éĚ■åĹŮãĄÿãĄőèęĄçť'äè£¡åŁããĄffunctionãĄńinsertãĆŠæŇĞåőŽãĄŮãĂĄindexãĄğæŇ£åĚěçőĞæL'ĂãĆŠèĺ■åőŽãĄŮãĄ¿ãĄŹãĂĆ
åĚĹéă■ãĄńåĂď'ãĆŠè£¡åŁããĄŹãĆŃåăť'åŘĹãĂĄindexãĄń0ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
ãĈđãĆd'ãČŁãĆźãĆd'ãČşãČĞãĈČãĆŕãĆźãĄŕå¿ŇãĆ■ãĄŃãĆL'ãĄőãĆd'ãČşãČĞãĈČãĆŕãĆźåĂď'ãĆŠèąĺãĄŮãĂĄindexãĄń-
1ãĆŠæŇĞåőŽãĄŹãĆŃãĄĺéĚ■åĹŮãĄőæIJĂå¿ŇãĄńåĂď'ãĆŠè£¡åŁããĄŮãĄ¿ãĄŹãĂĆ
åĂŃãĂĚãĄőèęĄçť'ãäĆŠãČĂãČŰãČńãĆŕãĆl'ãČijãČĹãĄğåŻšãĄ£ãĂĄãĆńãČşãČđãĄğåŇžåĹĞãĆŁãĄ¿ãĄŹãĂĆ

äžěäÿŃãĄőä¿ŃãĄğãĄŕãĂĄéĚ■åĹŮãĄńãĄłãĄčãĄęãĄĎãĆŃâĂİèŭčåŚşâĂİãĄńåŕ¿ãĄŮindex=âĂİ0âĂİãĆŠæŇĞåőŽãĄŮãĂĄéĚ■å

```
<json var="__USER_METADATA__.family.èŭčåŚş" function="insert" index="0">
↪"ãĆţãĈČãĆńãČij","éĞčãĆŁ","æŸăçŤżéŚŚèşđ","æŮĚèąŇ(æţůåd'Ű,åŻ¡åĘĚ)"</json>
<!-- <json var="__USER_METADATA__.family"><key>èŭčåŚş</key><function>insert</
↪function><index>0</index>"ãĆţãĈČãĆńãČij","éĞčãĆŁ","æŸăçŤżéŚŚèşđ","æŮĚèąŇ(æţůåd'Ű,
↪åŻ¡åĘĚ)"</json>   äÿŁèÍŸåĘĚåőźãĄĺåŘŇåŃŢä¡IJ-->
```

æŻťæŰřåL'■

```
"èŭčåŚş": ["ãĆt'ãČńãČŢ", "éĞŐçŘČ"],
```

æŻťæŰřå¿Ň

```
"èŭčåŚş": ["ãĆţãĈČãĆńãČij", "éĞčãĆŁ", "æŸăçŤżéŚŚèşđ", "æŮĚèąŇ(æţůåd'Ű,åŻ¡åĘĚ)",
↪"ãĆt'ãČńãČŢ", "éĞŐçŘČ"],
```

äžěäÿŃãĄőä¿ŃãĄğãĄŕãĂĄéĚ■åĹŮãĄńãĄłãĄčãĄęãĄĎãĆŃâĂİèŭčåŚşâĂİãĄńåŕ¿ãĄŮéĚ■åĹŮèęĄçť'äæŢřãĄőindex=âĂİ2âĂİãĆŚ

```
<json var="__USER_METADATA__.family.èŭčåŚş" function="insert" index="2">
↪"ãĆţãĈČãĆńãČij","éĞčãĆŁ","æŸăçŤżéŚŚèşđ","æŮĚèąŇ(æţůåd'Ű,åŻ¡åĘĚ)"</json>
<!-- <json var="__USER_METADATA__.family"><key>èŭčåŚş</key><function>insert</
↪function><index>2</index>"ãĆţãĈČãĆńãČij","éĞčãĆŁ","æŸăçŤżéŚŚèşđ","æŮĚèąŇ(æţůåd'Ű,
↪åŻ¡åĘĚ)"</json>  äÿŁèÍŸåĘĚåőźãĄĺåŘŇåŃŢä¡IJ-->
```

æŻť æŰřåĽ■

```
"èűčåŚş": ["ãĆt'ãČńãČŢ", "éĞŐçŘČ"],
```

æŻť æŰřå¿Ň

```
"èűčåŚş": ["ãĆt'ãČńãČŢ", "éĞŐçŘČ", "ãĆţãČČãĆńãČij", "éĞčãĆŁ", "æŸäçŤżéŚŚèşđ",
↪"æŮĚèąŇ(æţůåd'Ű,åŻ¡åĘĚ)"],
```

ãĄ¿ãĄ§ãĂĄindex=âĂİ-1âĂİãĄgãĆĆåŘŇæğŸãĄńãĂĄéĚ■åĹŮãĄőæIJĂå¿ŇãĄńåĂd'ãĆŠè£¡åŁããĄŮãĄęãĄĎãĄ¿ãĄŹãĂĆ

```
<json var="__USER_METADATA__.family.èűčåŚş" function="insert" index="-1">
↪"ãĆţãČČãĆńãČij","éĞčãĆŁ","æŸäçŤżéŚŚèşđ","æŮĚèąŇ(æţůåd'Ű,åŻ¡åĘĚ)"</json>
<!-- <json var="__USER_METADATA__.family"><key>èűčåŚş</key><function>insert</
↪function><index>-1</index>"ãĆţãČČãĆńãČij","éĞčãĆŁ","æŸäçŤżéŚŚèşđ",
↪"æŮĚèąŇ(æţůåd'Ű,åŻ¡åĘĚ)"</json>  äÿŁèÍŸåĘĚåőźãĄÍåŘŇåŃŢä¡IJ-->
```

æŻť æŰřåĽ■

```
"èűčåŚş": ["ãĆt'ãČńãČŢ", "éĞŐçŘČ"],
```

æŻť æŰřå¿Ň

```
"èűčåŚş": ["ãĆt'ãČńãČŢ", "éĞŐçŘČ", "ãĆţãČČãĆńãČij", "éĞčãĆŁ", "æŸäçŤżéŚŚèşđ",
↪"æŮĚèąŇ(æţůåd'Ű,åŻ¡åĘĚ)"],
```

éĚ■åĹŮãĄőä¡IJæĹŘ

ãĆńãČşãČđåŇžåĹĞãĆŁãĄőèęAçţ'ããĆŠèÍ■åőŽãĄŹãĆŃãĄÑãĂĄfunctionãĄńinsertãĆŠæŇĞåőŽãĄŮindexãĆŠ0ãĄŃ-1ãĆŠèÍ■åőŽãĄŮãĄ§åăţ'åŘĹãĄńéĚ■åĹŮãĆŠä¡IJæĹŘãĄŮãĄ¿ãĄŹãĂĆ(indexãĄń0ãĆĆãĄŮãĄŔãĄŕ-1äžěåd'ŰãĆŠæŇĞåőŽãĄŮãĄ§åăţ'åŘĹä¡IJæĹŘãĄŢãĆŃãĄ¿ãĄŻãĆŞ)

äžěäÿŃãĄőä¿ŃãĄgãĄŕãĂĄæŰřãĄ§ãĄłéĚ■åĹŮèęAçţ'ããĄÍãĄŮãĄęâĂİå■ęæ■t'åĂİãĆŠä¡IJæĹŘãĄŮãĄęãĄĎãĄ¿ãĄŹãĂĆ

```
<json var="__USER_METADATA__.family.å■ęæ■t'" >"AåřŔå■ęæăą","Bäÿ■å■ęæăą","CéńŸæăą",
↪"Dåd'ğå■ę"</json>
<!-- <json var="__USER_METADATA__.family.å■ęæ■t'" function="insert" index="0">
↪"AåřŔå■ęæăą","Bäÿ■å■ęæăą","CéńŸæăą","Dåd'ğå■ę"</json>  äÿŁèÍŸåĘĚåőźãĄÍåŘŇåŃŢä¡IJ--
↪>
<!-- <json var="__USER_METADATA__.family.å■ęæ■t'" function="insert" index="-1">
↪"AåřŔå■ęæăą","Bäÿ■å■ęæăą","CéńŸæăą","Dåd'ğå■ę"</json>  äÿŁèÍŸåĘĚåőźãĄÍåŘŇåŃŢä¡IJ--
↪>
<!-- <json var="__USER_METADATA__.family"><key>å■ęæ■t'</key><function>insert</
↪function><index>0</index>"AåřŔå■ęæăą","Bäÿ■å■ęæăą","CéńŸæăą","Dåd'ğå■ę"</json> ␣
↪äÿŁèÍŸåĘĚåőźãĄÍåŘŇåŃŢä¡IJ-->
```

ä¡IJæĹŘå¿Ň

```
"å■ęæ■t'": ["AåřŔå■ęæăą","Bäÿ■å■ęæăą","CéńŸæăą","Dåd'ğå■ę"]
```

1èęAçţ'ããĄőåăţ'åŘĹãĄŕãĂĄfunctionãĄńinsertæIJłæŇĞåőŽãĄgJSONãĆłãČŰãĆÿãĆğãĆŕãČĹãĆŠä¡IJæĹŘãĄŹãĆŃãĄŞãĄĺãĄÑãĄ
1èęAçţ'ããĄgãĆĆèęAçţ'ããĄÑåćŮãĄĹãĆŃåăţ'åŘĹãĄŕãĂĄéĚ■åĹŮèęAçţ'ããĄĺãĄŮãĄęä¡IJæĹŘãĄŹãĆŃå£ĚèęĄãĄÑãĄČãĆŁãĄ¿ã

```
<!-- <json var="__USER_METADATA__.family.å■ęæ■t'" function="insert" index="0">
↪"Dåd'ğå■ę"</json>  äÿŁèÍŸåĘĚåőźãĄÍåŘŇåŃŢä¡IJ-->
<!-- <json var="__USER_METADATA__.family.å■ęæ■t'" function="insert" index="-1">
↪"Dåd'ğå■ę"</json>  äÿŁèÍŸåĘĚåőźãĄÍåŘŇåŃŢä¡IJ-->
<!-- <json var="__USER_METADATA__.family"><key>å■ęæ■t'</key><function>insert</
↪function><index>0</index>"Dåd'ğå■ę"</json>  äÿŁèÍŸåĘĚåőźãĄÍåŘŇåŃŢä¡IJ-->
```

æŻť æŰřå¿ŇãĂĄ1èęAçţ'ããĄőéĚ■åĹŮãĄÑä¡IJæĹŘãĄŢãĆŃãĄ¿ãĄŹãĂĆ

```
"å■ęæ■t’": ["Dåd’ğå■ę"]
```

functionãĄńinsertæIJłæŇĞåőŽãĄőåăť åŘĹãĂĄ

```
<json var="__USER_METADATA__.family.å■ęæ■t’" >"Dåd’ğå■ę"</json>
```

æŻť æŰřå¿ŇãĄŕJSONãĆłãČŰãĆÿãĆğãĆŕãČĹãĄŇä¡IJæĹŘãĄŢãĆŇãĄ¿ãĄŹãĂĆ

```
"å■ęæ■t’": "Dåd’ğå■ę"
```

9.1.3 JSONãČĞãČijãĆ£ãĄőåL’ŁéŹď

éĚ■åĹŮãĄőèęĄçť ăåL’ŁéŹď

éĚ■åĹŮãĄőèęĄçť ăãĆŠåL’ŁéŹď ãĄŹãĆŃãĄńãĄŕãĂĄfunctionãĄńdeleteãĂĄindexãĄńåL’ŁéŹď ãĄŹãĆŃèęĄçť ăãĄőçŢłåŔůãĆŠèĺ
æŇĞåőŽãĄŮãĄ§indexãĄőåĂd’ãĆŠåL’ŁéŹď ãĄŮãĄ¿ãĄŹãĂĆ ãČđãĆd’ãČŁãĆźãĆd’ãČşãČĞãČČãĆŕãĆźãĄŕå¿ŇãĆ■ãĄŇãĆL’ãĄőã
1ãĆŠæŇĞåőŽãĄŹãĆŃãĄĺéĚ■åĹŮãĄőæIJĂå¿ŇãĄőåĂd’ãĆŠåL’ŁéŹď ãĄŮãĄ¿ãĄŹãĂĆ

```
<json var="__USER_METADATA__.family.èűčåŚş" index="0" function="delete" />
<!-- <json var="__USER_METADATA__.family.èűčåŚş"><index>0</index><function>delete</
↪function></json>  äÿŁèĺŸåĘĚåőźãĄĺåŘŇåŃŢä¡IJ-->
<json var="__USER_METADATA__.family.èűčåŚş" index="-1" function="delete" />
<!-- <json var="__USER_METADATA__.family.èűčåŚş"><index>-1</index><function>delete
↪</function></json>  äÿŁèĺŸåĘĚåőźãĄĺåŘŇåŃŢä¡IJ-->
```

æŻť æŰřåL’■

```
"èűčåŚş": ["ãĆt’ãČńãČŢ", "éĞŐçŘČ","èł■æŻÿ"],
```

æŻť æŰřå¿Ň

```
"èűčåŚş": ["éĞŐçŘČ"],
```

ãĆ■ãČijãĄőåL’ŁéŹď

ãĆ■ãČijãĆŠåL’ŁéŹď ãĄŹãĆŃåăť åŘĹãĄŕãĂĄfunctionãĄńdeleteãĆŠèĺ■åőŽãĄŮãĄ¿ãĄŹãĂĆ
æŇĞåőŽãĄŢãĆŇãĄ§ãĆ■ãČijãĄŁãĆĹãĄşåĂd’ãĄŇåL’ŁéŹď ãĄŢãĆŇãĄ¿ãĄŹãĂĆ

âĂIJfunctionâĂĬãĄńâĂİdeleteâĂĬãĆŠæŇĞåőŽãĄŹãĆŃãĄŞãĄĺãĄğâĂĬèűčåŚşâĂĬãĆ■ãČijãĄĺåĂd’ãĆŠåL’ŁéŹď ãĄŮãĄ¿ãĄŹãĂĆ

```
<json var="__USER_METADATA__.family.èűčåŚş" function="delete" />
<!-- <json var="__USER_METADATA__.family.èűčåŚş"><function>delete</function></json>
↪   äÿŁèĺŸåĘĚåőźãĄĺåŘŇåŃŢä¡IJ-->
```

æŻť æŰřåL’■

```
"åŔŃäžž": ["åŠŇåőŔ", "äžňå■Ř"],
"èűčåŚş": ["ãĆt’ãČńãČŢ", "éĞŐçŘČ"],
"çŮĚæ■t’": ["énŸèąĂåIJğ", "èŁśçšL’çŮĞ"],
```

æŻť æŰřå¿Ň

```
"åŔŃäžž": ["åŠŇåőŔ", "äžňå■Ř"],
"çŮĚæ■t’": ["énŸèąĂåIJğ", "èŁśçšL’çŮĞ"],
```

9.1.4 JSONå¡ćåijŕãČĞãČijãĆ£ãĄőæŇĞåőŽ

èęĄçť ăãĄĺãĄŮãĄęãĂĄJSONå¡ćåijŕãĄőãČĞãČijãĆ£ãĆŠèĺ■åőŽãĄŹãĆŃåăť åŘĹãĂĄæşćæŃňåijğïijŽ{}ãĄğåŻšãĆŞãĄąJSONãĄć
éĚ■åĹŮãĄőæŞ■ä¡IJãĄğãĆĆæŇĞåőŽãĄğãĄ■ãĄ¿ãĄŹãĄŃãĂĄJSONæŰĞå■ŮåĹŮå¡ćåijŕãĄőèĺŸè£řãĆŠãČłãĆźãČĹãĄğæŇĞåőŽ

JSONå¡ćåijŕãĄĺãĄŮãĄęäÿ■æ■čãĄŇãĄĆãĆŃåăť åŘĹãĂĄèĺ■åőŽãĄŹãĆŃãĄŞãĄĺãĄŕãĄğãĄ■ãĄ¿ãĄŻãĆŞãĂĆ

```
<json var="__USER_METADATA__.family.åőűæŮŔ.çĹű">{"åŘ■åL’■": "åd’łéČŐ", "åźt’é¡ć":␣
↪80}</json>
<!-- <json var="__USER_METADATA__.family.åőűæŮŔ"><key>çĹű</key>{"åŘ■åL’■": "åd’łéČŐ
↪", "åźt’é¡ć": 80}</json>  äÿŁèĺŸåĘĚåőźãĄĺåŘŇåŃŢä¡IJ-->
```

æŻť æŰřåL’■

```
"çĹű": "åd’łéČŐ",
```

æŻť æŰřå¿Ň

```
"çĹű": {
       "åŘ■åL’■": "åd’łéČŐ",
       "åźt’é¡ć": 80
       },
```

åřŽãĂĄæIJňæľ§èČ¡ãĄŕJSONãĄőãĆ■ãČijãĄńåŕ¿ãĄŮãĄęåĘĚåőźãĆŠèĺ■åőŽãĄŹãĆŃãĆĆãĄőãĄğãĄĆãĆŁãĂĄäżëäÿŃãĄőæğŸãĄ
åd’L’æŢřãĄńJSONå¡ćåijŕãĄőåĘĚåőźãĆŠèĺ■åőŽãĄŹãĆŃåăť åŘĹãĄńãĄŕãĂĄ*set*
èęĄçť ăãĆŠä¡£çŤĺãĄŮãĄęãĄŔãĄăãĄŢãĄĎãĂĆ

```
<!-- èĺ■åőŽäÿ■åŔŕ --> <json var="__USER_METADATA__">{"family": {"åőűæŮŔ": {"çĹű": {
↪"åŘ■åL’■": "åd’łéČŐ", "åźt’é¡ć": 80}}}}</json>

<!-- èĺ■åőŽåŔŕèČ¡ --> <set var="__USER_METADATA__">{"family": {"åőűæŮŔ": {"çĹű": {
↪"åŘ■åL’■": "åd’łéČŐ", "åźt’é¡ć": 80}}}}</set>
```

9.1.5 ãČłãĆźãČĹå¡ćåijŕãČĞãČijãĆ£ãĄőæŇĞåőŽ

èęĄçť ăãĄĺãĄŮãĄęãĂĄãČłãĆźãČĹå¡ćåijŕãĄőãČĞãČijãĆ£ãĆŠèĺ■åőŽãĄŹãĆŃåăť åŘĹãĂĄèğŠæŃňåijğïijŽ[]ãĄğåŻšãĄ£ãĂĄèĺ■å
ãČłãĆźãČĹå¡ćåijŕãĄĺãĄŮãĄęäÿ■æ■čãĄŇãĄĆãĆŃåăť åŘĹãĂĄèĺ■åőŽãĄŹãĆŃãĄŞãĄĺãĄŕãĄğãĄ■ãĄ¿ãĄŻãĆŞãĂĆ

```
<json var="__USER_METADATA__.family.èűčåŚş">["ãĆţãČČãĆńãČij","éĞčãĆŁ","æŸäçŤżéŚŚèşđ
↪"]</json>
<!-- <json var="__USER_METADATA__.family"><key>èűčåŚş</key>["ãĆţãČČãĆńãČij","éĞčãĆŁ
↪","æŸäçŤżéŚŚèşđ"]</json>  äÿŁèĺŸåĘĚåőźãĄĺåŘŇåŃŢä¡IJ-->
```

æŻť æŰřåL’■

```
"èűčåŚş": ["ãĆt’ãČńãČŢ", "éĞŐçŘČ"],
```

æŻť æŰřå¿Ň

```
"èűčåŚş": ["ãĆţãČČãĆńãČij", "éĞčãĆŁ", "æŸäçŤżéŚŚèşđ"],
```

åřŽãĂĄæIJňæľ§èČ¡ãĄŕJSONãĄőãĆ■ãČijãĄńåŕ¿ãĄŮãĄęåĘĚåőźãĆŠèĺ■åőŽãĄŹãĆŃãĆĆãĄőãĄğãĄĆãĆŁãĂĄäżëäÿŃãĄőæğŸãĄ

```
<!-- èĺ■åőŽäÿ■åŔŕ --> <json var="__USER_METADATA__">["ãĆţãČČãĆńãČij","éĞčãĆŁ",
↪"æŸäçŤżéŚŚèşđ"]</json>
```

9.1.6 æŢřåĂď'ãĂĄçIJ§åĄ¡åĂď'ãĂĄnullãĄőåŘŰãĆŁæĽ'śãĄĎ

AIMLãĄğãĄŕæŰĞå■ŮåĹŮãĄĺãĄŮãĄęãĄőæĽ'śãĄĎãĄŮãĄŃãĄłãĄŘãĂĄJSONãĄőæŢřåĂď'ãĂĄçIJ§åĄ¡åĂď'ãĂĄnullãĆŠçŻť'æ
ãĄŞãĆŇãĆĽ'ãĄőåĘĚåőźãĆŠJSONèęAçť'ããĄńèĺ■åőŽãĄŁãĆĹãĄşåŘŰå¿ŮãĄŹãĆŃåăť'åŘĹãĄőåŃŢä¡IJãĆŠèłňæŸŐãĄŮãĄ¿ãĄŹã

èĺ■åőŽ

èĺ■åőŽæŹĆãĄńãĂĄæŢřåĂď'ãĄõãĄ£ãĆŠæŇĞåőŽãĄŹãĆŃãĄĺåĘĚéĆĺãĄğãĄŕæŢřåĂď'ãĄĺãĄŮãĄęåŘŰãĆŁæĽ'śãĄĎãĄ¿ãĄŹãĂĆ
æŢřåĂď'äžěåď'ŰãĄőæŰĞå■ŮåĹŮãĄŇåŘńãĄ¿ãĆŇãĆŃãĄĺæŰĞå■ŮåĹŮæĽ'śãĄĎãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

çIJ§åĄ¡åĂď'ãĆŠçd'žãĄŹãĂĄâĂİtrueâĂİ,âĂİfalseâĂİãĆŠèĺ■åőŽãĄŮãĄ§åăť'åŘĹãĂĄçIJ§åĄ¡åĂď'ãĄĺãĄŮãĄęJSONãĄńçŹžéŇšãĄ
åĂď'ãĄńnullãĆŠèĺ■åőŽãĄŮãĄ§åăť'åŘĹãĂĄJSONãĄńãĄŕnullãĆŠèĺ■åőŽãĄŮãĄ¿ãĄŹãĂĆ
æŢřåĂď'ãĂĄtrue,false,nullãĆŠæŰĞå■ŮåĹŮãĄĺãĄŮãĄęèĺ■åőŽãĄŹãĆŃåăť'åŘĹãĂĄtypeãĄń `string`
ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ

ä¿Ń:

```
<json var="__USER_METADATA__.family.åźt'é¡ć">30</json>
<json var="__USER_METADATA__.family.æžĂåźt'é¡ć">31æ■ş</json>
<json var="__USER_METADATA__.family.èłŢçŤ§æŮě" type="string">19700101</json>
<json var="__USER_METADATA__.family.èĞłåůśçt'źäżŃ">null</json>
<json var="__USER_METADATA__.family.éŽżèl'śçŢłåŕůèł■èĺij">true</json>
<json var="__USER_METADATA__.family.ãČąãČijãČńèł■èĺij" type="string">false</json>
```

ä¿ŃãĄőèĺ■åőŽçţŘæđIJãĄŕäžěäÿŃãĄőJSONãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

```
{
    "family": {
        "åźt'é¡ć": 30,
        "æžĂåźt'é¡ć": "31æ■ş",
        "èłŢçŤ§æŮě": "19700101",
        "èĞłåůśçt'źäżŃ": null,
        "éŽżèl'śçŢłåŕůèł■èĺij": true,
        "ãČąãČijãČńèł■èĺij": "false"
    }
}
```

åŘŰå¿Ů

JSONèęAçť'ããĄğæŢřåĂď'ãĂĄçIJ§åĄ¡åĂď'ãĂĄnullãĆŠåŘŰå¿ŮãĄŹãĆŃåăť'åŘĹãĂĄãĄŞãĆŇãĆĽ'ãĄŕæŰĞå■ŮåĹŮãĄĺãĄŮãĄęå
æŢřåĂď'ãĄőåăť'åŘĹãĂĄæŢřåĂď'æŰĞå■ŮåĹŮãĂĄçIJ§åĄ¡åĂď'ãĄőåăť'åŘĹâĂİtrueâĂİ,âĂİfalseâĂİãĄőæŰĞå■ŮåĹŮãĂĄnullãĄ

ä¿Ń:

```
<json var="__USER_METADATA__.family.åźt'é¡ć"/>
<json var="__USER_METADATA__.family.æžĂåźt'é¡ć"/>
<json var="__USER_METADATA__.family.èłŢçŤ§æŮě"/>
<json var="__USER_METADATA__.family.éŽżèl'śçŢłåŕůèł■èĺij"/>
<json var="__USER_METADATA__.family.ãČąãČijãČńèł■èĺij"/>
<json var="__USER_METADATA__.family.èĞłåůśçt'źäżŃ"/>
```

åŘŰå¿ŮåĂď'ãĄŕãĂĄäžěäÿŃãĄõãĄĺãĄŁãĆŁåŘĎãĂĚãĄŇæŰĞå■ŮåĹŮãĄğåŘŰå¿ŮãĄŢãĆŃãĆŃãĄ§ãĆĄãĂĄãĆůãČŁãČłãĆłèĺ■

```
30
31æ■ş
19700101
```

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(continued from previous page)

```
true
false
null
```

éŰćéĂčéăĚçŻő: *SubAgent* ãĂĄ*metadata* ãĂĄ*æĎŔåŻşèğčéĞĹ*

CHAPTER 10

NLU

å§žæIJňãĄíãĄŮãĄęãĂĄpatternèęAçt'ăãĄğãĂĄæĎŘåŽşèğčéĞĹåĞęçŘĘãĆŠèąŇãĄĘãĄ§ãĆĄãĄőåőŽç¿l'ãĄğãĄŹãĄŇãĂĄtempla

patternãĄőå■ŘèęAçt'ăãĄíãĄŮãĄę `nlu`
ãĆŠåőŽç¿l'ãĄŹãĆŇãĄíãĂĄéńŸåžęæĎŘåŽşèğčéĞĹãĄõãĆd'ãČşãČĘãČşãČĹãĄíãĄõãČđãČČãČĄãČşãĆřãĄőèl'Ţä¿ąãĆŠèąŇãĄĎã

åŕ¿èl'śåĹűå¿ąãĄğãĄŕãĂĄãĆůãČŁãČłãĆłãĄőèíŸè£řãĄńå¿ŞãĄĎãČńãČijãČńãČŹãČijãĆźãĄőæĎŘåŽşèğčéĞĹãĆŠèąŇãĄčãĄęãĂĄ

ãĄŞãĆŇãĄŕæĎŘåŽşèğčéĞĹãĄõçţŘædIJãĆĹãĆŁãĂĄãĆůãČŁãČłãĆł¡IJæĹŘèĂĚãĄŇèíŸè£řãĄŹãĆŃåĘĚåőźãĆŠåĎłåĚĹãĄŢãĄŹ

ä¿Ńåd'ŰãĄíãĄŮãĄęãĂĄpatternãĄńãČŕãĆd'ãČńãČL'ãĆńãČijãČL'ãĄõãĄ£ãĄŇèíŸè£řãĄŢãĆŇãĄ§categoryãĄŇå■ŸåIJíãĄŹãĆŃåă

å■ŘèęAçt'ăãĄőnluãĆŠåőŽç¿l'ãĄŮãĄ§åăt'åŘĹãĄğãĆĆãĂĄpatternèęAçt'ăãĄőåĘĚåőźãĆŠèíŸèijL'ãĄŹãĆŃãĄíéĂŽåÿÿãĄőãĆŠãĆ£
nluèęAçt'ăãĄőåśđæĂğãĄŕãĂĄ*nlu* ãĆŠåŘĆçĚğãĄŮãĄęãĄŘãĄăãĄŢãĄĎãĂĆ

åřŽãĂĄãĆůãČŁãČłãĆłåĘĚãĄńnluå■ŘèęAçt'ăãĄŇæŇĞåőŽãĄŢãĆŇãĄ§patternãĄŇïijŚãĄd'ãĆĆçĎąãĄĎåăt'åŘĹãĂĄæĎŘåŽşèğč

templateãĄőå■ŘèęAçt'ă *sraix* ãĄőåśđæĂğãĄíãĄŮãĄę `nlu`
ãĆŠæŇĞåőŽãĄŹãĆŃãĄíãĂĄäżżæĎŘãĄőéńŸåžęæĎŘåŽşèğčéĞĹãĆíãČşãĆÿãČşïijĹNLUãĆţãČijãČŘ)ãĄŇãĆL'æĎŘåŽşèğčéĞĹç
NLUãĆţãČijãČŘãĄíãĄőéĂŽä£ąæŰźæşŢãĄńãĄd'ãĄĎãĄęãĄŕãĂĄSubAgentãĄő
NLUéĂŽä£ąãĆd'ãČşãĆ£ãČŢãĆğãČijãĆź ãĆŠåŘĆçĚğãĄŮãĄęãĄŘãĄăãĄŢãĄĎãĂĆ

10.1 å§žælJňåĹľçŤĺæŰźæşŢ

éńŸåžęæĎŘåŽşèğčéĞĹãĄŇãĆL'äżěäÿŇãĄõãČŢãĆl'ãČijãČđãČČãČĹãĄğãĂĄãĆd'ãČşãČĘãČşãČĹãĂĄãĆźãČ■ãČČãČĹãĄőæČĚå

```
{
    "intents": [
        {"intent": "transportation", "score": 0.9 },
        {"intent": "aroundsearch", "score": 0.8 }
    ],
    "slots": [
```

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(continued from previous page)

```
        {"slot": "departure", "entity": "æÌśäžň", "score": 0.85, "startOffset": 3,
↪"endOffset": 5 },
        {"slot": "arrival", "entity": "äžňéČ¡", "score": 0.86, "startOffset": 8,
↪"endOffset": 10 },
        {"slot": "departure_time", "entity": "2018/11/1 19:00", "score": 0.87,
↪"startOffset": 12, "endOffset": 14 },
        {"slot": "arrival_time", "entity": "2018/11/1 11:00", "score": 0.88,
↪"startOffset": 13, "endOffset": 18 }
    ]
}
```

10.1.1 ãĆďãČşãČĘãČşãČĹãĄğãĄóãČđãČČãČĄãČşãĆř

AIMLãĄőpatternãĄőå■ŘèęAçťăăĄÍãĄŮãĄęnluãĆŠèÍŸèijĽãĄŮãĄ¿ãĄŹãĂĆ
äžěäÿŇãĄőä¿ŇãĄğãĄŕãĂĄéńŸåžęæĎŔåŽşèğčéĞĹãĄŇãĆĽè£Ťå■t’ãĄŢãĆŇãĄ§ãĆd’ãČşãČĘãČşãČĹãĄŇ
âĂŸtransportationâĂŹ ãĄńãČđãČČãČĄãĄŮãĂĄå£IJç■ŤæŰĞãĄŇè£ŤãĆŁãĄ¿ãĄŹãĂĆ

```
<category>
    <pattern>
        <nlu intent="transportation" />
    </pattern>
    <template>
        äźŮãĆŁæŔŻãĄĹæąĹåĘĚãĄğãĄŹãĄ■ïij§
    </template>
</category>
```

Input: æÌśäžňãĄŇãĆĽäžňéČ¡ãĄńèąŇãĄ■ãĄ§ãĄĎãĂĆ
Output: äźŮãĆŁæŔŻãĄĹæąĹåĘĚãĄğãĄŹãĄ■ïij§

10.1.2 ãĆďãČşãČĘãČşãČĹåĂŹèčIJãĄńãĄŕãĄĆãĆŇãĄŇãČđãČČãČĄãĄŮãĄłãĄĎãČŚãĆ£ãČijã

äžěäÿŇãĄőä¿ŇãĄŕãĂĄéńŸåžęæĎŔåŽşèğčéĞĹãĄőãĆďãČşãČĘãČşãČĹãĄŇ âĂŸaroundsearchâĂŹ
ãĄőåăť’åŘĹãĄğãĄŹãĂĆ
âĂŸaroundsearchâĂŹ
ãĄŕãĆď’ãČşãČĘãČşãČĹãĄőåĂŹèčIJãĄńãĄĆãĆŁãĄ¿ãĄŹãĄŇãĂĄæIJĂåŕď’åĂŹèčIJãĄğãĄŕãĄłãĄĎãĄ§ãĆĄãČđãČČãČĄãĄŮãĄ
(âĂŸaroundsearchâĂŹ ãĄőåŕď’åžęãĄŇãĂĄâĂŹtransportationâĂŹ
ãĄĺåŘŇãĄŸåăť’åŘĹãĄńãĄŕãČđãČČãČĄãĄŮãĄ¿ãĄŹãĂĆ)

```
<category>
    <pattern>
        <nlu intent="aroundsearch" />
    </pattern>
    <template>
        åŚÍè¿žæd’IJçt’ćãĄğãĄŹãĄ■ïij§
    </template>
</category>
```

Input: æÌśäžňãĄŇãĆĽäžňéČ¡ãĄńèąŇãĄ■ãĄ§ãĄĎãĂĆ
Output: NO_MATCH

10.1.3 æIJĂåřďåĂŹèčIJãĄğãĄłãĄĎåăťåŘĹãĄőãČđãČČãČĄãČşãĆř

ãĆď ãČşãČĘãČşãČĹ âĂŸaroundsearchâĂŹ ãĄŇæIJĂåřďåĂŹèčIJãĄğãĄłãĄŔãĄęãĆĆåŘńãĄ¿ãĆŇãĆŃåăťåŘĹãĄńãČđãČČãČĄãČşãĆřãĄŢãĄŽãĄ§ãĄĎåăťåŘĹãĂĄåśđæĂğ maxLikelihood ãĄń false ãĆŠèĺ■åőŽãĄŮãĄ¿ãĄŹãĂĆ maxLikelihood ãĄŇæIJłæŇĞåőŽãĄőåăťåŘĹãĂĄtrue ãĆŠæŇĞåőŽãĄŮãĄ§åăťåŘĹãĄÍåŘŇãĄŸåŃŢä¡IJãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

```
<category>
    <pattern>
        <nlu intent="aroundsearch" maxLikelihood="false" />
    </pattern>
    <template>
        åŚÍè¿žæď'IJçť'ćãĄğãĄŹãĄ■ïij§
    </template>
</category>
```

Input: æÍśäžňãĄŇãĆĽäžňéČ¡ãĄńèąŇãĄ■ãĄ§ãĄĎãĂĆ
Output: åŚÍè¿žæď'IJçť'ćãĄğãĄŹãĄ■ïij§

10.1.4 scoreæŇĞåőŽãĄğãĄőãČđãČČãČĄ

ãĆď ãČşãČĘãČşãČĹãĄőscoreåĂď ãĄńãĆĹãĆŇãČđãČČãČĄãČşãĆřæİąäżűãĄńãĄď ãĄĎãĄęèłňæŸŐãĄŮãĄ¿ãĄŹãĂĆ åśđæĂğãĄÍãĄŮãĄęãĂĄ scoreGtãĂĄscoreGeãĂĄscoreãĂĄscoreLeãĂĄscoreLtãĄő5çÍőéąđãĄőæŇĞåőŽãĄŇåŘŕèČ¡ãĄÍãĄłãĆŁãĂĄèĺ■åőŽåĘĚåőźãĄŕäżĕäÿŃãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

ãĄ¿ãĄ§ãĂĄãĄŞãĄőåśđæĂğãĆŠæŇĞåőŽãĄŮãĄ§åăťåŘĹãĂĄä£ąéäijåžęãĄğãĄőæŕŤèijČãČđãČČãČĄãČşãĆřãĆŠèąŇãĄĘãĄ§ãĆ maxLikelihood ãĄŕ false æĽśãĄĎãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

ãČŠãĆŕãČąãĂĺåĂď	æŕŤèijČ	èłňæŸŐ
scoreGt	>	åŕ¿èśąãĆď ãČşãČĘãČşãČĹãĄőä£ąéäijåžęãĄŇæŇĞåőŽãĄŮãĄ§åĂď ãĆĹãĆŁåď ğãĄ■ãĄĎåăťåŘĹãĄńãČ
scoreGe	>=	åŕ¿èśąãĆď ãČşãČĘãČşãČĹãĄőä£ąéäijåžęãĄŇæŇĞåőŽãĄŮãĄ§åĂď äżěäÿŁãĄőåăťåŘĹãĄńãČđãČČãČĄ
score	=	åŕ¿èśąãĆď ãČşãČĘãČşãČĹãĄőä£ąéäijåžęãĄŇæŇĞåőŽãĄŮãĄ§åĂď ãĄőæŹĆãĄńãČđãČČãČĄãĄŮãĄ¿ãĄ
scoreLe	<=	åŕ¿èśąãĆď ãČşãČĘãČşãČĹãĄőä£ąéäijåžęãĄŇæŇĞåőŽãĄŮãĄ§åĂď äżěäÿŃãĄőåăťåŘĹãĄńãČđãČČãČĄ
scoreLt	<	åŕ¿èśąãĆď ãČşãČĘãČşãČĹãĄőä£ąéäijåžęãĄŇæŇĞåőŽãĄŮãĄ§åĂď ãĆĹãĆŁåřŔãĄŢãĄĎåăťåŘĹãĄńãČ

scoreXxæŇĞåőŽæŹĆãĄőåŃŢä¡IJãĄŕäżĕäÿŃãĄőãČđãČČãČĄãČşãĆřãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

```
<nlu intent="transportation" scoreGt="0.9"/> ␣
↪transportationãĄńãČđãČČãČĄãČşãĆřãĄŮãĄ¿ãĄŻãĆşãĂĆ
<nlu intent="transportation" scoreGe="0.9"/> ␣
↪transportationãĄńãČđãČČãČĄãČşãĆřãĄŮãĄ¿ãĄŹãĂĆ
<nlu intent="transportation" score="0.9"/> ␣
↪transportationãĄńãČđãČČãČĄãČşãĆřãĄŮãĄ¿ãĄŹãĂĆ
<nlu intent="aroundsearch" scoreLe="0.8"/> ␣
↪aroundsearchãĄńãČđãČČãČĄãČşãĆřãĄŮãĄ¿ãĄŹãĂĆ
<nlu intent="aroundsearch" scoreLt="0.8"/> ␣
↪aroundsearchãĄńãČđãČČãČĄãČşãĆřãĄŮãĄ¿ãĄŻãĆşãĂĆ
```

åřŽãĂąäžěäÿÑãĄőã¿ÑãĄőãĆĹãĄĘãĄńãĂąéŸåžęæĎŔåŻşèğčéĞĹãĄőçţŘæđIJãĄńãĆĹãĄčãĄęèd'ĞæŢřãĄőæİąäžűãĄÑæĹŘçńÑ

èd'ĞæŢřãĄőAIMLãČŢãĆąãĆd'ãČńãĆŠåĹl'çŤĺãĄŹãĆŃåăt'åŘĹãĂĄAIMLãĄőåśŢéŰŃåĞęçŘĘãĆŠãČĞãĆd'ãČňãĆřãČĹãČłåŘ■ãČ

ïijĹãĆţãČŰãČĞãĆčãČňãĆřãČĹãČłãĆŠä¡£çŤĺãĄŹãĆŃåăt'åŘĹãĂĄäÿŁä¡■ãČĞãĆčãČňãĆřãČĹãČłåĘĚãĄőãČŢãĆąãĆd'ãČńãĆŠåĞ

```
<category>
    <pattern><nlu intent="transportation" scoreGe="0.8"/></pattern>
    <template>äźŮãĆŁæŔŻãĄĹæąĺåĘĚãĄğãĄŹãĄ■ïijş</template>
</category>

<category>
    <pattern><nlu intent="aroundsearch" scoreGe="0.8"/></pattern>
    <template>åŚÍè¿žæd'IJçt'ćãĄğãĄŹãĄ■ïijş</template>
</category>
```

10.1.5 ãĆd'ãČşãČĘãČşãČĹãČđãČČãČĄãĄĺãČřãĆd'ãČńãČL'ãĆńãČijãČL'

äžěäÿÑãĄřãĂĄãČńãČijãČńãČŹãČźãĂĄæĎŔåŻşèğčéĞĹçţŘæđIJãĄńãČđãČČãČĄãĄŮãĄłãĄÑãĄčãĄş§åăt'åŘĹãĂĄéŻŚèńĞãĆ
patternãĄĺãĄŮãĄęãČřãĆd'ãČńãČL'ãĆńãČijãČL'ãĄőãĄ£ãĄÑèĺŸè£řãĄŢãĆÑãĄ§categoryãĄÑå■ŸåIJĺãĄŹãĆŃåăt'åŘĹãĂĄãĆůãČ

```
<aiml>
    <category>
        <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ</pattern>
        <template>ãĄŞãĆŞãĄńãĄąãĄŕ</template>
    </category>

    <category>
        <pattern><nlu intent="aroundsearch" /></pattern>
        <template>
            åŚÍè¿žæd'IJçt'ćãĄŮãĄ¿ãĄŹ
        </template>
    </category>

    <category>
        <pattern>
            *
        </pattern>
        <template>
            <sraix service="éŻŚèńĞ"><get var="__USER_UTTERANCE__" /></sraix>
        </template>
    </category>
</aiml>
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕ
Output: ãĄŞãĆŞãĄńãĄąãĄŕ
Input: ãĄŞãĄőè¿žãĆĹãĄőãĆşãČşãČŞãČŃ
Output: åŚÍè¿žæd'IJçt'ćãĄŮãĄ¿ãĄŹ
Input: éŻŚèńĞåŕ¿èl'ś
Output: éŻŚèńĞåŕ¿èl'śãĄőçţŘæđIJãĄğãĄŹ

10.1.6 sraiãĄńåŕ¿ãĄŹãĆŃNLUãČđãČČãČĄ

ãČđãČČãČąçŘæđIJãĄőtemplateãĄń âĂŸsraiâĂŹ èęĄçt'ããĄŇæŇĞåőŽãĄŢãĆŇãĄęãĄĐãĆŃåät'åŘĹãĂĄs-
raiåŕ¿èśąãĄőçŹžèl'śæŰĞãĄŇãĂĄçŔ¿åIJĺä£ÍæŇĄãĄŮãĄęãĄĐãĆŃéńŸåžęçůŕåžęèğčéĞĹçţŘæđIJãĄőåŘŰå¿ŮæŹĆãĄőçŹžèl'śæŰ
åŕ¿èśąçŹžèl'śæŰĞãĄŇçŢřãĄłãĆŃåät'åŘĹãĄńãĂĄsraiåŕ¿èśąãĄőçŹžèl'śæŰĞãĄńåŕ¿ãĄŹãĆŃéńŸåžęæĐŔåŻşèğčéĞĹçţŘæđIJãĄőã

äžěäÿŇãĄőåät'åŘĹãĂĄsraiåĞęçŘĘãĄğãĄőéńŸåžęæĐŔåŻşèğčéĞĹçţŘæđIJãĄőåĘ■åŘŰå¿ŮãĄŕèąŇãĄĐãĄ¿ãĄŻãĆŞãĂĆ

```
<aiml>
    <category>
        <pattern><nlu intent="transportation" /></pattern>
        <template>
            ãĄŤåÿŇæIJŻ
            <srai><input /></srai>
        </template>
    </category>

    <category>
        <pattern>
            *
        </pattern>
        <template>
            æL'£ãĆŁãĄ¿ãĄŮãĄ§
        </template>
    </category>
</aiml>
```

Input: æİśäžñãĄŃãĆĽäžńéČ¡ãĄńèąŇãĄ■ãĄ§ãĄĐãĂĆ
Output: ãĄŤåÿŇæIJŻæL'£ãĆŁãĄ¿ãĄŮãĄ§ãĂĆ

10.2 NLUãČĞãČijãĆ£ãĄőåŘŰå¿Ů

NLUãĄőãČĞãČijãĆ£ãĄŕãĂĄãČ■ãČijãĆńãČńåď'L'æŢř(var) __SYSTEM_NLUDATA__
ãĄńåśŢéŰŃãĄŢãĆŇãĄ¿ãĄŹãĄŇãĂĄAPIåď'L'æŢřãĄĺåŘŇægŸãĄńæL'śãĄĘãĄ§ãĆĄãĂĄãČňãĆźãČĺãČşãĆźãĆŠè£Ťå■t'ãĄŹãĆŃ

ãĄ§ãĄăãĄŮãĂĄsraiåĞęçŘĘæŹĆãĄńéńŸåžęæĐŔåŻşèğčéĞĹçţŘæđIJãĄőåĘ■åŘŰå¿ŮãĄŇèąŇãĆŔãĆŇãĄ§åät'åŘĹãĂĄåĘĚåőźãĄ
JSONèęĄçt'ããĆŠçŤĺãĄĐ *æĐŔåŻşèğčéĞĹçţŘæđIJ*
ãĄőãČĞãČijãĆ£ãĆŠåŘŰå¿ŮãĄŹãĆŃä¿ŃãĆŠçd'žãĄŮãĄ¿ãĄŹãĂĆ

```
<category>
    <pattern>
        <nlu intent="transportation" />
    </pattern>
    <template>
        <think>
                <set var="slot"><json var="__SYSTEM_NLUDATA__.slots"><index>1</
↪index></json></set>
                <set var="entity"><json var="slot.entity" /></set>
                <set var="score"><json var="slot.score" /></set>
        </think>
        <get var="entity"/>ãĄőscoreãĄŕ<get var="score" />ãĄğãĄźãĂĆ
    </template>
</category>
```

Input: æÌśäžňãĄŃãĆĽäžňéČ¡ãĄńèąŇãĄ■ãĄ§ãĄĎãĂĆ
Output: æÌśäžňãĄőscoreãĄŕ0.85ãĄğãĄŹãĂĆ

éŰćéĂčéäĚçŻő: *nlu*ãĂĄ *JSONèęÀçţ'ă*

10.3 NLUãĆd'ãČşãČĘãČşãČĹãĄőåŔŰå¿Ů

templateãĄğãĆd'ãČşãČĘãČşãČĹãĄőåĘĚåőźãĆŠåŔŰå¿ŮãĄŹãĆŃåăt'åŘĹãĂĄ *nluintent*
ãĆŠä¡£çŤĺãĄŮãĄ¿ãĄŹãĂĆ

NLUåĞęçŘĘçţŘæđIJãĄĺãĄŮãĄęãĂĄäżěäÿŃãĄőçţŘæđIJãĆŠåŔŰå¿ŮãĄŮãĄęãĄĎãĆŃåĽ■æŔŘãĄğãĆd'ãČşãČĘãČşãČĹæČĚåăś

```
{
    "intents": [
        {"intent": "restaurantsearch", "score": 0.9 },
        {"intent": "aroundsearch", "score": 0.4 }
    ],
    "slots": [
        {"slot": "genre", "entity": "ãĆd'ãĆ£ãČłãĆćãČş", "score": 0.95, "startOffset
↪": 0, "endOffset": 5 },
        {"slot": "genre", "entity": "ãČŢãČñãČşãČĄ", "score": 0.86, "startOffset":␣
↪7, "endOffset": 10 },
        {"slot": "genre", "entity": "äÿ■èŔŕ", "score": 0.75, "startOffset": 12,
↪"endOffset": 14 }
    ]
}
```

NLUãĄğåĞęçŘĘãĄŮãĄ§ãĆd'ãČşãČĘãČşãČĹæČĚåăśãĆŠåŔŰå¿ŮãĄŹãĆŃä¿ŃãĄğãĄŹãĂĆmapãĄńãĄŕæŢřåĂd'ãĆŠãĆńãĆęãČşãĆ
intentCountãĄńãĆd'ãČşãČĘãČşãČĹæŢřãĆŠä£ÌæŃĄãĄŮconditionãĄőæÌąäżűãĄĺãĄŮãĄęintentCountæŢřãĄńãĄłãĆŃãĄ¿ãĄğãĂĄ

```
<category>
    <pattern>
        <nlu intent="restaurantsearch"/>
    </pattern>
    <template>
        <think>
          <set var="count">0</set>
          <set var="intentCount"><nluintent name="*" item="count" /></set>
        </think>
        <condition>
            <li var="count"><value><get var="intentCount" /></value></li>
            <li>
                intent:<nluintent name="*" item="intent"><index><get var="count" />
↪</index></nluintent>
                score:<nluintent name="*" item="score"><index><get var="count" /></
↪index></nluintent>
                <think>
                    <set var="count"><map name="upcount"><get var="count" /></map>
↪</set>
                </think>
                <loop/>
            </li>
        </condition>
    </template>
</category>
```

Input: ãĆd'ãĆ£ãČłãĆćãČşãĄŃãČŢãČňãČşãČĄãĄŃäÿ■èŘŕãĆŠæŐćãĄŮãĄęãĂĆ
Output: intent:restaurantsearch score:0.9 intent:aroundsearch score:0.4

åřŽãĂĄtemplateãĄőå■ŘèęAçt'ăsraixãĆŠåĹl'çŤĺãĄŮãĄęæĎŘåŽşèğčéĞĹçţŘæđIJãĆŠåŘŰå¿ŮãĄŮãĄşåät'åŘĹãĂĄnluintentãĄőåś
__SUBAGENT_NLU__.ãĆĺãĆd'ãČłãĆćãĆźåŘ■ãĄőæŇĞåőŽãĄŇå£ÈèęĄãĄğãĄŹãĄŇãĂĄåŘŇæğŸãĄőæŞ■ä¡IJãĄŇèąŇãĄ

éŰćéĂčéăĚçŻő: *nluintent*

10.4 NLUãĆźãČ■ãČČãČĹãĄőåŘŰå¿Ů

templateãĄğNLUåĞęçŘEçţŘæđIJãĄőãĆźãČ■ãČČãČĹãĄőåĘĚåőźãĆŠåŘŰå¿ŮãĄŹãĆŃåät'åŘĹãĂĄ *nluslot*
ãĆŠä¡£çŤĺãĄŮãĄ¿ãĄŹãĂĆ

NLUåĞęçŘEçţŘæđIJãĄĺãĄŮãĄęäźëäÿŃãĄőçţŘæđIJãĆŠåŘŰå¿ŮãĄŮãĄęãĄĎãĆŃãĄŞãĄĺãĆŠåĽ■æŘŘãĄĺãĄŮãĄęãĆźãČ■ãČČã

```
{
    "intents": [
        {"intent": "restaurantsearch", "score": 0.9 },
        {"intent": "aroundsearch", "score": 0.4 }
    ],
    "slots": [
        {"slot": "genre", "entity": "ãĆd'ãĆ£ãČłãĆćãČş", "score": 0.95, "startOffset
↪": 0, "endOffset": 5 },
        {"slot": "genre", "entity": "ãČŢãČňãČşãČĄ", "score": 0.86, "startOffset":␣
↪7, "endOffset": 10 },
        {"slot": "genre", "entity": "äÿ■èŘŕ", "score": 0.75, "startOffset": 12,
↪"endOffset": 14 }
    ]
}
```

NLUãĄğåĞęçŘEãĄŮãĄşãĆźãČ■ãČČãČĹæČĚåăśãĆŠåŘŰå¿ŮãĄŹãĆŃä¿ŃãĄğãĄŹãĂĆmapãĄńãĄŕæŢřåĂd'ãĆŠãĆńãĆęãČşãČĹ
slotCountãĄńãĆźãČ■ãČČãČĹæŢřãĆŠä£ÍæŇĄãĄŮconditionãĄőæÍąäżűãĄĺãĄŮãĄęslotCountæŢřãĄńãĄłãĆŃãĄ¿ãĄğãĂĄåŘĎãĆ

```
<category>
    <pattern>
        <nlu intent="restaurantsearch" />
    </pattern>
    <template>
        <think>
          <set var="count">0</set>
          <set var="slotCount"><nluslot name="*" item="count" /></set>
        </think>
        <condition>
            <li var="count"><value><get var="slotCount" /></value></li>
            <li>
                slot:<nluslot name="*" item="slot"><index><get var="count" /></
↪index></nluslot>
                entity:<nluslot name="*" item="entity"><index><get var="count" /></
↪index></nluslot>
                score:<nluslot name="*" item="score"><index><get var="count" /></
↪index></nluslot>
                <think>
                    <set var="count"><map name="upcount"><get var="count" /></map>
↪</set>
                </think>
                <loop/>
            </li>
```

(continues on next page)

(continued from previous page)

```
        </condition>
    </template>
</category>
```

Input: ãĆd'ãĆ£ãČłãĆćãČşãĄÑãČŢãČňãČşãČĄãĄÑäÿ■èŔfãĆŠæŐćãĄŮãĄęãĂĆ
Output: slot:genre entity:ãĆd'ãĆ£ãČłãĆćãČş score:0.95 slot:genre entity:ãČŢãČňãČşãČĄ score:0.86 slot:genre entity:äÿ■èŔf score:0.75

åřŽãĂĄtemplateãĄőå■ŘèęAçt'ăsraixãĆŠåĹl'çŤĺãĄŮãĄęæĎŔåŽşèğčéĞĹçţŘæđIJãĆŠåŔŰå¿ŮãĄŮãĄ§åăt'åŘĹãĂĄnluslotãĄőåśđa
__SUBAGENT_NLU__.ãĆĺãĆd'ãČłãĆćãĆźåŘ■ãĄőæŇĞåőŽãĄŇå£ÉèęĄãĄgãĄŹãĄÑãĂĄåŘŇægŸãĄőæŞ■ä¡IJãĄÑèąÑãA
éŰćéĂčéăĚçŻő: *nluslot*

10.5 èd'ĞæŢřãĄőNLUãĆţãČijãČŘåĹl'çŤĺ

énŸåžęæĎŔåŽşèğčéĞĹãĄőçţŘæđIJåŔŰå¿ŮãĄńèd'ĞæŢřãĄőNLUãĆţãČijãČŘãĆŠåĹl'çŤĺãĄŹãĆŃåăt'åŘĹãĂĄ
nlu_serversãČŢãĆąãĆd'ãČń ãĆŠä¡£çŤĺãĄŮãĄ¿ãĄŹãĂĆ

nlu_serversãČŢãĆąãĆd'ãČńãĄğèd'ĞæŢřãĄőNLUãĆţãČijãČŘãĆŠæŇĞåőŽãĄŮãĄ§åăt'åŘĹãĂĄèĺŸè£řãĄŢãĆŃãĄ§éăĘåžŔãĄńå¿

ïijĹéĂŤäÿ■ãĄőNLUãĆţãČijãČŘãĄĺãĄőéĂŽä£ąãĄńåd'śæŢŮãĄŮãĄ§åăt'åŘĹãĄğãĆĆãĂĄæňąãĄőNLUãĆţãČijãČŘãĄĺãĄőéĂŽä£

patternãĄĺãĄŮãĄęãČŕãĆd'ãČńãČL'ãĆńãČijãČL'ãĄõãĄ£ãĄŇèĺŸè£řãĄŢãĆŃãĄ§categoryãĄŇå■ŸåIJĺãĄŹãĆŃåăt'åŘĹãĂĄæŇĞåő

ãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşåőŽç¿l'ä¿Ń

```
brain:
  nlu:
    classname: programy.nlu.cotobadesignNlu.CotobadesignNlu
    use_file: true
```

nlu_serversãČŢãĆąãĆd'ãČńåőŽç¿l'ä¿Ń

```
nlu:
  - url: http://localhost:5201/run
  - url: http://localhost:3000/run
    apikey: test_key
```

ãĆůãČŁãČłãĆłãĄőèĺŸè£řãĄńãĄŕçL'źåĹěãĄłæŇĞåőŽãĄŕãĄĆãĆŁãĄ¿ãĄŻãĆŞãĂĆ

åřŽãĂĄnlu_serversãČŢãĆąãĆd'ãČńãĄőèĺŸè£řãĄńæIJL'åŁźãĄłãĆţãČijãČŘïijĹURLïijL'åőŽç¿l'ãĄŇçĎąãĄĎåăt'åŘĹãĂĄãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşåőŽç¿l'ãĄńãĆĆæIJL'åŁźãĄłURLãĄŇçĎąãĄĎåăt'åŘĹãĂĄéńŸåžęæĎŔåŽşèğčéĞĹéĂčæŘž

10.6 NLUãĆţãČijãČŘãĄĺãĄőéĂŽä£ąææŹĆéŰŞçőąçŘĘ

ãČđãČČãČĄåĞęçŘĘãĄgèąÑãĄĘNLUãĆţãČijãČŘãĄĺãĄőéĂŽä£ąãĄńår¿ãĄŮãĄęãĂĄæIJĂåd'ğãĄőéĂŽä£ąæŹĆéŰŞãĆŠæŇĞåőŽ

ïijĹèd'ĞæŢřãĆţãČijãČŘãĆŠåĹl'çŤĺãĄŹãĆŃåăt'åŘĹãĄńãĄŕãĂĄæňąãĄőãĆţãČijãČŘãĄÿãĄőéĂŽä£ąãĄńçğżãĆŁãĄ¿ãĄŹãĂĆïijL'

äžěäÿŃãĄőïijŠéĂŽãĆŁãĄőæŇĞåőŽãĄŇåŔŕèČ¡ãĄgãĂĄnlu_serversãČŢãĆąãĆd'ãČńãĄőåőŽç¿l'ãĄŇåĎłåĚĹãĄŢãĆŃãĄ¿ãĄŹãĂĆ

ãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşåőŽç¿l'ä¿Ń

```
brain:
  nlu:
    classname: programy.nlu.cotobadesignNlu.CotobadesignNlu
    url: http://localhost:5201/run
    timeout: 1
```

nlu_serversãČŢãĆąãĆd'ãČńåőŽç¿l'ä¿Ń

```
nlu:
  url: http://localhost:5201/run
timeout: 1
```

åŔĹãĂĄåŘĎNLUãĆţãČijãČŘãĄĺãĄőéĂŽä£ąæŹĆéŰŞïijĹãČňãĆd'ãČĘãČşãĆůïijL'ãĄŕãĂĄäżěäÿÑãĄőJSONå¡ćåijŔãĄğãĂĄãČ■ã
ãĄńæăijçţ'■ãĄŢãĆŇãĄ¿ãĄŹãĂĆ

ä¡ĘãĄŮãĂĄãĆůãČŁãČłãĆłãĄğãĄŞãĄőåd'L'æŢřåÄd'ãĆŠåŔŰå¿ŮãĄŹãĆŃçĆžãĄńãĄŕãĂĄãČđãČČãČĄãĄŹãĆŃCategoryãĆŠä¡£

âĂżãČĞãČŘãČČãĆřAPIãĄğåĞžåŁŻãĄŢãĆŇãĆŃåŕ¿èl'śåśěæ■ť'æČĚåăśãĄńãĄŕæăijçţ'■ãĄŢãĆŇãĄęãĄĎãĄ¿ãĄŹãĂĆ

```
{
  "latency": [
    {"ãĆţãČijãČŘåŘ■", çğŠå■Ÿä¡■ãĄőåřŔæŢřçĆźäżŸãĄ■æŢřåÄd'},
      :
  ]
}
```

âĂżãĆţãČijãČŘåŘ■ãĄńãĄŕãĂĄnlu_serversãČŢãĆąãĆd'ãČńãĄőåőŽç¿l'ãĄńåŘĹãĆŔãĄŻãĄ§ âĂŸNONAME-
åőŽç¿l'éăĘ(0~)âĂŹãĂĄåŔĹãĄŕãĂĄâĂŹserversâĂŹ ãĄğäżŸäÿŐãĄŮãĄ§ãĆĺãĆd'ãČłãĆćãĆźåŘ■ãĄŇèĺ■åőŽãĄŢãĆŇãĄ¿ãĄŹãĂĆ

CHAPTER 11

metadata

11.1 æęĆèęĄ

åŕ¿èľśAPIãČłãĆŕãĆĺãĆźãČĹãČIJãČĞãĆčãĄńèĺ■åőŽãĄŢãĆŇãĄ§ meta-
dataæČĚåăśãĄŕãĂĄãĆůãČŁãČłãĆłãĄőåď'L'æŢřãČĞãČijãĆ£(ãČĘãĆ■ãĆźãČĹãĂąãĄ¿ãĄ§ãĄŕãĂĄJSON)ãĄĺãĄŮãĄęçŤĺãĄĎãĆŇ
ãĄ¿ãĄ§ãĂĄåŕ¿èľśAPIãČňãĆźãČĺãČşãĆźãČIJãČĞãĆčãĄńèĺ■åőŽãĄŹãĆŇ meta-
dataæČĚåăśãĆĆãĂĄãĆůãČŁãČłãĆłãĄőåď'L'æŢřãČĞãČijãĆ£ãĄĺãĄŮãĄęèĺ■åőŽãĄŹãĆŇãĄŞãĄĺãĄŇãĄğãĄ■ãĄ¿ãĄŹãĂĆ

11.2 åŕ¿èľśAPIãĄğèĺ■åőŽãĄŢãĆŇãĄ§metadataãĄőåĽ'çŤĺ

åŕ¿èľśAPIãČłãĆŕãĆĺãĆźãČĹãĄğJSONãĄőèęĄçţ'ăăĄĺãĄŮãĄęæŇĞåőŽãĄŢãĆŇãĄ§ meta-
dataæČĚåăśãĆŠãĂĄåŕ¿èľśãĆůãČŁãČłãĆłãĄğåĽľçŤĺåŔŕèČ¡ãĄłåď'L'æŢřãĄńåśŢéŰŇãĄŮãĄ§çŁűæĚŇãĄğä£ÌæŇĄãĄŮãĄ¿ãĄŹãĄ
APIãĄŃãĆL'æÿąãĄŢãĆŇãĄ§JSONåĘĚãĄő `metadata` èęĄçţ'ăăĄŕãĂĄåď'L'æŢřåŘ■ `__USER_METADATA__`
ãĄńåśŢéŰŇãĄŮãĄ¿ãĄŹãĂĆ
metadataèęĄçţ'ăăĄŃJSONå¡ćåijŔãĄőåăţ'åŘĹãĂĄ *json*
ãĆ£ãĆŕãĆŠçŤĺãĄĎãĆŇãĄŞãĄĺãĄğãĂĄ__USER_METADATA__åĘĚãĄőèęĄçţ'ăăĆŠåŔŰå¿ŮãĄŹãĆŇãĄŞãĄĺãĄŇãĄğãĄ■ãĄ¿ãĄ

__USER_METADATA__ãĄőåĘĚåőźãĄŕãĂĄåŕ¿èľśAPIãĄőãČňãĆźãČĺãČşãĆźãĆŠè£ŤåŁt'ãĄŹãĆŇãĄ¿ãĄğãĄőéŰŞæIJL'åŁźãĄğã

ãČąãĆ£ãČĞãČijãĆ£åď'L'æŢř__USER_METADATA__ãĄŕãČ■ãČijãĆńãČńåď'L'æŢřïijĹvarïijL'ãĄĺãĄŮãĄęæL'śãĄĎãĄ¿ãĄŹãĄŃãĄ

11.2.1 metadataãĄőåď'L'æŢřãĄÿãĄőåśŢéŰŇæŰźæşŢ

åŕ¿èľśAPIãĄŃãĆL'metadataãĄĺãĄŮãĄęæÿąãĄŢãĆŇãĄ§ãČĞãČijãĆ£ãĆŠãĂĄåď'L'æŢř__USER_METADATA__ãĄńåśŢéŰŇãĄŮ

metadataãĄńãĄŕãĂĄãČĘãĆ■ãĆźãČĹãČĞãČijãĆ£ãĄĺãĂĄJSONãČĞãČijãĆ£ãĆŠèĺ■åőŽãĄŹãĆŇãĄŞãĄĺãĄŇãĄğãĄ■ãĂĄåŘĎãĂ

åřŽãĂĄäžěäÿŇãĄőèłňæŸÕãĄğãĄŕãĂĄmyServiceãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹãĆŠåĹľçŤĺãĄŮãĄęæČĚåăśãĆŠåŔŰå¿ŮãĄŮãĂ

è£Ťå■ť'ãĄŢãĆŇãĄ§ãČĞãČijãĆ£ãĄŕãĂĄåď'L'æŢř __SUBAGENT__.myService
ãĄńåśŢéŰŇãĄŢãĆŇãĄęãĄĎãĄ¿ãĄŹãĂĆãĆţãČŰãĆĺãČijãĆÿãĆĞãČşãČĹéĂčæŘžãĄńãĄď'ãĄĎãĄęãĄőèľşçť'řãĄŕãĂĄ
SubAgent ãĆŠåŔĆçĔĞãĄŮãĄęãĄŔãĄăãĄŢãĄĎãĂĆ

```
{
    "transportation": {
        "station": {
            "departure": "æİśäžň",
            "arrival": "äžňéČ¡"
        },
        "time": {
            "departure": "2018/11/1 11:00",
            "arrival": "2018/11/1 13:30"
        },
        "facility": ["éź£èŃŚåŕž", "æÿĔært'åŕž", "äijŔèęŃçÍšè■ůåd'ğçd'¿"]
    }
}
```

ãČĘãĆ■ãĆźãČĹãČĞãČijãĆ£ãĄĺãĄŮãĄęãĄőåŔŰãĆŁæĽśãĄĎæŰź

ãČĘãĆ■ãĆźãČĹãČĞãČijãĆ£ãĄőåăt'åŘĹãĂĄåď'L'æŢř__USER_METADATA__ãĄńåŕ¿ãĄŹãĆŃ *get*
ãĆ£ãĆŕãĄğåĘĔåőźãĆŠåŔŰå¿ŮãĄŹãĆŃãĄŞãĄĺãĄŇãĄğãĄ■ãĄ¿ãĄŹãĂĆ

åŕ¿èľśAPIãĆşãČijãČńãĄőmetadataãĄĺãĄŮãĄęãĂĄäžěäÿŃãĄőãĆĹãĄĘãĄńæŰĞå■ŮåĹŮãĄŇäÿÕãĄĹãĆL'ãĆŃãĄ§åăt'åŘĹãĆŠèł

```
{
    "locale": "ja-JP",
    "time": "2018-07-01T12:18:45+09:00",
    "topic": "*",
    "utterance": "subagent ãĄŞãĆŞãĄńãĄąãĄŕ",
    "metadata": "ãČąãĆ£ãČĞãČijãĆ£ãČĘãĆźãČĹ"
}
```

ãĆůãČŁãČłãĆłãĄńãĄŕäžěäÿŃãĄőãĆĹãĄĘãĄńèÍŸèijL'ãĄŮãĄ¿ãĄŹãĂĆ
__USER_METADATA__ãĄőåĘĔåőźãĆŠ *get* ãĆ£ãĆŕãĄğåŔŰå¿ŮãĄŮãĂĄ *sraix*
ãĆ£ãĆŕãĄőåĘĔåőźãĄĺãĄŮãĄęèĺ■åőŽãĄŹãĆŃãĄŞãĄĺãĄğãĂĄmyService
ãĆţãČŰãĆĺãČijãĆÿãĆĞãČşãČĹãĄńåijŢãĄ■æÿąãĄŮãĄ¿ãĄŹãĂĆ
ãĆţãČŰãĆĺãČijãĆÿãĆĞãČşãČĹãĄőè£Ťå■ť'ãČĞãČijãĆ£ãĄŕãĂĄ __SUBAGENT__.myService
ãĄńä£ÍæŇãĄŢãĆŇãĄęãĄŁãĆŁ(èľşçť'řãĄŕ *SubAgent*
ãĄńèÍŸèijL')ãĂĄèęĄçť'ăãĄőãĆ■ãČijãĆŠæŇĞåőŽãĄŹãĆŃãĄŞãĄĺãĄğJSONåĘĔãĄőåĂd'ãĆŠåŔŰå¿ŮãĄŮãĄęãĄĎãĄ¿ãĄŹãĂĆ

```
<aiml>
    <!-- sub agent execute -->
    <category>
        <pattern>subagent *</pattern>
        <template>
            <think>
                <sraix service="myService">
                    <star /><space />
                    <get var="__USER_METADATA__" />
                </sraix>
                <set name="departure"><json var="__SUBAGENT__.myService.
↪transportation.station.departure" /></set>
                <set name="arrival"><json var="__SUBAGENT__.myService.
↪transportation.station.arrival" /></set>
```

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```
            </think>
            <get name="departure"/>ãĄŃãĆL'<get name="arrival"/>
↪ãĄ¿ãĄğãĆŠæd'IJçt'ćãĄůãĄ¿ãĄŹãĂĆ
        </template>
    </category>
</aiml>
```

ãČęãČijãĆűçŹžèl'śãĄŇãĂŇsubagent ãĄŞãĆŞãĄńãĄąãĄŕãĂ■ãĄőåät'åŘĹãĂĄäžëäÿŃãĄőãĆĹãĄĘãĄńåśŢéŰŃãĄŢãĆŇãĄ§ãČĞãČ

åijŢæŢřçŢłåŔů	ãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹãĄńæÿąãĄŢãĆŇãĄ§åĘĚåőź
çňň1åijŢæŢř	ãĄŞãĆŞãĄńãĄąãĄŕ
çňň2åijŢæŢř	ãČąãĆ£ãČĞãČijãĆ£ãČĘãĆźãČĹ

âĂż åijŢæŢřãĆŠçl'žçŹ¡ãĄğåĹĘéŻćãĄŹãĆŃçĆžãĄńãĂĄspaceèęĄçt'ããĆŠä¡£çŤĺãĄŮãĄęãĄĎãĄ¿ãĄŹãĂĆ

JSONãČĞãČijãĆ£ãĄĺãĄŮãĄęãĄőåŘŰãĆŁæL'śãĄĎæŰź

åŕ¿èl'śAPIãĆşãČijãČńãĄőmetadataãĄĺãĄŮãĄęãĂĄäžëäÿŃãĄőãĆĹãĄĘãĄńJSONãČĞãČijãĆ£ãĄŇäÿŐãĄĹãĆL'ãĆŇãĄ§åät'åŘĹã

```
{
    "locale": "ja-JP",
    "time": "2018-07-01T12:18:45+09:00",
    "topic": "*",
    "utterance": "subagent ãĄŞãĆŞãĄńãĄąãĄŕ",
    "metadata": {"arg1": "value1", "arg2": "value2", "arg3": "value3"}
}
```

metadataãĄŇJSONãĄőåät'åŘĹãĂĄ *json*
ãĆ£ãĆřãĆŠä¡£çŤĺãĄŹãĆŃãĄŞãĄĺãĄğãĂĄJSONå¡ćåijŔãĄőãČĞãČijãĆ£ãĄĺãĄŮãĄęåŘŰãĆŁæL'śãĄĘãĄŞãĄĺãĄŇãĄğãĄ■ãĄ¿ãĄ
JSONãĄőåĂd'ãĆŠåŘŰå¿ŮãĄŮãĄęåĂŃãĂĚãĄńèĺ■åőŽãĄŹãĆŃåät'åŘĹãĄńãĄŕãĂĄ *json*
ãĆ£ãĆřãĄńãĆ■ãČijãĆŠæŇĞåőŽãĄŮãĄęåŕ¿èśąãĄĺãĄŁãĆŃåĂd'ãĆŠåŘŰå¿ŮãĄŮãĂĄãĄİãĄőåĂd'ãĆŠ
sraixãĆ£ãĆř
ãĄőåĘĚåőźãĄĺãĄŮãĄęèĺ■åőŽãĄŹãĆŃãĄŞãĄĺãĄğãĂĄãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹãĄńåijŢãĄ■æÿąãĄŹãĄŞãĄĺãĄŇãĄğãĄ■ã

```
<aiml>
    <!-- sub agent execute -->
    <category>
        <pattern>subagent *</pattern>
        <template>
            <think>
                <sraix service="myService">
                    <star /><space />
                    <json var="__USER_METADATA__.arg1" /><space />
                    <json var="__USER_METADATA__.arg2" /><space />
                    <json var="__USER_METADATA__.arg3" />
                </sraix>
                <set name="departure"><json var="__SUBAGENT__.myService.
↪transportation.station.departure" /></set>
                <set name="arrival"><json var="__SUBAGENT__.myService.
↪transportation.station.arrival" /></set>
            </think>
            <get name="departure"/>ãĄŃãĆL'<get name="arrival"/>
↪ãĄ¿ãĄğãĆŠæd'IJçt'ćãĄůãĄ¿ãĄŹãĂĆ
        </template>
```

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```
    </category>
</aiml>
```

ãČęãČijãĆűçŹžèľśãĄÑãĂŇsubagent ãĄŞãĆŞãĄńãĄąãĄŕãĂ■ãĄőåät'åŘĹãĂĄäżëäÿÑãĄőãĆĹãĄĘãĄńåśŢéŰÑãĄŢãĆÑãĄ§ãČĞãC

åijŢæŢřçŢłåŔů	ãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹãĄńæÿąãĄŢãĆÑãĄ§åĘĚåőź
çňň1åijŢæŢř	ãĄŞãĆŞãĄńãĄąãĄŕ
çňň2åijŢæŢř	value1
çňň3åijŢæŢř	value2
çňň4åijŢæŢř	value3

âĂż åijŢæŢřãĆŠçľžçŹ¡ãĄğåĹĘéŻćãĄŹãĆŃçĆžãĄńãĂĄspaceèęĄçt'äãĆŠä¡£çŤĺãĄŮãĄęãĄĎãĄ¿ãĄŹãĂĆ

11.2.2 ãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹãĄńmetadataåĚĺãĄęãĆŠåijŢãĄ■æÿąãĄŹæŰźæşŢ

åŕ¿èľśAPIãĄÑãĆL'metadataãĄĺãĄŮãĄęæÿąãĄŢãĆÑãĄ§JSONãČĞãČijãĆ£ãĆŠãĂĄãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹãĄńãĄİãĄőãA
json
ãĆ£ãĆřãĄőåśđæĂğãĄń__USER_METADATA__ãĆŠæŇĞåőŽãĄŹãĆÑãĄŞãĄĺãĄğãĂĄmetadataãĄńèĺ■åőŽãĄŢãĆÑãĄ§ãČĞãČijã

```
<aiml>
    <!-- sub agent execute -->
    <category>
        <pattern>subagent *</pattern>
        <template>
            <think>
                <sraix service="myService">
                    <star /><space />
                    <json var="__USER_METADATA__" />
                </sraix>
                <set name=departure><json var="__SUBAGENT__.myService.
↪transportation.station.departure" /></set>
                <set name=arrival><json var="__SUBAGENT__.myService.transportation.
↪station.arrival" /></set>
            </think>
            <get name='departure'>ãĄÑãĆL'<get name='arrival'>
↪ãĄ¿ãĄğãĆŠæd'IJçt'ćãĄŮãĄ¿ãĄŹãĂĆ
        </template>
    </category>
</aiml>
```

ãČęãČijãĆűçŹžèľśãĄÑãĂŇsubagent ãĄŞãĆŞãĄńãĄąãĄŕãĂ■ãĄőåät'åŘĹãĂĄmySer-
viceãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹãĄńår¿ãĄŹãĆÑçňň2åijŢæŢřãĄğæŇĞåőŽãĄŢãĆÑãĄ§JSONãĄÑãĄİãĄőãA¿ãA¿æÿąãĆŁãA¿ã

åijŢæŢřçŢłåŔů	ãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹãĄńæÿąãĄŢãĆÑãĄ§åĘĚåőź
çňň1åijŢæŢř	ãĄŞãĆŞãĄńãĄąãĄŕ
çňň2åijŢæŢř	{âĂŸarg1âĂŹ: âĂŸvalue1âĂŹ, âĂŸarg2âĂŹ: âĂŸvalue2âĂŹ, âĂŸarg3âĂŹ: âĂŸ-value3âĂŹ}

âĂż åijŢæŢřãĆŠçľžçŹ¡ãĄğåĹĘéŻćãĄŹãĆŃçĆžãĄńãĂĄspaceèęĄçt'äãĆŠä¡£çŤĺãĄŮãĄęãĄĎãĄ¿ãĄŹãĂĆ

11.3 år¿èľśAPIãĄńè£ŤãĄŹmetadataãĄőèĺ■åőŽ

år¿èľśAPIãĄőãČňãĆźãČİãČşãĆźãĄńèĺ■åőŽãĄŹãĆŃmetadataèęAçt'ãäĄőæŇĞåőŽãĄŕãĂąãĆůãČŁãČłãĆłãĄőè£Ťå■t'çŤĺãČąãĆ£ã

ãČňãĆźãČİãČşãĆźãĄőmetadataèęAçt'ãäĄńãĄŕãĂąãČĘãĆ■ãĆźãČĹãČĞãČijãĆ£ãĂąãĄ¿ãĄ§ãĄŕãĂĄJSONãČĞãČijãĆ£ãĆŠèĺ■åő

ãČąãĆ£ãČĞãČijãĆ£åd'L'æŢř__SYSTEM_METADATA__ãĄŕãČ■ãČijãĆńãČńåd'L'æŢřiijĹvarïijL'ãĄĺãĄŮãĄęæL'śãĄĎãĄ¿ãĄŹãĄ

11.3.1 ãČĘãĆ■ãĆźãČĹãČĞãČijãĆ£ãĄĺãĄŮãĄęãĄőåŔŰãĆŁæL'śãĄĎæŰź

äžěäÿŇãĄőä¿ŇãĄğãĄŕãĂĄmyServiceãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹãĄŃãĆL'åŔŰå¿ŮãĄŮãĄ§ãČĞãČijãĆ£ãĄőäÿ■ãĄőâĂİåĞžç

ãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹãĄŃãĆL'è£Ťå■t'ãĄŢãĆŇãĄ§JSONãĄŃãĆL'ãĂąåĞžçŹžåIJřïijŽâĂİstation.departureâĂİãĄőèęAçt'

ãĄŞãĆŇãĄńãĆĹãĄčãĄęãĂĄår¿èľśAPIãĄőãČňãĆźãČİãČşãĆźãĄőmetadataèęAçt'ãäĄĺãĄŮãĄęãĂĄãČĘãĆ■ãĆźãČĹãČĞãČijãĆ£ã

```
<aiml>
    <!-- sub agent execute -->
    <category>
        <pattern>subagent *</pattern>
        <template>
            <think>
                <sraix service="myService">
                    <star />
                </sraix>
                <set var="__SYSTEM_METADATA__"><json var="__SUBAGENT__.myService.
↪transportation.station.departure" /></set>
            </think>
            ãČąãĆ£ãČĞãČijãĆ£ãĄńåĞžçŹžåIJřãĆŠèĺ■åőŽãĄŮãĄ¿ãĄŮãĄ§ãĂĆ
        </template>
    </category>
</aiml>
```

Input: subagent æİśäžň
Output: ãČąãĆ£ãČĞãČijãĆ£ãĄńåĞžçŹžåIJřãĆŠèĺ■åőŽãĄŮãĄ¿ãĄŮãĄ§ãĂĆ
metadataãĄőåĘĚåőź: âĂIJæİśäžňâĂİ

11.3.2 JSONãČĞãČijãĆ£ãĄĺãĄŮãĄęãĄőåŔŰãĆŁæL'śãĄĎæŰź

äžěäÿŇãĄőä¿ŇãĄğãĄŕãĂĄmyServiceãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹãĄŃãĆL'åŔŰå¿ŮãĄŮãĄ§JSONãČĞãČijãĆ£ãĆŠãĂąè£Ťå■
json
ãĆ£ãĆřãĄğãĂĄãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹãĄŃãĆL'è£Ťå■t'ãĄŢãĆŇãĄ§JSONãČĞãČijãĆ£åĚĺą¡ŞãĆŠ__SYSTEM_METADA

ãĄŞãĆŇãĄńãĆĹãĄčãĄęãĂĄår¿èľśAPIãĄőãČňãĆźãČİãČşãĆźãĄőmetadataèęAçt'ãäĄĺãĄŮãĄęãĂĄJSONãČĞãČijãĆ£ãĄŇè£Ťå■

```
<aiml>
    <!-- sub agent execute -->
```

(continues on next page)

(continued from previous page)

```
    <category>
        <pattern>subagent *</pattern>
        <template>
            <think>
                <sraix service="myService">
                    <star />
                </sraix>
                <set var="__SYSTEM_METADATA__"><json var="__SUBAGENT__.myService" /
↪></set>
            </think>

↪ãČąãĆ£ãČĞãČijãĆ£ãĄńãĆţãČŰãĆÍãČijãĆÿãĆğãČşãČĹãĄőåĞęçŘĘçţŘæđIJãĆŠèÍ■åőŽãĄŮãĄ¿ãĄŮãĄ§ãĂĆ
        </template>
    </category>
</aiml>
```

Input: subagent æİśäžň

Output:
ãČąãĆ£ãČĞãČijãĆ£ãĄńãĆţãČŰãĆÍãČijãĆÿãĆğãČşãČĹãĄőåĞęçŘĘçţŘæđIJãĆŠèÍ■åőŽãĄŮãĄ¿ãĄŮãĄ§ãĂĆ metadataãĄőåĘĚåőź: {âĂIJtransportationâĂİ: {âĂIJstationâĂİ: {âĂIJdepartureâĂİ: âĂIJæİśäžňâĂİ, âĂIJarrivalâĂİ: âĂIJäžňéČ¡âĂİ}, âĂIJtimeâĂİ: {âĂIJdepartureâĂİ: âĂIJ2018/11/1 11:00âĂİ, âĂIJarrivalâĂİ: âĂIJ2018/11/1 13:30âĂİ}, âĂIJfacility: [âĂIJéź£èŃŚåŕžâĂİ, âĂIJæÿĚæřť åŕžâĂİ, âĂIJäijŔèęŃçĺšè■ůåď ğçď¿âĂİ]}}

éŰćéĂčéăĚçŻő: *åŕ¿èl'śAPI*ãĂĄ *åŕ¿èl'śAPIãČĞãČijãĆ£ãĄőåď'L'æŢřåĹl'çŤĺ*ãĂĄ *JSON*ãĂĄ *SubAgent*

CHAPTER 12

åŕ¿èľśAPIãČĞãČijãĆ£ãĄőåďĽæŢřåĹľçŤĺ

12.1 æęĆèęĄ

åŕ¿èľśAPI ãĄğæŇĞåőŽãĄŢãĆŇãĄ§ãČĞãČijãĆ£ãĄőåĹľçŤĺæŰźæşŢãĆŠèłňæŸŐãĄŮãĄ¿ãĄŹãĂĆ

12.2 åŕ¿èľśAPIãČĞãČijãĆ£ãĄőåďĽæŢř

åŕ¿èľśAPIãĄğäÿŐãĄĹãĆĽãĆŇãĄ§ãČĞãČijãĆ£ãĄŕãĂĄåŕ¿èľśãĆůãČŁãČłãĆłãĄğåĹľçŤĺåŔŕèČ¡ãĄłåďĽæŢřãĄńåśŢéŰŇãĄŮãĄ§
ä£ÍæŇĄæIJ§éŰŞãĄŕãĆŕãČľãĆďãĆćãČşãČĹãĄńãČňãĆźãČÍãČşãĆźãĆŠè£Ťå■ťãĄŹãĆŇãĄ¿ãĄğãĄğãĄŹãĂĆçűŹçűŽãĄŮãĄęåĘĚ
åŕ¿èľśAPIãČłãĆŕãĆÍãĆźãČĹæŹĆãĄńèľšå¡Şåď˙ĽæŢřãĄŇæIJłèĺ■åőŽãĄőåăť˙åŘĹãĂĄâĂŹNoneâĂŹãĄŇè£ŤãĆŁãĄ¿ãĄŹãĂĆ

åŕ¿èľśAPIãČĞãČijãĆ£ãĆŠä£ÍæŇĄãĄŹãĆŇåď˙ĽæŢřåŘ■ãĄŕäÿŃèąĺãĄőãĄĺãĄŁãĆŁãĄğãĄŹãĂĆ

éăĚçŽőåŘ■	åď˙ĽæŢřåŘ■	åđŃ	èłňæŸŐ
ãČ■ãĆśãČijãČń	__USER_LOCALE__	string	åŕ¿èľśAPI `locale` ãĄğæŇĞåőŽãĄŮãĄ§èĺĂèłđãĆşãČijãČĽãĂĆ
æŹĆéŰŞæČĚåăś	__USER_TIME__	string	åŕ¿èľśAPI `time` ãĄğæŇĞåőŽãĄŮãĄ§æŹĆåĹżæČĚåăśãĂĆ
ãČęãČijãĆűID	__USER_USERID__	string	åŕ¿èľśAPI `userId` ãĄğæŇĞåőŽãĄŮãĄ§ãČęãČijãĆűIDãĂĆ
ãČęãČijãĆűçŹžèľś	__USER_UTTERANCE__	string	åŕ¿èľśAPI `utterance` ãĄğæŇĞåőŽãĄŮãĄ§ãČęãČijãĆűçŹžèľśåĘĚåőźãĂĆ
ãČąãĆ£ãČĞãČijãĆ£	__USER_METADATA__	string	åŕ¿èľśAPI `metadata` ãĄğæŇĞåőŽãĄŮãĄ§ãČąãĆ£ãČĞãČijãĆ£ãĂĆåď˙ĽæŢřãĄĺãĄ *json* ãĆ£ãĆŕãĄğåŔŰãĆŁæĽśãĄĘåăť˙åŘĹãĄŕJSONãČĞãČijã

åřŽãĂĄåŘĎåď˙ĽæŢřãĄŕãĆ■ãČijãĆńãČńåď˙ĽæŢřïijĹvarïijĽãĄĺãĄŮãĄęæĽśãĄĐãĄ¿ãĄŹãĄŇãĂĄãČęãČijãĆűæŕÓãĄőçőąçŘĘæČ

ïijĹåŘĎåď˙ĽæŢřåĂď˙ãĆŠãĆůãČŁãČłãĆłãĄğåď˙ĽæŻť˙ãĄŮãĄęåĹľçŤĺãĄŹãĆŇãĄŞãĄĺãĄŕåŔŕèČ¡ãĄğãĄŹãĄŇãĂĄäÿĂéČĺãĄőèę

12.3 åĹľçŤÍä¿Ń

ãĆŕãČľãĆđãĆćãČşãČĹãĄŃãĆĽãĄőåŕ¿èľśAPIãĄğäžëäÿŃãĄőãĆĹãĄĘãĄńãĂĄåŕ¿èľśAPIãČĞãČijãĆ£ãĄŇäÿŐãĄĹãĆĽãĆŇãĄ§

```
{
    "locale": "ja-JP",
    "time": "2018-07-01T12:18:45+09:00",
    "userId": "E8BDF659B007ADA2C4841EA364E8A70308E03A71",
    "topic": "*",
    "utterance": "ãĄŞãĆŞãĄńãĄąãĄŕ",
    "metadata": {"arg1": "value1", "arg2": "value2"}
}
```

ãĆůãČŁãČłãĆŁãĄğãĄőæĽśãĄĎæŰźãĄŕãĂĄäžëäÿŃãĄőãĆĹãĄĘãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

```
<aiml>
    <category>
        <pattern>ãĄŞãĆŞãĄńãĄąãĄŕ</pattern>
        <template>
            <get var="__USER_LOCALE__" /> ,
            <get var="__USER_TIME__" /> ,
            <get var="__USER_USERID__" /> ,
            <get var="__USER_UTTERANCE__" />
        </template>
    </category>
</aiml>
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕ
Output:
ja-JP,2018-07-01T12:18:45+09:00,E8BDF659B007ADA2C4841EA364E8A70308E03A71,ãĄŞãĆŞãĄńãĄąãĄŕ

metadataãĄńãĄďãĄĎãĄęãĄŕãĂĄ *metadata* ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăãĄŢãĄĎãĂĆ

CHAPTER 13

SubAgent

13.1 æęĆèęĄ

ãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹ(SubAgent)ãĄŕãĂĄsraixèęĄçť ăãĆŠä¡£çŤĺãĄŮãĄęåŚijãĄşåĞžãĄŹåď ŰéČĺãĄőãĆţãČijãČŞãĆźãĄ
sraixãĄğæŇĞåőŽãĄŹãĆŇåď ŰéČĺãĆţãČijãČŞãĆźãĄőåŚijãĄşåĞžãĄŮæŰźæşŢãĆŠèłňæŸŐãĄŮãĄ¿ãĄŹãĂĆ

åď ŰéČĺãĆţãČijãČŞãĆźãĄőåŚijãĄşåĞžãĄŮãĄőæŰźæşŢãĄńãĄŕãĂĄæňąãĄőïijŤçĺőéąđãĄŇãĄĆãĆŁãĄ¿ãĄŹãĂĆ

- **æśŐçŤĺRESTãĆď ãČşãĆ£ãČŢãĆğãČijãĆź** åśđæĂğãĄńãĂĄâĂİtemplateâĂİãĆŠæŇĞåőŽãĄŮãĄ§åăť åŘĹãĂĄãĄ¿ãĄ§ãĄ
  APIãĄĺãĄŮãĄęåď ŰéČĺãĆţãČijãČŞãĆźãĆŠåŚijãĄşåĞžãĄŮãĄ¿ãĄŹãĂĆ
- **åŕ¿èľ śãČŮãČľ ãČČãČĹãČŢãĆľ ãČijãČăãĄğãĂĄåĚňéŰŃãĄŢãĆŇãĄęãĄĎãĆŃbotåŚijãĄşåĞžãĄŮ**
  åśđæĂğãĄńãĂĄâĂİbotNameâĂİãĆŠæŇĞåőŽãĄŮãĄ§åăť åŘĹãĂĄåŕ¿èľ śãČŮãČľ ãČČãČĹãČŢãĆľ ãČijãČăãĄğåĚňéŰ
- **NLUéĂŽä£ąãĆď ãČşãĆ£ãČŢãĆğãČijãĆź** åśđæĂğãĄńãĂĄâĂİnluâĂİãĆŠæŇĞåőŽãĄŮãĄ§åăť åŘĹãĂĄæĎŔåŻşèğčéĞĹ
- **ãĆńãĆźãĆ£ãČăåď ŰéČĺãĆţãČijãČŞãĆźåő§èčĚ** åśđæĂğãĄńãĂĄâĂİserviceâĂİãĆŠæŇĞåőŽãĄŮãĄ§åăť åŘĹãĂĄãĆńãĆ
- åśđæĂğ

ãČŚãČľãČąãĆ£ãĆĞ	åđŃ	åĚĚéăĹ	æŸŐ
æIJłæŇĞåőŽ		No	å■ŘèęĄçť ăãĄńãĆĹãĆŃæśŐçŤĺREST APIåŚijãĄşåĞžãĄŮãĂĆ
template	string	No	æśŐçŤĺRESTéĂŽä£ąçŤĺãĄőãČĘãČşãČŮãČňãČijãČĹåŘ■ãĂĆ
botName	string	No	åĚňéŰŃBotéĂŽä£ąçŤĺãĄőãĆĺãĆď ãČłãĆćãĆźåŘ■ãĂĆ
nlu	string	No	NLUéĂŽä£ąçŤĺãĄőãĆĺãĆď ãČłãĆćãĆźåŘ■ãĂĆ
service	string	No	ãĆńãĆźãĆ£ãČăåď ŰéČĺãĆţãČijãČŞãĆźãĄőãĆţãČijãČŞãĆźåŘ■ãĂĆ
default	string	No	åď ŰéČĺåŚijãĄşåĞžãĄŮåď śæŢŮæŹĆãĄőå£IJç■ŤæŰĞãĂĆ
timeout	string	No	éĂŽä£ąãĆ£ãĆď ãČăãĆćãĆęãČĹæŹĆéŰŞïijĹçğŠå■Ÿä¡■ïijĽãĆŠ âĂŸ1âĂŹ äżěäÿŁãĄőæŢť æŢřãĄğæŇĞåőŽãĂĆæIJłæŇĞåőŽæŹĆãĄŕ âĂŸ10âĂŹãĂĆ

SubAgentãĄŃãĆĽãĄőãČňãĆźãČİãČşãĆźãČIJãČĞãĆčãĄŕãĂĄãĆůãČŁãČłãĆł(AIML)ãĄğåĹľçŤĺåŔŕèČ¡ãĄłãČ■ãČijãĆńãČńåď L'
ãČňãĆźãČİãČşãĆźãČIJãČĞãĆčãĄőåĘĚåőźãĄŇJSONãĄőåăť åŘĹãĂĄ *json*
ãĆ£ãĆřãĄğJSONåĘĚéČĺãĄőãČŚãČľ ãČąãČijãĆ£ãĆŠåŔŰå¿ŮãĄğãĄ■ãĄ¿ãĄŹãĂĆ

ãČ■ãČijãĆńãČńåď L'æŢř(var)ãĄńåśŢéŰŃãĄŢãĆŇãĄ§åĘĚåőźãĄŕãĂĄAIMLãĄőcategoryãĄőçŕĎåŻšãĄőãĄ£ãĄğæIJL'åŁźãĄłãĄ§

ãĄ¿ãĄ§ãĂĄcategoryåĘĕãĄğãĂĄèď'ĞæŢřåŻđãĂĄãĆţãČŰãĆĺãČijãĆÿãĆğãČşãČĹãĄőåŚijãĄşåĞžãĄŮãĆŠèąŇãĄčãĄ§åăť'åŘĹãĂ

âĂIJdefaultâĂİåšđæĂğãĄŕïijŢçĺőéąđãĄőåď'ŰéČĺãĆţãČijãČŞãĆźãĄőåŚijãĄşåĞžãĄŮæŰźæşŢãĄńåĚšéĂŽãĄğæŇĞåőŽãĄğãĄ■ãĂ

âĂIJtimeoutâĂİåšđæĂğãĆĆïijŢçĺőéąđãĄőåď'ŰéČĺãĆţãČijãČŞãĆźãĄőåŚijãĄşåĞžãĄŮæŰźæşŢãĄńåĚšéĂŽãĄğæŇĞåőŽãĄğãĄ■ã

13.2 åĚšéĂŽäżŢæğŸ

åŘĎåď'ŰéČĺãĆţãČijãČŞãĆźåŚijãĄşåĞžãĄŮãĄńåĚšéĂŽãĄŹãĆŃæľ§èČ¡ãĄĺãĄŮãĄęãĂĄéĂŽä£ąåď'śæŢŮãĄőæď'IJåĞžãĄĺèęĄåŽ

13.2.1 éĂŽä£ąåď'śæŢŮæŹĆãĄőå£lJç■ŤæŰĞ(default)

éĂŽä£ąåď'śæŢŮæŹĆãĄńãĄŕãĂĄsraixãĄőæĹżãĆŁåĂď'ãĄĺãĄŮãĄęâĂİâĂİïijĹçľ'žæŰĞå■ŮïijL'ãĄŇèĺ■åőŽãĄŢãĆŇãĄ¿ãĄŹãĄŇã

äżěäÿŇãĄŕãĂĄãĆńãĆźãĆ£ãČăåď'ŰéČĺãĆţãČijãČŞãĆźåő§èčĚãĆŠåĹľçŤĺãĄŹãĆŃåăť'åŘĹãĄőä¿ŇãĄğãĄŹãĂĆ

```
<category>
    <pattern>botãĆźãČĘãČijãĆ£ãĆźãČĄãĆğãČČãĆŕ *</pattern>
    <template>
        <star />ãĄőãĆźãČĘãČijãĆ£ãĆźãĄŕãĂĄ<sraix service="someBot" default=
↪"éĂŽä£ąåd'śæŢŮ"><star /></sraix>ãĄğãĄŹãĂĆ
     </template>
</category>
```

Input: botãĆźãČĘãČijãĆ£ãĆźãČĄãĆğãČČãĆŕ åĚňéŰŃbot
Output: åĚňéŰŃbotãĄőãĆźãČĘãČijãĆ£ãĆźãĄŕãĂĄéĂŽä£ąåď'śæŢŮãĄğãĄŹãĂĆ

13.2.2 ãĆ£ãĆď'ãČăãĆćãĆęãČĹæŇĞåőŽ(timeout)

åď'ŰéČĺãĆţãČijãČŞãĆźãĄĺãĄőéĂŽä£ąæŹĆéŰŞãĆŠæŇĞåőŽãĄŢãĆŇãĄ§æŹĆéŰŞãĄğåĹűéŹŘãĄŮãĄ¿ãĄŹãĂĆãĆ£ãĆď'ãČăãĆćã

âĂIJdefaultâĂİåšđæĂğãĆŠæŇĞåőŽãĄŹãĆŇãĄŞãĄĺãĄğãĂĄæŇĞåőŽãĄŢãĆŇãĄ§æŰĞå■ŮåĹŮãĆŠsraixãĄőæĹżãĆŁåĂď'ãĄĺãĄ

æŇĞåőŽãĄŕçğŠå■Ÿä¡■ïijĹçIJĄçŢěåĂď'ïijŽ10çğŠïijL'ãĄğèąŇãĄĐãĄ¿ãĄŹãĄŃãĂĄåŃŢä¡IJçŠřáćČãĄńãĆĹãĄčãĄęãĄŕæŇĞåőŽã

äżěäÿŇãĄŕãĂĄãĆńãĆźãĆ£ãČăåď'ŰéČĺãĆţãČijãČŞãĆźåő§èčĚãĆŠåĹľçŤĺãĄŮãĆ£ãĆď'ãČăãĆćãĆęãČĹãĄŇçŹžçŤ§ãĄŮãĄ§åăť'åŘ

```
<category>
    <pattern>botãĆźãČĘãČijãĆ£ãĆźãČĄãĆğãČČãĆŕ *</pattern>
    <template>
        <star />ãĄőãĆźãČĘãČijãĆ£ãĆźãĄŕãĂĄ<sraix service="someBot" timeout="10">
↪<star /></sraix>ãĄğãĄŹãĂĆ
     </template>
</category>
```

Input: botãĆźãČĘãČijãĆ£ãĆźãČĄãĆğãČČãĆŕ åĚňéŰŃbot
Output: åĚňéŰŃbotãĄőãĆźãČĘãČijãĆ£ãĆźãĄŕãĂĄãĄğãĄŹãĂĆ

13.2.3 HTTPãĆźãČĘãČijãĆ£ãĆźãĆşãČijãČL'ãĄőåŘŰå¿Ů

éĂŽä£ąåd'śæŢŮãĄőèęĄåŻäãĄńãĄŕãĂĄãČŚãČl'ãČąãČijãĆ£ãĄőæŇĞåőŽçŢřåÿÿãĄłãĄl'ãĆŠåŘńãĆĄåŘĎçĺőãĄĆãĆŁãA¿ãĄŹãĄŇ
ãČ■ãČijãĆńãČńåd'L'æŢř(var)ïijŽ __SUBAGENT_STATUS_CODE__ ãĄńãĂĄHTTPãĆźãČĘãČijãĆ£ãĆźãĆşãČijãČL'ãĄőåÄd'ãĄŇ

- åŘŰå¿Ůåd'śæŢŮ : éĂŽä£ąåĞęçŘĘãĄŇèąŇãĆŔãĆŇãĄłãĄŇãĄčãĄ§ãĂĆ
- 000 : éĂŽä£ąèęĄæśĆãĄńåŢŔéąŇãĄŇãĄĆãĆŁéĂŽä£ąãĄŇèąŇãĆŔãĆŇãĄłãĄŇãĄčãĄ§ãĂĄãĄ¿ãĄ§ãĄŕãĂĄéĂŽä£ąçţŘæć
- 001 : éĂŽä£ąãĆ£ãĆd'ãČããĆćãĆęãČĹãĄŇçŹžçŢ§ãĄŮãĄ§ãĂĆ
- 200 : éĂŽä£ąãĄŇæ■čåÿÿãĄńèąŇãĆŔãĆŇãĄ§ãĂĆ
- ãĄİãĄőäżŰ : éĂŽä£ąçţŘæđIJãĄÍãĄŮãĄęãĂĄçŢřåÿÿãĆŠçd'žãĄŹãĆźãČĘãČijãĆ£ãĆźãĆşãČijãČL'ãĄŇéĂŽç§ěãĄŢãĆŇãĄ§ã

äżěäÿŇãĄŕãĂĄRESTéĂŽä£ąãĄőhostãĄńæŐěçűŽãĄğãĄ■ãĄłãĄĐURLãĆŚæŇĞåőŽãĄŮãĄ§åät'åŘĹãĄőä¿ŇãĄğãĄŹãĂĆ

```
<category>
    <pattern>äÿ■æ■čRESTãĆţãČijãČŘæŇĞåőŽ</pattern>
    <template>
        <think>
            <sraix><host>https://otherhost.com:5000</host><body>data</body></sraix>
        </think>
        ãĆźãČĘãČijãĆ£ãĆźãĆşãČijãČL'ãĄŕãĂĄ<get var="__SUBAGENT_STATUS_CODE__" />
↪ãĄğãĄŹ
     </template>
</category>
```

Input: äÿ■æ■čRESTãĆţãČijãČŘæŇĞåőŽ
Output: ãĆźãČĘãČijãĆ£ãĆźãĆşãČijãČL'ãĄŕãĂĄ000ãĄğãĄŹãĂĆ

13.2.4 ãČňãĆd'ãČĘãČşãĆůãĄőåŘŰå¿Ů

åd'ŰéČĺãĆţãČijãČŞãĆźãĄĺãĄőéĂŽä£ąæŹĆéŰŞïijĹãČňãĆd'ãČĘãČşãĆůïijL'ãĄŕåŃŢä¡IJçŠřáćČãĆĎãČ■ãČČãČĹãČŕãČijãĆŕçŁűæş
éĂŽåŘŮä£ąãĄńèęĄãĄŮãĄ§æŹĆéŰŞãĆŠçćžèł■ãĄğãĄ■ãĆŃægŸãĄńãĂĄãČ■ãČijãĆńãČńåd'L'æŢř(var)ïijŽ
__SUBAGENT_LATENCY__
ãĄńãĂĄéĂŽåŘŮä£ąæŹĆéŰŞãĆŠçğŠå■Ÿä¡■ãĄőåřŔæŢřçĆźäżŸãĄ■æŢřåÄd'ãĄğèĺ■åőŽãĄŮãĄ¿ãĄŹãĂĆ

éĂŽä£ąãĄŇèąŇãĆŘãĆŇãĄłãĄŇãĄčãĄ§ãĂĄd'L'æŢřåÄd'ãĄőåŘŰå¿ŮãĄńåd'śæŢŮãĄŮãĄ¿ãĄŹãĂĆ

äżěäÿŇãĄŕãĂĄRESTéĂŽä£ąãĄőhostãĄńéĂŽä£ąãĄğãĄ■ãĄłãĄĐURLãĆŚæŇĞåőŽãĄŮãĄęãĆ£ãĆd'ãČããĆćãĆęãČĹãĄŇçŹžçŢ§ã

```
<category>
    <pattern>éĂŽä£ąãĆ£ãĆd'ãČããĆćãĆęãČĹ</pattern>
    <template>
        <think>
            <sraix timeout="1"><host>https://anyhost.com</host><body>data</body></
↪sraix>
        </think>
        éĂŽä£ąæŹĆéŰŞãĄŕãĂĄ<get var="__SUBAGENT_LATENCY__" />çğŠãĄğãĄŹ
     </template>
</category>
```

Input: éĂŽä£ąãĆ£ãĆd'ãČããĆćãĆęãČĹ
Output: éĂŽä£ąæŹĆéŰŞãĄŕãĂĄ1.010000çğŠãĄğãĄŹãĂĆ

13.3 æśŐçŤÍRESTãĆď'ãČşãĆ£ãČŢãĆğãČijãĆź

sraixãĄőåśđæĂğãĄńâĂİtemplateâĂİãĆŠæŇĞåőŽãĄŮãĄ§åăť'åŘĹãĂąãĄ¿ãĄ§ãĄŕãĂĄåśđæĂğãĄğãĂĄâĂİbotNameâĂİãĂĄâĂİn
å■ŘèęAçť'ăãĄőhost, header, query, bodyç■L'ãĆŠåĽ'çŤÍãĄŮãĄęãĂĄREST
APIãĄÍãĄŮãĄęåď'ŰéČÍãĆţãČijãČŞãĆźãĆŠåŚijãĄşåĞžãĄŮãĄ¿ãĄŹãĂĆ

åśđæĂğãĄńâĂİtemplateâĂİãĆŠæŇĞåőŽãĄŮãĄ§åăť'åŘĹãĄőåĂd'ãĄńãĄŕãĂĄ*rest_templates*
ãČŢãĆąãĆd'ãČńãĄğçŹżéŇšãĄŮãĄ§ãČEãČşãČŮãČňãČijãČĹåŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ

ïijĹçŹżéŇšãĄŢãĆŇãĄęãĄĎãĄłãĄĎãČEãČşãČŮãČňãČijãČĹåŘ■ãĆŠæŇĞåőŽãĄŮãĄ§åăť'åŘĹãĄńãĄŕãĂĄAIMLåśŢéŰŇæŹĆãA

âĂIJtemplateâĂİæŇĞåőŽãĄőåăť'åŘĹãĄńãĆĆå■ŘèęAçť'ăãĄőæŇĞåőŽãĆŠèąÑãĄEãĄŞãĄÍãĄğãĂĄéĂĄä£ąãĄŹãĆŇåĘĚåőźãĆŠå

13.3.1 éĂĄä£ą

- å■ŘèęAçť'ă

| ãČŚãČľãČąãĆĆãĆąãĆĆãĆĆãĆĆ

(continued from previous page)

```
{
    "question": "Ask this question"
}
```

åf¿èl'śAPIãĄğæŇĞåőŽãĄŢãĆŇãĄ§ metadata ãĆŠãČIJãČĞãĆčãĄńæŇĞåőŽãĄŹãĆŃåăt'åŘĹãĄŕãĂAj-sonãĆ£ãĆřãĄğ __USER_METADATA__ ãĆŠåŘŰå¿ŮãĄŮãĂĄå■ŘèęAçt'ăâĂİbodyâĂİãĄńèĺ■åőŽãĄŮãA¿ãĄŹãĂĆ

```
<category>
    <pattern>XXX</pattern>
    <template>
        <sraix>
            <host>https://otherhost.com/ask</host>
            <method>POST</method>
            <query>"userid":"1234567890","q":"question"</query>
            <header>"Authorization":"yyyyyyyyyyyyyyyyy","Content-Type":
↪"application/json;charset=UTF-8"</header>
            <body><json var="__USER_METADATA__" /></body>
        </sraix>
    </template>
</category>
```

13.3.2 ãČĘãČşãČŮãČňãČijãČĹãĆŠä¡£çŤĺãĄŮãĄ§éĂĄä£ą

rest_templatesãČŢãĆąãĆd'ãČńãĄğäžëäÿŇãĄőåőŽç¿l'ãĆŠèąŇãĄčãĄ§åăt'åŘĹãĄőãČĘãČşãČŮãČňãČijãČĹãĄőä¡£çŤĺä¿ŇãĆŠçd'ž

```
rest:
  ãČĘãČşãČŮãČňãČijãČĹ:
    host: 'https://otherhost.com/ask'
    method: POST
    query:  '"item":"1234"'
    header: '"Content-Type": "applicaton/json"'
    body: '{"key": "Send Data"}'
```

sraixãĄőèĺŸè£řãĄğå■ŘèęAçt'ăãĆŠæŇĞåőŽãĄŮãĄłãĄĐåăt'åŘĹãĂĄãČĘãČşãČŮãČňãČijãČĹãĄőåőŽç¿l'åĘĚåőźãĄğéĂĄä£ąãĆŠ

ãČĘãČşãČŮãČňãČijãČĹãĄőåőŽç¿l'ãĆŠçĐąåŁźãĄńãĄŹãĆŃåăt'åŘĹãĂĄsraixãĄőèl'šå¡Şå■ŘèęAçt'ăãĄńçl'žæŰĞå■ŮãĆŠæŇĞåőŽ äžëäÿŇãĄőä¿ŇãĄğãĄŕãĂĄqueryãĆŠçĐąåŁźåŇŰãĄŮãĄęãĄĐãA¿ãĄŹãĂĆ

```
<category>
    <pattern>XXX</pattern>
    <template>
        <sraix template="ãČĘãČşãČŮãČňãČijãČĹ">
            <query></quesy>
        <sraix>
    </template>
</category>
```

éĂĄä£ąåĘĚåőź

```
POST /ask HTTP/1.1
Host: otherhost.com
Content-Type: application/json
```

(continues on next page)

(continued from previous page)

```
{
  "key": "Send Data"
}
```

sraixãĄĝå■ŘèęĄçť´ăăĆŠæŇĞåőŽãĄŮãĄ§åăť´åŘĹãĂąãČĘãČşãČŮãČňãČijãČĹãĄőåőŽç¿l'ãĆĹãĆŁåĎłåĚĹãĄŮãĄęèĺ■åőŽãĄŢãĆ

ãČĘãČşãČŮãČňãČijãČĹãĄőqueryãĂąheaderåőŽç¿l'ãĄÑãĄĆãĆŃåăť´åŘĹãĄńãĂąäÿĂéČĺãĄőãĆ■ãČijãĄőæČĚåăśãĆŠçĎąåŁźãĄ
{år¿èśąãĆ■ãČij: None} ãĆŠèĺ■åőŽãĄŮãĄ¿ãĄŹãĂĆ

bodyãĄńãĄd'ãĄĎãĄęãĄŕãĂąãČĘãČşãČŮãČňãČijãČĹåőŽç¿l'ãĄĺsraixãĄőå■ŘèęĄçť´ăæŇĞåőŽãĄőäÿąæŰźãĄŇJSONå¡ćåijŔãĄő

ãČĘãČşãČŮãČňãČijãČĹåőŽç¿l'ãĄőbodyãĄŇJSONå¡ćåijŔãĄğãĂąäÿĂéČĺãĄőãĆ■ãČijãĆŠéŹd'åd'ŰãĄŮãĄęéĂąä£ąãĄŮãĄ§ãĄĎ
null}
ãĆŠèĺ■åőŽãĄŮãĄ¿ãĄŹãĂĆïijĹçňňäÿĂéŽŐåśd'ãĄőãĆ■ãČijãĄőãĄ£ãĄŇår¿èśąãĄĺãĄłãĆŁãĄ¿ãĄŹïijL'ãĂĆ
åřŽãĂąãČĘãČşãČŮãČňãČijãČĹåőŽç¿l'ãĄĺãĄŮãĄę
hostãĄőæŇĞåőŽãĄŕå£ĚéáĹãĄğãĄŹãĄŇãĂąsraixãĄőèĺŸè£řãĄğç¡õãĄ■æŔŻãĄĹãĆŃãĄŞãĄĺãĄŇãĄğãĄ■ãĄ¿ãĄŹãĂĆ

äžěäÿŃãĄőä¿ŃãĄğãĄŕãĂąhostãĆŠç¡õæŔŻãĄŮãĂąmethodãĄĺãĄĺãĆĆãĄńãĂąqueryãĄőâĂİitemâĂİèęĄçť´ăăĆŠçĎąåŁźåŇŰãĄ

```
<category>
    <pattern>XXX</pattern>
    <template>
        <sraix template="ãČĘãČşãČŮãČňãČijãČĹ">
            <host>https://otherhost.com/ask</host>
            <method></method>
            <query>"item": None, "userid":"1234567890"</query>
            <header>"Authorization":"yyyyyyyyyyyyyyyyy"</header>
            <body>{"key2": "added data"}</body>
        <sraix>
    </template>
</category>
```

éĂąä£ąåĘĚåőź

```
GET /ask?userid=1234567890 HTTP/1.1
Host: otherhost.com
Content-Type: application/json
Authorization: yyyyyyyyyyyyyyyyy

{
  "key": "Send Data", "key2": "added data"
}
```

13.3.3 åŔŮä£ą

åŔŮä£ąçţŘæđIJãĄőãČIJãČĞãĆčåĘĚåőźãĆŠãĂąsraixãĄőçţŘæđIJãĄĺãĄŮãĄęè£ŤãĄŮãĄ¿ãĄŹãĂĆ

AIMLãĄğåĞęçŘĘãĄğãĄ■ãĆŃãĄőãĄŕãČĘãĆ■ãĆźãČĹãĄőãĄ£ãĄłãĄőãĄğãĂąãČŘãĆd'ãČŁãČłãĄőãČIJãČĞãĆčãĄŕãĆţãČİãČijã
åŔŮä£ąçţŘæđIJãĄŕãĂąãČ■ãČijãĆńãČńåd'L'æŢř(var)ïijŽ__SUBAGENT_BODY__
ãĄńãĆĆåśŢéŰŃãĄŮãĄ¿ãĄŹãĂĆ getãĄğãĂą<get var=âĂİ__SUBAGENT_BODY__âĂİ
/>ãĆŠæŇĞåőŽãĄŹãĆŃãĄŞãĄĺãĄğãĂąãČIJãČĞãĆčãĄőæŰĞå■ŮåĹŮãĆŠåŔŰå¿ŮãĄğãĄ■ãĄ¿ãĄŹãĂĆ

ãČ■ãČijãĆńãČńåd'L'æŢř(var)ãĄőåĘĚåőźãĄŕcategoryå■Ÿä¡■ãĄğä£ÏæŇąãĄŢãĆŃãĆŃãĄ§ãĆąãĂąçűŹçűŽãĄŮãĄęãČňãĆźãČİãČ

ãĄ¿ãĄ§ãĂĄcategoryåĘĚãĄğãĂĄèď'ĞæŢřåŻđãĂĄæśŐçŤÍRESTãĆď'ãČşãĆ£ãČŢãĆğãČijãĆźåŚijãĄşåĞžãĄŮãĄ§åăť'åŘĹãĂĄ__
ãĄŕäÿŁæŻÿãĄ■ãĄŢãĆŇãĆŃãĄ§ãĆĄãĂĄå£ĚèęĄãĄłãČňãĆźãČĺãČşãĆźåĘĚåőźãĄŕäżŮãĄőåď'L'æŢřãĄńäžčåĚěãĄŮãĄęãĄŘãĄă

sraixãĄőçţŘæđIJãĄĺãĂĄãČ■ãČijãĆńãČńåď'L'æŢřãĄőæăijçţ'■åĂď'ãĄŕåŘŇãĄŸå¡ćåijŔãĄłãĄőãĄğãĂĄäžěäÿŃãĄőïijŠãĄď'ãĄőèĺŸ

```
<category>
    <pattern>XXX</pattern>
    <template>
        <sraix template="ãČĘãČşãČŮãČňãČijãČĹ" />
    </template>
</category>
```

```
<category>
    <pattern>XXX</pattern>
    <template>
        <think>
            <sraix template="ãČĘãČşãČŮãČňãČijãČĹ" />
        </think>
        <get var="__SUBAGENT_BODY__" />
    </template>
</category>
```

åŘŮä£ąçţŘæđIJãĄőãČIJãČĞãĆčåĘĚåőźãĄŇJSONãĄőåăť'åŘĹãĂĂ *json* ãĆ£ãĆřãĄğJSONåĘĚéČĺãĄőãČŚãČľ'ãČąãČijãČ£ãĆŠåŘŮ

```
{
    "transportation": {
        "station": {
            "departure": "æİśäžň",
            "arrival": "äžňéČ¡"
        },
        "time": {
            "departure": "2018/11/1 11:00",
            "arrival": "2018/11/1 13:30"
        }
    },
    "facility": ["éź£èŃŚåŕž", "æÿĚært'åŕž", "äijŔèęŃçĺšè■ůåd'ğçd'¿"]
 }
```

ãĄĺãĄĎãĄęãČIJãČĞãĆčåĘĚåőźãĄőåăť'åŘĹãĂĄäžěäÿŃãĄőèĺŸè£řãĄğãĂĄJSONãĆ£ãĆřãĄńãĆĹãČŁãČIJãČĞãĆčãĄőåĘĚéČĺæČ

```
<json var="__SUBAGENT_BODY__.transportation.station.departure" />   <!--␣
↪åŘŮå¿ŮçţŘæđIJïijž æİśäžň -->
<json var="__SUBAGENT_BODY__.facility" function="len" />            <!--␣
↪åŘŮå¿ŮçţŘæđIJïijž 3 -->
<json var="__SUBAGENT_BODY__.facility"><index>1</index></json>      <!--␣
↪åŘŮå¿ŮçţŘæđIJïijž æÿĚært'åŕž -->
```

13.4 åŕ¿èľśãČŮãČľãĆČãČĹãČŢãĆľãČijãČãäĄğãĂĄåĚňéŰŃãĄŢãĆŇãĄęãĄĎã

sraixãĄőåśđæĂğãĄńãĂĄâĂİbotNameâĂİãĆŚæŇĞåőŽãĄŮãĄ§åăť'åŘĹãĂĄåŕ¿èľśãČŮãČľ'ãČČãČĹãČŢãĆľ'ãČijãČãäĄğåĚňéŰŃã
åśđæĂğâĂİbotNameâĂİãĄőåĂď'ãĄńãĄŕãĂĄ*bot_names*
ãČŢãĆąãĆď'ãČńãĄğçŹżéŇšãĄŮãĄ§ãĆĺãĆď'ãČłãĆćãĆźåŘ■ãĆŚæŇĞåőŽãĄŮãĄ¿ãĄŹãĄ

sraixãĄőåĘĚåőźãĄŃåĚňéŰŃbotãĄÿãĄőåĚěåŁŻæŰĞ(çŹžèľśæŰĞ)ãĄĺãĄŮãĄęéĂĄä£ąãĄŢãĆŇãĄ¿ãĄŹãĄŇãĂĄåĚěåŁŻæŰĞãĄ

ïijĹçŹżéŇšãĄŢãĆŇãĄęãĄĎãĄłãĄĎãĆĺãČłãĆćãĆźåŘ■ãĆŚæŇĞåőŽãĄŮãĄ§åăť'åŘĹãĄńãĄŕãĂĄAIMLåśŢéŰŃæŹĆãĄńçŢřå

ãĆĺãĆd'ãČłãĆćãĆźåŘ■ãĄőåőŽç¿l'ãĄgåŘĎçĺőãČŚãČl'ãČąãČijãĆ£ãĆŠæŇĞåőŽãĄŮãĄ§åät'åŘĹãĄńãĆĆãĂĄå■ŘèęAçt'ãäĄőæŇĞ
åĚňéŰŃbotãĄŃãĆL'ãĄőæĹżãĄčãĄęãĄŔãĆŃåĘĚåőźãĄŕãĂĄ*år¿èl'śAPI*
ãĄőåŔŮä£ąãČĞãČijãĆ£ãĄgèęŔåőŽãĄŢãĆŇãA§JSONå¡ćåijŔãĄgãĄĆãĆŁãĂĄsraixãĄőæĹżãĆŁåĂd'ãĄńãĂĄãĄİãĄőäÿ■ãĄőresp

13.4.1 éĂĄä£ą

åĚňéŰŃbotåĹl'çŤĺæŹĆãĄõãČŚãČl'ãČąãČijãĆ£ãĄŕå■ŘèęAçt'ãäĄĺãĄŮãĄęèÍŸèijL'ãĄŮãĄ¿ãĄŹãĂĆå■ŘèęAçt'ãäĄőåĘĚåőźãĄŕãĂ
ãĄőãČIJãČĞãĆčãĄőåĘĚåőźãĄĺãĄŮãĄęéĂĄä£ąãĄŢãĆŇãĄ¿ãĄŹãĂĆ
å■ŘèęAçt'ãäĄńãĄd'ãĄĎãĄęãĄŕãĂĄ*år¿èl'śAPI* ãĆŠåŘĆçĚğãĄŮãĄęãĄŔãĄäãĄŢãĄĎãĂĆ

sraixãĄgãĂĄãČęãČijãĆűIDãĄŇæIJłæŇĞåőŽãĄőåät'åŘĹãĂĄår¿èl'śAPIãĄgæŇĞåőŽãĄŢãĆŇãĄ§ãČęãČijãĆűIDãĆŠåijŢãĄ■çűŹã

åĚňéŰŃBotãĆŠåĹl'çŤĺãĄŹãĆŃåät'åŘĹãĂĄsraixãĄńãĄŕãČęãČijãĆűçŹžèl'śãĆŠèĺ■åőŽãĄŹãĆŃå■ŘèęAçt'ãäĄŕãĄłãĄŔãĂĄsraixã

sraixãĄőåĘĚåőźãĄŇçĎąãĄĎïijĹåŘńãĆĂãĂĄçl'žæŰĞå■ŮïijL'ãĄőåät'åŘĹãĂĄåĚňéŰŃBotãĄÿãĄőéĂŽä£ąãĄŕèąŇãĆŔãĆŃãĄŽã

- å■ŘèęAçt'ă

ãČŚãČl'ãČąãČijãĆãĆ£ãĆd'ãČłĚëãĺæŸŐ				
userId		string	No	ãČęãČijãĆűIDãĂĆæIJłæŇĞåőŽãĄőåät'åŘĹãĂĄår¿èl'śAPIãĄőæŇĞåőŽåd'ãĆŠåijŢãĄ■çűŹ
locale		string	No	ãČ■ãĆśãČijãČńãĂĆèĺĂèłđæŇĞåőŽISO-639 èĺĂèłđãĆşãČijãČL'ãĄĺISO-3166 åŽ¡ãĆşãČijãČL'ãĆŠãČŔãĆd'ãČŢãČşçźŇãĄĐãĄăçţĐãĄ£åŘĹãĆŔãĄŽãĆŠæŇĞåőŽãĄŮ
time		string	No	æŹĆéŰŞæČĚåăśãĂĆISO8601(RFC3339)å¡ćåijŔãĄgæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
topic		string	No	ãČĹãČŤãČČãĆŕIDãĂĆtopicæČĚåăśãĆŠåd'L'æŽt'ãĄŹãĆŃåät'åŘĹãĄńãĄőãĄ£æŇĞåőŽãĄŮ
deleteVariable		boolean	No	ãĆ£ãĆźãĆŕåd'L'æŢřåL'ŁéŹd'æŇĞåőŽãĂĆâĂŹtrueâĂŹãĄŇæŇĞåőŽãĄŢãĆŇãĄ§åät'åŘĹãĄ
metadata		string	No	ãČąãĆ£ãČĞãČijãĆ£ãĂĆTextå¡ćåijŔãĂĄãĄ¿ãĄ§ãĄŕãĂĄJSONå¡ćåijŔãĄgæŇĞåőŽãĄŮãĄ¿ã
config			No	ãĆşãČşãČŢãĆčãĆŕæŇĞåőŽãĂĆJSONå¡ćåijŔãĄgæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
	logLevel	string	No	ãČ■ãĆŕãČńãČŹãČńãĂĆâĂŹnoneâĂŹ,âĂŹerrorâĂŹ,âĂŹwarningâĂŹ,âĂŹinfoâĂŹ,âĂŹdebu

userIdäžěåd'ŰãĄőå■ŘèęAçt'ãäĄŇæIJłæŇĞåőŽãĄőåät'åŘĹãĂĄèl'šå¡ŞãĄõèęAçt'ãäĄŕéĂĄä£ąãĄŢãĆŇãĄ¿ãĄŻãĆŞãĂĆ

sraixãĄőåĞęçŘĘåő§èąŇæŹĆãĄńå■ŘèęAçt'ãäĄőäÿ■æ■čãĆŠæd'IJåĞžãĄŮãĄ§åät'åŘĹãĄńãĄŕãĂĄåĞęçŘĘä¿Ńåd'ŰãĄŇçŹžçŤ§ã
ïijĹä¿Ńåd'ŰçŹžçŤ§æŹĆãĄőå£IJç■ŤæŰĞãĄŕãĂĄ*properties* ãĄő `exception-response`
ãĄgæŇĞåőŽãĄgãĄ■ãĄ¿ãĄŹãĂĆïijL'

äžěäÿŃãĄőä¿ŃãĄŕãĂĄuserId, topicãĂĄdeleteVariableãĂĄmetadataãĂĄconfigãĆŠãĆůãČŁãĆłãĄgæŇĞåőŽãĄŮãĂĄlocaleãĂ
åřŽãĂĄ*bot_names* ãČŢãĆąãĆd'ãČńãĄgãĄŕãĂĄURLãĄĺapikeyãĄőãĄ£ãĆŠæŇĞåőŽãĄŮãĄ§åät'åŘĹãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

```
bot:
  someBot:
    url: https://somebot.com/bots/botId_1/ask
    apikey: test_apikey
```

```
<category>
    <pattern>botãĆźãČĘãČijãĆ£ãĆźãČĄãĆğãČČãĆŕ *</pattern>
    <template>
        <think>
            <json var="askSubagent.éČţä¿£çŢłåŔů">222-0033</json>
            <json var="config.logLevel">debug</json>
```

(continues on next page)

(continued from previous page)

```
        </think>
        <sraix botName="someBot">
            <star />
            <userId>someUser</userId>
            <topic>test</topic>
            <deleteVariable>true</deleteVariable>
            <metadata><json var="askSubagent"/></metadata>
            <config><json var="config"/></config>
        </sraix>
    </template>
</category>
```

Input: botãĆźãČĘãČijãĆ£ãĆźãČĄãĆğãČČãĆŕ éČţä¿£çŢłåŔůæd'IJçt'ć
Output: æŰřæĺłæţIJ

éĂĄä£ąåĘĚåőź

```
POST /bots/botId_1/ask HTTP/1.1
Host: somebot.com
Content-Type: application/json;charset=UTF-8
x-api-key: test_apikey

{
    "userId": "someUser",
    "topic": "test",
    "deleteVariable": true,
    "metadata": {"éČţä¿£çŢłåŔů": "222-0033"},
    "config": {"logLevel": "debug"},
    "utterance": "éČţä¿£çŢłåŔůæd'IJçt'ć"
}
```

13.4.2 bot_namesãĄğãČŚãČľãČąãČijãĆ£ãĆŠèĺ■åőŽãĄŮãĄ§åăťåŘĹãĄőéĂĄä£ą

bot_namesãČŢãĆąãĆd'ãČńãĄğäžěäÿŇãĄőåőŽç¿l'ãĆŠèąŇãĄčãĄ§åăťåŘĹãĄőéĂĄä£ąä¿ŇãĆŠçd'žãĄŮãĄ¿ãĄŹãĂĆ

```
bot:
  someBot:
    url: https://somebot.com/bots/botId_1/ask
    locale: ja-JP
    time: 2018-07-01T12:18:45+09:00
    topic: test
    deleteVariable: false
    config: '("loglevel": "info"}'
    metadata: Send Data
```

sraixãĄőèĺŸè£řãĄğå■ŘèęAçt'ăăĆŠæŇĞåőŽãĄŮãĄłãĄĎåăť'åŘĹãĂĄbot_namesãĄőåőŽç¿l'åĘĚåőźãĄğéĂĄä£ąãĆŠèąŇãĄĎãĄ¿ã

bot_namesãĄőåőŽç¿l'ãĆŠçĎąåŁźãĄńãĄŹãĆŃåăť'åŘĹãĂĄsraixãĄőèl'šå¡Şå■ŘèęAçt'ăãĄńçl'žæŰĞå■ŮãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹã

äžěäÿŇãĄőä¿ŇãĄğãĄŕãĂĄtimeãĂĄtopicãĆŠçĎąåŁźåŇŰãĄŮãĄęãĄĎãĄ¿ãĄŹïijĹdeleteVariableãĄŕâĂŹfalseâĂŹãĄőãĄ§ãĆĄéĂ

åŕŽãĂĄuserIdãĄŕbot_namesãĄğãĄŕèĺ■åőŽãĄğãĄ■ãĄłãĄĎãĄ§ãĆĄãĂĄåŃåĹěãĄńæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ(çIJAçŢěæŹĆãĄń
__USER_USERID__ ãĄőåĂd'ãĆŠä¡£çŤĺãĄŮãĄ¿ãĄŹãĂĆ)

```
<category>
    <pattern>XXX</pattern>
    <template>
        <sraix botName="someBot">
            <userId>someUser</userId>
            <time></time>
            <topic></topic>
            ãĄŞãĆŞãĄńãĄąãĄŕ
        <sraix>
    </template>
</category>
```

éĂĄä£ąåĘĚåőź

```
POST /bots/botId_1/ask HTTP/1.1
Host: somebot.com
Content-Type: application/json;charset=UTF-8
x-api-key:

{
    "userId": "someUser",
    "locale": "ja-JP",
    "config": {"logLevel": "info"},
    "utterance": "ãĄŞãĆŞãĄńãĄąãĄŕ",
    "metadata": "Send Data"
}
```

sraixãĄğå■ŘèęAçť'ăăĆŠæŇĞåőŽãĄŮãĄ§åăť'åŘĹãĂĄbot_namesãĄőåőŽç¿l'ãĆĹãĆŁåĎłåĚĹãĄŮãĄęèĺ■åőŽãĄŢãĆŇãĄ¿ãĄŹãĂĆ

metadataãĄńãĄd'ãĄĎãĄęãĄŕãĂĄbot_namesåőŽç¿l'ãĄĺsraixãĄőå■ŘèęAçť'ăæŇĞåőŽãĄőäÿąæŰźãĄŇJSONå¡ćåijŔãĄőåăť'åŘĹãA

bot_namesåőŽç¿l'ãĄőmetadataãĄŇJSONå¡ćåijŔãĄğãĂĄäÿĂéČĺãĄőãĆ■ãČijãĆŠéŹd'åd'ŰãĄŮãĄęéĂĄä£ąãĄŮãĄ§ãĄĎåăť'åŘĹã
çŻť'åĂd':âĂŹnullâĂŹ
ãĆŠèĺ■åőŽãĄŮãĄ¿ãĄŹãĂĆïijĹçňňäÿĂéŽŐåśd'ãĄőãĆ■ãČijãĄőãĄ£ãĄŇår¿èśąãĄĺãĄłãĆŁãĄ¿ãĄŹïijL'ãĂĆ

äžëäÿŇãĄőä¿ŇãĄğãĄŕãĂĄtopicãĄĺdeleteVariableãĆŠç¡őæŔŻãĄŮãĂĄmetadataãĆŠçůĺéŻĘãĄŮãĄ§åĂd'ãĆŠéĂĄä£ąãĄŮãĄęãĄĹ

åřŽãĂĄmetadataãĄńéŰćãĄŹãĆŃJSONçţŘåŘĹåĞęçŘĘä¿ŇãĆŠçd'žãĄŹãĄ§ãĆĄãĂĄåL'■è£řãĄőbot_namesåőŽç¿l'ãĄőmetadataã

```
metadata: '{"key1":"value1", "key2": "value2", "key3": "value3"}'
```

```
<category>
    <pattern>XXX</pattern>
    <template>
        <sraix botName="someBot">
            <userId>someUser</userId>
            <topic>test</topic>
            <deleteVariable>true</deleteVariable>
            <metadata>{"key1": null, "key2": {"modify": "data"}, "key4": "added"}</
↪metadata>
            ãĄŞãĆŞãĄńãĄąãĄŕ
        </sraix>
    </template>
</category>
```

éĂĄä£ąåĘĚåőź

```
POST /bots/botId_1/ask HTTP/1.1
Host: somebot.com
Content-Type: application/json;charset=UTF-8
x-api-key:

{
    "userId": "someUser",
    "locale": "ja-JP",
    "time": "2018-07-01T12:18:45+09:00",
    "topic": "test",
    "deleteVariable": true,
    "config": {"logLevel": "info"},
    "utterance": "ãĄŞãĆŞãĄńãĄąãĄŕ",
    "metadata": {"key2":{"modify": "data"}, "key3": "value3", "key4": "added"}
}
```

13.4.3 åŔŮä£ą

åĚňéŰŃBotãĄŃãĆĽãĄőåŔŮä£ąãĄŮãĄ§ãČIJãČĞãĆč(JSONå¡ćåijŔ)ãĄőäÿ■ãĄő
responseèęAçţ'ããĄŃãĂĄsraixãĄőæĹżãĆŁåĂd'ãĄĺãĄŮãĄęèĺ■åőŽãĄŢãĆŇãĄ¿ãĄŹãĂĆ
åŔŮä£ąãĄŮãĄ§ãČIJãČĞãĆčãĄŃJSONå¡ćåijŔĄĞãĄłãĄĎãĂĄJSONåĘĚãĄń respon-
seèęAçţ'ããĄŃçĎąãĄĎåăţ'åŘĹãĄńãĄŕåĚňéŰŃBotãĄĺãĄőéĂŽä£ąãĄĺãĄŮãĄęçŢřåÿÿãĄĺãĄŮãĂĄåśđæĂğïijŽdefaultãĄŃæIJłèĺ■åĉ

äżěäÿŇãĄőãĆůãČŁãČłãĆłãĄĞãĂĄ

```
<category>
     <pattern>*</pattern>
     <template>
        <sraix botName="someBot"><star /></sraix>
     </template>
</category>
```

åĚňéŰŃBotïijŽsomeBotãĄŃãĆĽãĄőåŔŮä£ąãČĞãČijãĆ£ãĄŃ

```
HTTP/1.1 200 Ok
Content-Type: application/json;charset=UTF-8

{
    "response": "ãĄŞãĆŞãĄńãĄąãĄŕãĂĄäżŁæŮěãĆĆãĄĎãĄĎåd'l'ærŮãĄĞãĄŹãĄ■ãĂĆ",
    "topic": "greeting"
}
```

ãĄăãĄčãĄ§åăţ'åŘĹãĂĄçţŘæđIJãĄŕãĂĄ

Input: ãĄŞãĆŞãĄńãĄąãĄŕ
Output: ãĄŞãĆŞãĄńãĄąãĄŕãĂĄäżŁæŮěãĆĆãĄĎãĄĎåd'l'ærŮãĄĞãĄŹãĄ■ãĂĆ

ãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

åĚňéŰŃBotãĄŃãĆĽãĄőåŔŮä£ąåĘĚåőźãĄŕãĂĄãČ■ãČijãĆńãČńåd'L'æŢř(var)
__SUBAGENT_EXTBOT__.ãĆĺãĆd'ãČłãĆćãĆźåŘ■
ãĄńJSONå¡ćåijŔãĄĞåśŢéŰŃãĄŢãĆŇãĂĄjsonãĆ£ãĆřãĄĞåŔŰå¿ŮãĄŹãĆŇãĄŞãĄĺãĄŃãĄĞãĄ■ãĄ¿ãĄŹãĂĆ

åřŽãĂĄèl'šå¡Şåd'L'æŢřãĄŕcategoryå■Ÿä¡■ãĄńä£ÌæŇĄãĄŢãĆŇãĆŇãĄ§ãĆĄãĂĄçűŹçűŽåĹl'çŤĺãĄőåăţ'åŘĹãĄŕãĂĄãĆřãČ■ãČijã

ãĄ¿ãĄ§ãĂĄcategoryåĘĕãĄğãĂĄèď´ĞæŢřåŻđãĂĄåĔňéŰŃBotãĆŠåŚijãĄşåĞžãĄŮãĄ§åăť´åŘĹãĂĄ__SUBAGENT_EXTBOT__
ãĄŕäýŁæŻÿãĄ■ãĄŢãĆŇãĆŃãĄ§ãĆĄãĂĄå£ĚèęĄãĄłãČňãĆźãČĺãČşãĆźåĘĚåőźãĄŕäżŰãĄőåď´L'æŢřãĄńäžčåĚěãĄŮãĄęãĄŔãĄă

```
<category>
     <pattern>*</pattern>
     <template>
        <think>
            <sraix botName="someBot"><star /></sraix>
        </think>
        <json var="__SUBAGENT_EXTBOT__.someBot" />
     </template>
</category>
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕ
Output: {âĂIJresponseâĂİ: âĂIJãĄŞãĆŞãĄńãĄąãĄŕãĂĄäżŁæŮěãĆĆãĄĎãĄĎåď´l'ærŮãĄğãĄŹãĄ■ãĂĆâĂİ,
âĂIJtopicâĂİ: âĂIJgreetingâĂİ}ãĂĆ

getãĆ£ãĆřãĄğåŔŰå¿ŮãĄŹãĆŃåăť´åŘĹãĄńãĄŕãĂĄåď´L'æŢřåŘ■ãĄőãĄ£ãĆŠæŇĞåőŽãĄŹãĆŃå£ĚèęĄãĄŇãĄĆãĆŁãĂĄçňňäÿĂé
åL'■è£řãĄőjsonãĆ£ãĆřãĆŠgetãĆ£ãĆřãĄńåď´L'æŻť´ãĄŹãĆŃãĄĺãĂĄäžěäÿŃãĄőæğŸãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

```
<get var="__SUBAGENT_EXTBOT__" />
```

Input: ãĄŞãĆŞãĄńãĄąãĄŕ
Output: {âĂIJsomeBotâĂİ: {âĂIJresponseâĂİ:
âĂIJãĄŞãĆŞãĄńãĄąãĄŕãĂĄäżŁæŮěãĆĆãĄĎãĄĎåď´l'ærŮãĄğãĄŹãĄ■ãĂĆâĂİ, âĂIJtopicâĂİ:
âĂIJgreetingâĂİ}}ãĂĆ

åĔňéŰŃBotãĄŃãĆL'ãĄőåŘŮä£ąãČIJãČĞãĆčãĄőåĘĚåőźãĄŕJSONãĄőãĄ§ãĆĄãĂĄ
json ãĆ£ãĆřãĄğJSONåĘĚéČĺãĄőãČŠãČľ´ãČąãČijãĆ£ãĆŠåŘŮå¿ŮãĄğãĄ■ãĄ¿ãĄŹãĂĆ
ãĄ¿ãĄ§ãĂĄmetadata ãĄőåĘĚåőźãĄŃJSONãĄğãĄĆãĆŃåăť´åŘĹãĂĄJSONãĆ£ãĆřãĄğ metadata
åĘĚãĄőãČŠãČľ´ãČąãČijãĆ£ãĆĆåŘŮå¿ŮãĄğãĄ■ãĄ¿ãĄŹãĂĆ

åĔňéŰŃBotãĄŃãĆL'ãĄőãČIJãČĞãĆčãĄőåĘĚåőźãĄŃãĂĄ

```
{
    "utterance": "ãĄŞãĆŞãĄńãĄąãĄŕ",
    "response": "ãĄŞãĆŞãĄńãĄąãĄŕãĂĄäżŁæŮěãĆĆãĄĎãĄĎåd'l'ærŮãĄğãĄŹãĄ■ãĂĆ",
    "topic": "greeting"
    "metadata":{"broadcaster":"OBS","title":"å■Ĺå¿ŇãĄőãČŃãČěãČijãĆź"}
}
```

ãĄőåăť´åŘĹãĂĄ

```
<json var="__SUBAGENT_EXTBOT__.someBot.response" />              <!--␣
↪åŘŰå¿ŮçţŘædIJïijž ãĄŞãĆŞãĄńãĄąãĄŕãĂĄäżŁæŮěãĆĆãĄĎãĄĎåd'l'ærŮãĄğãĄŹãĄ■ãĂĆ -->
<json var="__SUBAGENT_EXTBOT__.someBot.utterance" />             <!--␣
↪åŘŰå¿ŮçţŘædIJïijž ãĄŞãĆŞãĄńãĄąãĄŕ -->
<json var="__SUBAGENT_EXTBOT__.someBot.topic" />                 <!--␣
↪åŘŰå¿ŮçţŘædIJïijž greeting -->
<json var="__SUBAGENT_EXTBOT__.someBot.metadata" />              <!--␣
↪åŘŰå¿ŮçţŘædIJïijž {"broadcaster":"OBS","title":"å■Ĺå¿ŇãĄőãČŃãČěãČijãĆź"} -->
<json var="__SUBAGENT_EXTBOT__.someBot.metadata.broadcaster" />  <!--␣
↪åŘŰå¿ŮçţŘædIJïijž OBS -->
```

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(continued from previous page)

```
<json var="__SUBAGENT_EXTBOT__.someBot.metadata.title" />        <!--␣
↪åŔŮå¿ŮçţŘæđIJïijž å■Ĺå¿ÑãĄőãČŃãČěãČijãĆź -->
```

ãĄĺãĄŮãĄęãĂĄåĚňéŰŃbotãĄŃãĆL'ãĄőæĹżãĆŁåĂd'ãĂĄåŔŁãĄşãĂĄmetadataãĄőæČĚåăśãĆŠåŔŮå¿ŮãĄŹãĆŃãĄŞãĄĺãĄŃãA

ïijĹãČĞãČŘãČČãĆřæČĚåăśïijL'

ãĂĂåĚňéŰŃBotãĄŃãĆL'ãĄőåŔŮä£ąãČĞãČijãĆ£å¡ćåijŔãĄŃäÿ■æ■čãĄłåăt'åŘĹãĄńãĄŕéĂŽä£ąçŢřåÿÿãĄĺãĄŮãĄęæL'śãĄĐãA¿ã
ãĆĺãĆd'ãČłãĆćãĆźåŘ■
ãĄńæăijçţ'■ãĄŮãA¿ãĄŹãĂĆ

13.5 NLUéĂŽä£ąãĆd'ãČşãĆ£ãČŢãĆğãČijãĆź

sraixãĄőåśđæĂğãĄńãĂĄâĂInluâĂIãĆŠæŇĞåőŽãĄŮãA§åăt'åŘĹãĂĄæĐŔåŽşèğčéĞĹãĆĺãČşãĆÿãČşïijĹNLUãĆţãČijãČŘïijL'ãĆŠ
åśđæĂğâĂInluâĂIãĄőåĂd'ãĄńãĄŕãĂĄ*nlu_servers*
ãČŢãĆąãĆd'ãČńãĄğçŹżéŇšãĄŮãA§ãĆĺãĆd'ãČłãĆćãĆźåŘ■ãĆŠæŇĞåőŽãĄŮãĂĄsraixãĄőåĘĚåőźãĆŠNLUãĆţãČijãČŘãĄÿãĄőål

ïijĹçŹżéŇšãĄŢãĆŇãĄęãĄĐãĄłãĄĐãĆĺãĆd'ãČłãĆćãĆźåŘ■ãĆŠæŇĞåőŽãĄŮãA§åăt'åŘĹãĄńãĄŕãĂĄAIMLåśŢéŰŃæŹĆãĄńçŢřå
NLUãĆţãČijãČŘãĄŃãĆL'ãĄőæĹżãĄčãĄęãĄŔãĆŃåĘĚåőźãĄŕãĂĄ*æĐŔåŽşèğčéĞĹãĆĺãĆşãĆÿãĆşäžŢæğŸ*
ãĄğèęŔåőŽãĄŢãĆŇãA§JSONå¡ćåijŔãĄğãĄĆãĆŁãĂĄsraixãĄőæĹżãĆŁåĂd'ãĄńãĂĄJSONå¡ćåijŔãĄőãČĞãČijãĆ£ãĆŠè£ŤãĄŮã

äžěéŹ■ãĄőèłňæŸŐãĄğãĄŕãĂĄNLUãĆţãČijãČŘãĄŃãĆL'äžěäÿŃãĄőJSONå¡ćåijŔãĄőãČĞãČijãĆ£ãĄŇè£Ťå■t'ãĄŢãĆŇãA§ä¿Ńã

```
{
    "intents": [
        {"intent": "transportation", "score": 0.9}
    ],
    "slots": [
        {"slot": "departure", "entity": "æİśäžň", "score": 0.85}
    ]
}
```

ãA¿ãA§ãĂĄnlu_serversãĄőåőŽç¿l'ãĄŕäžěäÿŃãĄőãĆĆãĄőä¡£çŤĺãĄŹãĆŃãĆĆãĄőãĄĺãĄŮãA¿ãĄŹãĂĆ

```
servers:
  someNlu:
    url: https://***.com/run
    apikey: test_key
```

13.5.1 éĂĄä£ą

NLUéĂŽä£ąãĆŠåĹl'çŤĺãĄŹãĆŃåăt'åŘĹãĂĄsraixãĄńãĄŕãČęãČijãĆűçŹžèl'śãĆŠèĺ■åőŽãĄŹãĆŃå■ŘèęAçt'ãäĄŕãĄłãĄŘãĂĄsraix

sraixãĄőåĘĚåőźãĄŃçĎąãĄĐïijĹåŘńãĆĂãĂĄçl'žæŰĞå■ŮïijL'ãĄőåăt'åŘĹãĂĄNLUãĄÿãĄőéĂŽä£ąãĄŕèąŇãĆŘãĆŃãĄŽãĂĄåśđ
äžěäÿŃãĄŕãĂĄNLUåŚijãĄşåĞžãĄŮæŹĆãĄőåŃŢä¡IJä¿ŃãĄğãĄŹãĂĆ

```
<category>
    <pattern>nluéĂŽä£ą *</pattern>
```

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```
    <template>
        <sraix nlu="someNlu"><star /></sraix>
     </template>
</category>
```

éĂAä£ąåĘĚåőź

```
POST /run HTTP/1.1
Host: someNlu.com
Content-Type: application/json;charset=UTF-8
x-api-key: test_key

{
    "utterance": "ãĄŁåĞžãĄŃãĄŚãĄź"
}
```

Input: nluéĂŽä£ą ãĄŁåĞžãĄŃãĄŚãĄź
Output: {âĂIJintentsâĂİ: [{âĂIJintentâĂİ: âĂIJtransportationâĂİ, âĂIJscoreâĂİ: 0.9 }], âĂIJslotsâĂİ: [{âĂIJslotâĂİ: âĂIJdepartureâĂİ, âĂIJentityâĂİ: âĂIJæİśäžñâĂİ, âĂIJscoreâĂİ: 0.85}]}ãĂĆ

13.5.2 åŔŮä£ą

éĂAä£ąæŹĆãĄőä¿ŃãĄğçd'žãĄŮãĄ§éĂŽãĆŁãĂĄNLUãĆţãČijãČŘãĄŃãĆĽåŔŮä£ąãĄŮãĄ§ãČIJãČĞãĆč(JSONå¡ćåijŔ)ãĄŃãĂ

åŔŮä£ąãĄŮãĄ§ãČIJãČĞãĆčãĄŃJSONå¡ćåijŔãĄğãĄłãĄĎåăt'åŘĹãĄfNLUãĄĺãĄőéĂŽä£ąãĄĺãĄŮãĄęçŢřåÿÿãĄĺãĄŮãĂĄåśđæĂ

NLUãĄŃãĆĽãĄőåŔŮä£ąåĘĚåőźãĄŕãĂĄãČ■ãČijãĆńãČńåd'Ľ'æŢř(var)
__SUBAGENT_NLU__.ãĆĺãĆd'ãČłãĆćãĆźåŘ■
ãĄńJSONå¡ćåijŔãĄğåśŢéŮŃãĄŢãĆŃãĂĄjsonãĆ£ãĆřãĄğåŔŮå¿ŮãĄŹãĆŃãĄŞãĄĺãĄŃãĄğãĄ■ãĄ¿ãĄŹãĂĆ

åřŽãĂĄèl'šå¡Şåd'Ľ'æŢřãĄŕcategoryå■Ÿä¡■ãĄńä£İæŇĄãĄŢãĆŃãĆŃãĄ§ãĆĄãĂĄçűŹçűŽåĹl'çŤĺãĄőåăt'åŘĹãĄŕãĂĄãĆřãČ■ãČijã

ãĄ¿ãĄ§ãĂĄcategoryåĘĚãĄğãĂĄèd'ĞæŢřåŻđãĂĄåĚňéŰŃBotãĆŠåŚijãĄşåĞžãĄŮãĄ§åăt'åŘĹãĂĄ__SUBAGENT_NLU__
ãĄŕäÿŁæŻÿãĄ■ãĄŢãĆŃãĆŃãĄ§ãĆĄãĂĄå£ĚèęĄãĄłãČňãĆźãČĺãČşãĆźåĘĚåőźãĄŕäžŰãĄőåd'Ľ'æŢřãĄńäžčåĚĚãĄŮãĄęãĄŔãĄăã

```
<category>
     <pattern>*</pattern>
     <template>
        <think>
            <sraix nlu="someNlu"><star /></sraix>
        </think>
        <json var="__SUBAGENT_NLU__.someNlu" />
     </template>
</category>
```

Input: ãĄŁåĞžãĄŃãĄŚãĄź
Output: {âĂIJintentsâĂİ: [{âĂIJintentâĂİ: âĂIJtransportationâĂİ, âĂIJscoreâĂİ: 0.9 }], âĂIJslotsâĂİ: [{âĂIJslotâĂİ: âĂIJdepartureâĂİ, âĂIJentityâĂİ: âĂIJæİśäžñâĂİ, âĂIJscoreâĂİ: 0.85}]}ãĂĆ

getãĆ£ãĆřãĄgåŔŰå¿ŮãĄŹãĆŃåät'åŘĹãĄńãĄŕãĂĄåd'L'æŢřåŘ■ãĄőãĄ£ãĆŠæŇĞåőŽãĄŹãĆŃå£ËèęĄãĄŇãĄĆãĆŁãĂĄçňñäÿĂé
åL'■è£řãĄőjsonãĆ£ãĆřãĆŠgetãĆ£ãĆřãĄńåd'L'æŻt'ãĄŹãĆŃãĄĺãĂĄäžëäÿŃãĄőægŸãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

```
<get var="__SUBAGENT_NLU__" />
```

Input: ãĄŁåĞžãĄŇãĄŚãĄŕ
Output: {âĂIJsomeNluâĂİ: {âĂIJintentsâĂİ: [{âĂIJintentâĂİ: âĂIJtransportationâĂİ, âĂIJscoreâĂİ: 0.9 }],
âĂIJslotsâĂİ: [{âĂIJslotâĂİ: âĂIJdepartureâĂİ, âĂIJentityâĂİ: âĂIJæĺśäžňâĂİ, âĂIJscoreâĂİ: 0.85}]}}ãĂĆ

NLUãĄŇãĆL'ãĄőåŔŰä£ąãČIJãČĞãĆčãĄőåĘĚåőźãĄŕJSONãĄőãĄ§ãĆĄãĂĄ *json*
ãĆ£ãĆřãĄgJSONåĘĚéČĺãĄőãČŚãČľãČąãČijãĆ£ãĆŚåŔŰå¿ŮãĄgãĄ■ãĄ¿ãĄŹãĂĆ

```
<json var="__SUBAGENT_NLU__.someNlu.intents" />            <!-- åŔŰå¿ŮçţŘædIJïijŽ␣
↪[{"intent": "transportation", "score": 0.9}] -->
<json var="__SUBAGENT_NLU__.someNlu.intents" index="0" />   <!-- åŔŰå¿ŮçţŘædIJïijŽ
↪{"intent": "transportation", "score": 0.9} -->
<json var="__SUBAGENT_NLU__.someNlu.slots" />               <!-- åŔŰå¿ŮçţŘædIJïijŽ␣
↪[{"slot": "departure", "entity": "æĺśäžň", "score": 0.85}] -->
<json var="__SUBAGENT_NLU__.someNlu.slots" index="0" />     <!-- åŔŰå¿ŮçţŘædIJïijŽ
↪{"slot": "departure", "entity": "æĺśäžň", "score": 0.85} -->
```

ïijĹãČĞãČŘãČČãĆřæČĚåäśïijL'

ãĂĂNLUãĄŇãĆL'ãĄőåŔŰä£ąãČĞãČijãĆ£å¡ćåijŔãĄŇäÿ■æ■čãĄłåät'åŘĹãĄńãĄŕéĂŽä£ąçŢřåÿÿãĄĺãĄŮãĄęæL'śãĄĐãĄ¿ãĄŹãĄ
ãĆĺãĆd'ãČłãĆćãĆźåŘ■
ãĄńæäijçt'■ãĄŮãĄ¿ãĄŹãĂĆ

13.5.3 nluintent / nluslotãĄgãĄőãČĞãČijãĆ£åŔŰå¿Ů

NLUãĆţãČijãČŘãĄŇãĆL'ãĄőåŔŰä£ąãĄŮãĄ§ãČĞãČijãĆ£ãĆŠãĂĄtemplateèęĄçt'ăãĄő *nluintent*
ãĂĄ*nluslot* ãĆŠåĹl'çŤĺãĄŮãĄęãĂĄ ãČđãČČãČĄåĞęçŘĘãĄgåŔŰå¿ŮãĄŮãĄ§NLUãČĞãČijãĆ£ïijŽ
__SYSTEM_NLUDATA__ ãĄńår¿ãĄŹãĆŃåĞęçŘĘãĄĺåŘŇægŸãĄőæŞ■ä¡IJãĆŠèąŇãĄĘãĄŞãĄĺãĄŇãĄgãĄ■ãĄ¿ãĄŹãĂĆ

äžëäÿŃãĄńãĂĄNLUãĆţãČijãČŘãĄŇãĆL'åŔŰä£ąãĄŮãĄ§ãČĞãČijãĆ£ãĄńår¿ãĄŮãĄęãĂĄnluintentãĄgåĘĚåőźãĆŠåŔŰå¿ŮãĄŹã

```
<nluintent name="*" item="count" target="__SUBAGENT_NLU__.someNlu" />                 ␣
↪    <!-- åŔŰå¿ŮçţŘædIJïijŽ 1 -->
<nluintent name="*" item="intent" index="0" target="__SUBAGENT_NLU__.someNlu" />      ␣
↪    <!-- åŔŰå¿ŮçţŘædIJïijŽ transportation -->
<nluintent name="transportation" item="score" target="__SUBAGENT_NLU__.someNlu" />␣
↪    <!-- åŔŰå¿ŮçţŘædIJïijŽ 0.9 -->
```

åŘŇægŸãĄńãĂĄnluslotãĄgåĘĚåőźãĆŠåŔŰå¿ŮãĄŹãĆŃä¿ŃãĄŕäžëäÿŃãĄőægŸãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

```
<nluslot name="*" item="count" target="__SUBAGENT_NLU__.someNlu" />                 ␣
↪ <!-- åŔŰå¿ŮçţŘædIJïijŽ 1 -->
<nluslot name="*" item="slot" index="0" target="__SUBAGENT_NLU__.someNlu" />        ␣
↪ <!-- åŔŰå¿ŮçţŘædIJïijŽ departure -->
<nluslot name="departure" item="entity" target="__SUBAGENT_NLU__.someNlu" />        ␣
↪ <!-- åŔŰå¿ŮçţŘædIJïijŽ æĺśäžň -->
```

åřŽãĂĄ *nluintent* ãĂĄ*nluslot* ãĄgãĂĄJSONåđŃãĄőåd'L'æŢřåŘ■ïijĹåŇžåĹĞãĆŁæŰĞå■ŮïijŽâĂŹ.âĂŹ
ãĆŠåĹl'çŤĺïijL'ãĆŠæŇĞåőŽãĄgãĄ■ãĆŃãĄőãĄŕãĂĄ ãČ■ãČijãĆńãČńåd'L'æŢř(var) ãĄő
__SUBAGENT_NLU__.xxx ãĄőå¡ćåijŔãĄőåät'åŘĹãĄőãĄ£ãĄgãĄŹãĂĆ

13.6 ãĆńãĆźãĆ£ãČăåďŰéČĺãĆţãČijãČŞãĆźåő§èčĚ

åśđæĂğãĄńãĂĄâĂİserviceâĂİãĆŠæŇĞåőŽãĄŮãĄ§åăťåŘĹãĂĄãĆńãĆźãĆ£ãČăåő§èčĚãĆŠèąŇãĄłãĄčãĄ§åĞęçŘĘãĆŠåĽ'çŤĺãĄ
ãĆńãĆźãĆ£ãČăåď ŰéČĺãĆţãČijãČŞãĆźãĄŕãĂĄåĽ'çŤĺãĄŹãĆŃãĆţãČijãČŞãĆź(SubAgent)æŕŐãĄńåő§èčĚãĄŃå£ĚèęãĄłåŚijãĄ

```
programy.services.service.Service
```

åĞęçŘĘãĆŕãČľãĆźãĄőåő§èčĚãĄğãĄŕãĂĄå§žåžŢãĆŕãČľãĆźãĆŠçűŹæĽ£ãĄŮãĄ§ãĆŕãČľãĆźãĆŠä¡IJæĹŘãĄŮãĂĄask_question
åď ŰéČĺãĆţãČijãČŞãĆźãĄÍãĄőéĂčæŘžãĆŠèąŇãĄĘåăťåŘĹãĂĄask_question()åĘĚãĄńãĂĄRESTéĂŽä£ąæĽ§èČ¡ãĆŠåő§èčĚãĄŹ

```python
from programy.services.service import Service

class StatusCheck(Service):
    __metaclass__ = ABCMeta

    def __init__(self, config: BrainServiceConfiguration):
        self._config = config

    @property
    def configuration(self):
        return self._config

    def load_additional_config(self, service_config):
        pass

    @abstractmethod
    def def ask_question(self, client_context, question: str):
        return "OK"
```

æňąãĄńãĂĄBrainãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşãĄő *services* ãĄńãĂĄæňąãĄőãĆĹãĄĘãĄńãĆńãĆźãĆ£ãČăåď ŰéČĺãĆţãĆ

```
myService:
    classname: programy.services.myService.StatusCheck
    url: https://myService.com/api/statuscheck
```

AIMLãĄğåĽ'çŤĺãĄŹãĆŃåăťåŘĹãĄńãĄŕãĂĄäżěäÿŃãĄőä¿ŃãĄőãĆĹãĄĘãĄńãĂĄsraixãĄőåśđæĂğâĂİserviceâĂİãĄńãĂĄãĆńãĆ
sraixãĄőãĆńãĆźãĆ£ãČăåď ŰéČĺãĆţãČijãČŞãĆźãĄőåĞęçŘĘãĄĺãĄŮãĄęãĄŕãĂĄãĆńãĆźãĆ£ãČăåď ŰéČĺãĆţãČijãČŞãĆźãĄőãĆĺãĆ
éŰćæŢřijŽask_question()ãĄőæĹżãĆŁåĂď ãĄŇãĂĄsraixãĄőçţŘæđIJãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

```
<category>
    <pattern>ãĆźãČĘãČijãĆ£ãĆźãČĄãĆğãČČãĆŕ *</pattern>
    <template>
        <star />ãĄőãĆźãČĘãČijãĆ£ãĆźãĄŕãĂĄ<sraix service="mySerivce"><star /></
↪sraix>ãĄğãĄŹãĂĆ
    </template>
</category>
```

Input: ãĆźãČĘãČijãĆ£ãĆźãČĄãĆğãČČãĆŕ ãĆńãĆźãĆ£ãČă
Output: ãĆńãĆźãĆ£ãČăãĄőãĆźãČĘãČijãĆ£ãĆźãĄŕOKãĄğãĄŹãĂĆ

13.6.1 ãĆńãĆźãĆ£ãČăåď ŰéČĺãĆţãČijãČŞãĆźãĄÿãĄőåijŢæŢřãĄŁãĆĹãĄşæĹżãĆŁåĂď

åijŢæŢř

sraix service=âĂİmyServiceâĂİãĄŇãĆńãĆźãĆ£ãČăåď ŰéČĺãĆţãČijãČŞãĆźåŚijãĄşåĞžãĄŮãĄğãĂĄsraixèęĄçťăåĘĚãĆŠåijŢæŢřã
åijŢæŢřãĄőåőŽç¿l'ãĄŕåĂŃãĂĚãĄőãĆńãĆźãĆ£ãČăåď ŰéČĺãĆţãČijãČŞãĆźãĄőåijŢæŢřI/FãĄń¿Ìå■ŸãĄŮãĄęãĄŁãĆŁãĂĄåĂŃã

äžëäÿÑãĄőä¿ÑãĄŕmyServiceãĄÍãĄÐãĄĘåď ŰéČÍãĆţãČijãČŞãĆźãĆŠåĹľçŤÍãĄŹãĆŃä¿ÑãĄğãĂĄåijŢæŢř4ãĄď ãĆŠçľžçŹ¡åŇžåÍ

åřŽãĂĄæŮěæIJñèłđãĄőåăť åŘĹãĂĄsraixèęĄçť ăãĄőåĘĚåőźãĄŇåĚÍãĄęçţŘåŘĹãĄŢãĆŃãĄęçľžçŹ¡åŇžåĹĞãĆŁãĄńãĄłãĆL'ãĄłã
spaceèęĄçť ă ãĆŠæŇĞåőŽãĄŮãĄęãĄÐãĄ¿ãĄŹãĂĆ

```
<aiml>
    <!-- sub agent execute -->
    <category>
        <pattern>subagent *</pattern>
        <template>
            <set var="text">
                <sraix service="myService">
                    <star />
                    <space />
                    <json var="__USER_METADATA__.arg1" />
                    <space />
                    <json var="__USER_METADATA__.arg2" />
                    <space />
                    <json var="__USER_METADATA__.arg3" />
                </sraix>
            </set>
            <think>
                <set name="departure"><json var="__SUBAGENT__.myService.
↪transportation.station.departure" /></set>
                <set name="arrival"><json var="__SUBAGENT__.myService.
↪transportation.station.arrival" /></set>
            </think>
            <get name="departure">ãĄŃãĆL'<get name="arrival">
↪ãĄ¿ãĄğãĆŠæd'IJçt'ćãĄŮãĄ¿ãĄŹãĂĆ
        </template>
    </category>
</aiml>
```

æĹżãĆŁåĂď

ãĆńãĆźãĆ£ãČãåď ŰéČÍãĆţãČijãČŞãĆźãĄőæĹżãĆŁåĂď ãĂĄãĄď ãĄ¿ãĆŁãĂĄåĂŃåĹěåő§èčĚãĄőask_question()éŰćæŢřãĄőæĹż
__SUBAGENT__.ãĆţãČijãČŞãĆźåŘ■ ãĄńåśŢéŰŃãĄŢãĆŃãĄ¿ãĄŹãĂĆ

èľšå¡Şåď L'æŢřãĄŕcategoryå■Ÿä¡■ãĄńä£ÍæŇĄãĄŢãĆŃãĆŃãĄ§ãĆĄãĂĄçűŹçűŽåĹľçŤÍãĄőåăť åŘĹãĄŕãĂĄãĆřãČ■ãČijãČŘãČńå

ãĄ¿ãĄ§ãĂĄcategoryåĘĚãĄğãĂĄèď ĞæŢřåŻđãĂĄãĆńãĆźãĆ£ãČåď ŰéČÍãĆţãČijãČŞãĆźãĆŠåŚijãĄşåĞžãĄŮãĄ§åăť åŘĹãĂĄ__
ãĄŕäÿŁæŻÿãĄ■ãĄŢãĆŃãĆŃãĄ§ãĆĄãĂĄå£ĚèęĄãĄłãČñãĆźãČÍãČşãĆźåĘĚåőźãĄŕäżŰãĄőåď L'æŢřãĄńäžčåĚěãĄŮãĄęãĄŔãĄăã

åď L'æŢřãĄńæăijçť■ãĄŢãĆŃãĆŃå¡ćåijŔãĄŕãĂĄãČĘãĆ■ãĆźãČĹãĂĄãĄ¿ãĄ§ãĄŕãĂĄJSONå¡ćåijŔãĄÍãĄłãĆŁãĂĄãĆńãĆźãĆ£ãČ

äžëäÿÑãĄőä¿ÑãĄğãĄŕãĂĄmyServiceãĄńåŕ¿ãĄŹãĆŃåĞęçŘĘãĄőæĹżãĆŁåĂď ãĄŇ __SUBAGENT__.
myService ãĄńåśŢéŰŃãĄŢãĆŃãĄęãĄÐãĄ¿ãĄŹãĄŇãĂĄãĄÍãĄőåĘĚåőźãĄŇJSONå¡ćåijŔãĄğãĂĄ

```
{
    "transportation": {
        "station": {
            "departure" :"æÍśäžň",
            "arrival" : "äžňéČ¡"
        },
        "time": {
```

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```
            "departure": "2018/11/1 11:00",
            "arrival": "2018/11/1 13:30"
        },
        "facility": ["éź£èŃŠåŕž", "æÿĚæřt’åŕž", "äijŔèęŃçÍšè■ůåd’ğçd’¿"]
    }
}
```

ãĄőåăť’åŘĹãĂĄ

```
<json var="__SUBAGENT__.myService.transportation.station.departure" />
<json var="__SUBAGENT__.myService.transportation.station.arrival" />
```

ãĄÍãĄŮãĄęãĂĄjsonãĆ£ãĆřãĆŠåĹľçŤÍãĄŮãĄęãĂĄãČIJãČĞãĆčãĄőåĘĚéČÍæČĚåăśãĆŠåŔŰå¿ŮãĄŹãĆŃãĄŞãĄÍãĄŇãĄğãĄ■ãA

ãĆńãĆźãĆ£ãČăåď’ŰéČÍãĆţãČijãČŞãĆźãĄőæĹżãĆŁåĂď’ãĄŇãČĘãĆ■ãĆźãČĹãĄőåăť’åŘĹãĂĄ__SUBAGENT__.
myService
ãĆŠåď’L’æŢřåŘ■ãĄÍãĄŮãĄęãĂĄgetãĆ£ãĆřãĄğåŔŰå¿ŮãĄŹãĆŃãĄŞãĄÍãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

âĂżsraixãĄőçţŘæđIJãČĞãČijãĆ£ãĄőåĞęçŘĘæŰźåijŔãĆŠçţśäÿĂãĄŹãĆŃèęşçĆźãĄŃãĆL’ãĂĄãĆńãĆźãĆ£ãČăåő§èčĚãĄńãĄŁãĄ

```
<get var="__SUBAGENT__.myService />
```

éŰćéĂčéăĚçŻő: *metadata*, *åŕ¿èl’śAPI*, *JSON*

CHAPTER 14

Extensions

14.1 æęĆèęĄ

ExtensionsãĄĺãĄŕãĂĄæŃąåijţæľ§èČ¡ãĆŠåĂŃåĹěãĄńåő§èčĚãĄŹãĆŃãĄ§ãĆĄãĄőæľ§èČ¡ãĄğãĂĄtemplateãĄőextensionèęĄçţ'ă

14.2 ãĆńãĆźãĆ£ãČăăĆĺãĆŕãĆźãČĘãČşãĆůãČğãČşãĄőåő§èčĚ

ãĆńãĆźãĆ£ãČăăĆĺãĆŕãĆźãČĘãČşãĆůãČğãČşãĄőåő§èčĚãĆŕãČľãĆźãĄğãĄŕãĂĄäżëäÿŃãĄőå§žåžŢãĆŕãČľãĆźãĆŠçűŹæĽ£ãĄŹã

```
programy.extensions.base.Extension
```

æňąãĄńåő§èčĚä¿ŃãĆŠçd'žãĄŮãĄ¿ãĄŹãĂĆ
ãĆĺãĆŕãĆźãČĘãČşãĆůãČğãČşãĄőåĞęçŘĘãĆŠåő§èąŇãĄŹãĆŃãČąãĆ¡ãČČãČĽãĄŕ `execute()`
ãĄğãĂĄãĆĺãĆŕãĆźãČĘãČşãĆůãČğãČşãĄőãĆŕãČľãĆźãĄńãĄŕãĂĄ`context` ãĄĺ `data`
ãĆŠåijŢæŢřãĄĺãĄŮãĄ§executeãČąãĆ¡ãČČãČĽãĆŠåő§èčĚãĄŮãĄ¿ãĄŹãĂĆ
`context`
ãĄńãĄŕãĂĄãĆŕãČľãĆd'ãĆćãČşãČĹãĊżãČęãČijãĆűæŕÕãĄőçőąçŘĘæČĚåăšãĆŠæăijçţ'■ãĄŮãĄ§ClientContextãĆŕãČľãĆźïijĹprog
`data` ãĄńãĄŕãĂĄextensionãĆ£ãĆŕãĄőåĘĚåőźãĄŇæŰĞå■ŮåĹŮãĄğèĺ■åőŽãĄŢãĆŃãĄ¿ãĄŹãĂĆ

äžëäÿŃãĄŕãĂĄæŢřåĂd'æijŤçőŮãĆŠèąŇãĄĘãĆńãĆźãĆ£ãČăăĆĺãĆŕãĆźãČĘãČşãĆůãČğãČşãĄőä¿ŃãĄğãĄŹãĂĆ

```
# programy/extensions/calc.py

from programy.extensions.base import Extension

class CalcExtension(Extension):

    def execute(self, context, data):
        try:
            result = str(eval(data))
            return result
```

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```
        except Exception:
            return None
```

AIMLãĄğãĆńãĆźãĆ£ãČäãĆĺãĆřãĆźãČĘãČşãĆůãČğãČşãĆŠåĹľçŤĺãĄŹãĆŃåăť åŘĹãĂĄäžëäÿŃãĄőæğŸãĄńextensionèęAçť ăăĆŠ

AIMLãĄőextensionèęAçť ăăĄőåĞęçŘĘãĄĺãĄŮãĄęãĄŕãĂĄpathåśđæĂğãĄğæŇĞåőŽãĄŢãĆŃãĄ§ãĆřãČľãĆźãĆŠãČ■ãČijãČL'ãĄ
ãĆŠåŚijãĄşåĞžãĄŮãĄ¿ãĄŹãĂĆ
execute() ãĄőæĹżãĆŁåĂd'ãĄŇãĂĄexten-
sionèęAçť ăăĄőçţŘædIJãĄńãĄłãĆŁãĄ¿ãĄŹãĄõãĄğãĂĄæĹżãĆŁåĂd'ãĄńãĄŕæŰĞå■ŮåĹŮãĆŠèĺ■åőŽãĄŹãĆŃå£Ëèę ĄãĄŇãĄĆã

ãĄłãĄŁãĂĄpathåśđæĂğãĄğæŇĞåőŽãĄŢãĆŃãĄ§ãĆřãČľãĆźãĄõãČ■ãČijãČL'åd'śæŢŮãĆĎãĂĄexecute()
åĞęçŘĘãĄńçŢřåÿÿãĄŇãĄĆãĆŃåăť åŘĹãĂĄår¿èľśãĆĺãČşãĆÿãČşãĄŕåĞęçŘĘäÿ■ãĄőä¿Ńåd'ŰçŹžçŢ§ãĄĺãĄŮãĄęæL'śãĄĎãĄ¿ãĄ
(å£IJç■ŤæŰĞåőŽç¿l'ãĄő *exception_response* ãĄŇæŇĞåőŽãĄŢãĄęãĄĎãĆŃåăť åŘĹãĂĄæŇĞåőŽãĄőæŰĞå■ŮåĹŮãĄŇè£ŤãĆŁã

```
<category>
    <pattern>
        æijŤçőŮ *
    </pattern>
    <template>
         çţŘædIJãĄŕãĂĄ
         <extension path="programy.extensions.calc.CalcExtension">
             <star />
         </extension>
         ãĄğãĄŹãĂĆ
    </template>
</category>
```

Input: æijŤçőŮ 1 + 2 * 3 / 4 - 5
Output: çţŘædIJãĄŕãĂĄ-2.5ãĄğãĄŹãĂĆ

ãĄŞãĄőåăť åŘĹãĂĄexecute() ãĄődataåijŢæŢřãĄńãĄŕ <star /> ãĄőåśŢéŰŃæŰĞå■ŮåĹŮãĄĺãĄŮãĄęãĂĄâĂŸ1
+ 2 * 3 / 4 - 5âĂŹ ãĄŇåijŢãĄ■æÿąãĄŢãĆŃãĄ¿ãĄŹãĂĆ

14.3 ãĆůãČŁãČłãĆłåd'L'æŢřãĄőåĹľçŤĺ

ãĆńãĆźãĆ£ãČäãĆĺãĆřãĆźãČĘãČşãĆůãČğãČşåő§èąŇæŹĆãĄńåijŢæŢřãĄĺãĄŮãĄęéĂŽç§ëãĄŢãĆŃãĆŃãĆřãČľãĆd'ãĆćãČşãČĹãČ

åŘĎåd'L'æŢřãĄŕår¿èľśåĘĚåőźãĄńãĆĹãĆŁåd'L'åŃŢãĄŹãĆŃçĆžãĂĄãĆřãČľãĆd'ãĆćãČşãČĹãČżãČęãČijãĆűæŕŐãĄőår¿èľśæČĚ

```
def execute(self, context, data):

    conversation = context.bot.get_conversation(context)
```

år¿èľśæČĚåäśãĆŠåŔŰå¿ŮãĄŹãĆŃãĄŞãĄĺãĄğãĂĄåd'L'æŢřåĘĚåőźãĄőåŔĆçĚğãĆĎãĂĄèĺ■åőŽãĆŠèąŇãĄĘãĄŞãĄĺãĄŃåŔŕèČ¡ã
get ãĄőèĺŸè£řãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄäãĄŢãĄĎãĂĆ

ãĄłãĄŁãĂĄåŘĎåd'L'æŢřãĄőåĂd'ãĄŕæŰĞå■ŮåĹŮå¡ćåijŔãĄğæäijçţ'■ãĄŢãĆŃãĄęãĄĎãĄ¿ãĄŹãĂĆJSONå¡ćåijŔãĄőãČĞãČijãĆ

- åŔŰå¿ŮæŹĆïijŽ <JSONåd'L'æŢřïijŽè¿đæŻÿåđŃ> = json.loads(<ãĆůãČŁãČłãĆłåd'L'æŢř:æŰĞå■ŮåĹŮåđŃ>)

- æăijçť■æŹĆïijŽ <ãĆůãČŁãČłãĆłåď'L'æŢř:æŰĞå■ŮåĹŮåđŃ> = json.dumps(<JSONåď'L'æŢřïijŽè¿đæŻÿåđŃ>, ensure_ascii=False)

14.3.1 çűŹçűŽä£ÌæŇĄãĆřãČ■ãČijãČŘãČńåď'L'æŢř(name)ãĄőåĹľçŤÍ

nameåď'L'æŢřãĄŕãĂĄåŕ¿èľśæČĚåăśåĘĚãĄő properties ãĄńè¿đæŻÿãČĞãČijãĆ£ãĄÍãĄŮãĄęæăijçť■ãĄŢãĆŇãĄęãĄĐãĄ¿ãĄ

```
name_list = conversation.properties                    #␣
↪åď'L'æŢřïijĹè¿đæŻÿïijL'ãČłãĆźãČĹãĄőåŔŰå¿Ů
get_value = conversation.proprty('åď'L'æŢřåŘ■')              #␣
↪äżżæĎŔåď'L'æŢřåĂd'ãĄőåŔŰå¿Ů
set_value = conversation.set_property('åď'L'æŢřåŘ■', 'åĂd'')  #␣
↪äżżæĎŔåď'L'æŢřãĄőè£¡åŁããČżåď'L'æŻt'
remove = conversation.set_property('åď'L'æŢřåŘ■', âĂŹâĂŹ)       #␣
↪äżżæĎŔåď'L'æŢřãĄőåL'ŁéŹd'ïijĹåĂd'ãĄńçl'žæŰĞå■ŮãĆŠæŇĞåőŽïijL'
```

14.3.2 æŇĞåőŽçŕĎåŽšä£ÌæŇĄãĆřãČ■ãČijãČŘãČńåď'L'æŢř(data)ãĄőåĹľçŤÍ

dataåď'L'æŢřãĄŕãĂĄåŕ¿èľśæČĚåăśåĘĚãĄő data_properties ãĄńè¿đæŻÿãČĞãČijãĆ£ãĄÍãĄŮãĄęæăijçť■ãĄŢãĆŇãĄęãĄĐã

```
data_list = conversation.data_properties                    #␣
↪åď'L'æŢřïijĹè¿đæŻÿïijL'ãČłãĆźãČĹãĄőåŔŰå¿Ů
get_value = conversation.data_proprty('åď'L'æŢřåŘ■')              #␣
↪äżżæĎŔåď'L'æŢřåĂd'ãĄőåŔŰå¿Ů
set_value = conversation.set_data_property('åď'L'æŢřåŘ■', 'åĂd'')  #␣
↪äżżæĎŔåď'L'æŢřãĄőè£¡åŁããČżåď'L'æŻt'
remove = conversation.set_data_property('åď'L'æŢřåŘ■', âĂŹâĂŹ)       #␣
↪äżżæĎŔåď'L'æŢřãĄőåL'ŁéŹd'ïijĹåĂd'ãĄńçl'žæŰĞå■ŮãĆŠæŇĞåőŽïijL'
```

14.3.3 ãČ■ãČijãĆńãČńåď'L'æŢř(var)ãĄőåĹľçŤÍ

varåď'L'æŢřãĄŕ category内■Ÿä¡■ãĄőåĞęçŘĘåĘĚãĄğãĄőãĄ£æIJL'åŁźãĄłåď'L'æŢřãĄőãĄ§ãĆĄãĂĄåŕ¿èľśæČĚåăśãĄńãĄŁãĄĐãĄ _properties ãĄńè¿đæŻÿãČĞãČijãĆ£ãĄÍãĄŮãĄęæăijçť■ãĄŢãĆŇãĄęãĄĐãĄ¿ãĄŹãĂĆ æŞ■ä¡IJãĆŠèąŇãĄĘãĄ§ãĆĄãĄńãĄŕãĂĄäžëäÿŇãĄőæğŸãĄńãĂĄçŔ¿åIJĺåĞęçŘĘäÿ■ãĄő question ãĆŕãČl'ãĆźãĆŠåŔŰå¿ŮãĄŮãĄ§äÿŁãĄğæŞ■ä¡IJéŰćæŢřãĆŠä¡£çŤÍãĄŮãĄ¿ãĄŹãĂĆ

```
question = conversation.current_question()

var_list = question._properties                    #␣
↪åď'L'æŢřïijĹè¿đæŻÿïijL'ãČłãĆźãČĹãĄőåŔŰå¿Ů
get_value = question.proprty('åď'L'æŢřåŘ■')              #␣
↪äżżæĎŔåď'L'æŢřåĂd'ãĄőåŔŰå¿Ů
set_value = question.set_property('åď'L'æŢřåŘ■', 'åĂd'')  #␣
↪äżżæĎŔåď'L'æŢřãĄőè£¡åŁããČżåď'L'æŻt'
remove = question.set_property('åď'L'æŢřåŘ■', âĂŹâĂŹ)       #␣
↪äżżæĎŔåď'L'æŢřãĄőåL'ŁéŹd'ïijĹåĂd'ãĄńçl'žæŰĞå■ŮãĆŠæŇĞåőŽïijL'
```

14.3.4 botåŽžæIJL'ãČŮãČ■ãČŚãČĘãĆčãĄőåŔŰå¿Ů

botåŽžæIJL'ãĄőãČŮãČ■ãČŚãČĘãĆčïijĹåŽžåőŽåĂď'ïijL'ãĄőåŔŰå¿ŮãĄńãĄŕãĂĄäžëäÿŇãĄőæŞ■ä¡IJéŰćæŢřãĆŠä¡£çŤÍãĄŮãĄ¿ãĄ

```
bot_property = conversation.bot.brain.properties.property('ãČŮãČ■ãČŚãČĘãĆčåŘ■')
```

CHAPTER 15

OOB

OOB(Out of Band) ãĄŕãĂĄåŃŢçŽĎãĄńãČ■ãČijãČL'ãĄŢãĆŇãĆŃãĆŕãČľãĆźãĄÍAIM-LãĄőoobèęAçť'ăãĄğæŇĞåőŽãĄŹãĆŃOOBæľ§èČ¡ãĄőåŘ■çğřãĄõçţĎãĄ£åŘĹãĆŔãĄŻãĄğåő§çŔ¿ãĄŮãĄ¿ãĄŹãĂĆä¡£çŤĺãĄŹãĆŃOOBæľ§èČ¡æŕŐãĄńãĂĄPythonãĆŕãČľãĆźãĆŠåő§èčĚãĄŮãĂĄãĆşãČşãČŢãĆčãĆŕãČňãČijãĆůãČğãČşãĄő *OOBèĺ■åőŽ* ãĄğãĂĄäžëäÿŇãĄőæğŸãĄńæľ§èČ¡åŘ■ãĄĺéŰćéĂčäżŸãĄŠãĆŠèąŇãĄĘå£ĖèęĄãĄŇãĄĆãĆŁãĄ¿ãĄŹãĂĆ

ãČŚãČľãČąãČijãĆ■åőŽ■ŸŐ		
OOBãĄőåŘ■çğř		ãĄŞãĄőéăĚçŽõãĄńèĺ■åőŽãĄŮãĄ§åŘ■çğřãĄŇãĂĄAIMLãĄğæŇĞåőŽãĄŹãĆŃOOBåŘ
	classname	åő§èčĚãĆŠèąŇãĄĘOOBãĄőpythonãĄõãĆŕãČľãĆźãČŚãĆźãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ

OOBãĄőåő§èčĚå§žåžŢãĆŕãČľãĆźãĄŕæňąãĄõãĆĹãĄĘãĄńåőŽç¿ľãĄŢãĆŇãĄęãĄĎãĄ¿ãĄŹãĂĆ

```
# programy/oob/defaults/oob.py

import xml.etree.ElementTree as ET

class OutOfBandProcessor(object):

    def __init__(self):
        self._xml = None

    # Override this method to extract the data for your command
    # See actual implementations for details of how to do this
    def parse_oob_xml(self, oob: ET.Element):
        self._xml = oob
        return True

    # Override this method in your own class to do something
    # useful with the command data
    def execute_oob_command(self, client_context):
        raise NotImplementedError()

    def process_out_of_bounds(self, client_context, oob: ET.Element):
        if self.parse_oob_xml(oob) is True:
            return self.execute_oob_command(client_context)
        return ""
```

éŻżå■ŘãČąãČijãČńãĆŠéĂąä£ąãĄŹãĆŃOOBæľ§èČ¡ãĄŇãĄĆãĆŃåăť'åŘĹãĂĄOOBãĆŠåĹľçŤĺãĄŹãĆŃAIMLãĄŕæňąãĄõãĆĹãĄ

```
<oob>
    <email>
        <to>åőŻåĚĹ</to>
        <subject>äżűåŘ■</subject>
        <body>æIJňæŰĞ</body>
    </email>
</oob>
```

ãĄŞãĄőåät'åŘĹãĂĄOOBãĄőåĞęçŘĘãĆřãČl'ãĆźãĄńæÿąãĄŢãĆŇãĆŃåijŢæŢřãĄfäżëäÿŃãĄőXMLãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

```
<oob>
    <to>åőŻåĚĹ</to>
    <subject>äżűåŘ■</subject>
    <body>æIJňæŰĞ</body>
</oob>
```

åő§èčĚãĆřãČl'ãĆźãĄfæňąãĄőãĆĹãĄĘãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ parse_oob_xml()ãČąãĆ¡ãĆČãČL'ãĄğAIMLãĄőoobèęAçt'ããĄğæŇ

```
# programy/oob/email/email.py

from programy.oob.defaults.oob import OutOfBandProcessor

class EmailOutOfBandProcessor(OutOfBandProcessor):

    def __init__(self):
        OutOfBandProcessor.__init__(self)
        self._to = None
        self._subject = None
        self._body = None

    def parse_oob_xml(self, oob: ET.Element):
        for child in oob:
            if child.tag == 'to':
                self._to = child.text
            elif child.tag == 'subject':
                self._subject = child.text
            elif child.tag == 'body':
                self._body = child.text
            else:
                logging.error ("Unknown child element [%s] in email oob"%(child.
↪tag))

            if self._to is not None and \
                self._subject is not None and \
                self.body is not None:
                return True

            logging.error("Invalid email oob command")
            return False

    def execute_oob_command(self, client_context):
        logging.info("EmailOutOfBandProcessor: Emailing=%s", self._to)
        return ""
```

OOBæl'§èČ¡ãĆŠåĹl'çŤĺãĄŹãĆŃãĄ§ãĆĄãĄőåőŽç¿l'ãĄĺãĄŮãĄęãĂĄãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşãĄğäżëäÿŃãĄőèĺ■åő

```
oob:
    email:
        classname: programy.oob.email.email.EmailOutOfBandProcessor
```

OOBãĄőèl'şçt'řèĺ■åőŽæŰźæşŢãĄfãĂĄ *OOBãĄőèĺ■åőŽ* ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăãĄŢãĄĎãĂĆ

CHAPTER 16

RDFãĆţãČİãČijãČĹ

RDF(Resource Descriptor Frame-
work)ãĄŕW3CãĄŇåŃğåŚŁãĄŹãĆŃãĂĄXMLãĆŠãČŹãČijãĆźãĄńãČąãĆ£ãĆşãČşãČĘãČşãČĎãĆŠèĺŸè£řãĄŹãĆŃãĄ§ãĆĄãĄőèę
RDFãĄğå§žæIJňãĄĺãĄłãĆŃãČĞãČijãĆ£æğŃéĂăãĄŕ `triple`
ãĄĺåŚijãĄřãĆŃãĆŃ3ãĄď ãĄőãČĞãČijãĆ£ãĄőçţĎãĄğãĂĄäÿżèłđ(subject)ãĂĄè£řèłđ(predicate)ãĂĄçŻőçŽĎèłđ(object)ãĄőçţĎãĄ
èľşçţ'řãĄŕãĂĄ RDF Concepts And Abstract ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăãĄŢãĄĎãĂĆ

tripleãĄőãČĞãČijãĆ£ãĄŕãĂĄsubjectãĂĄpredicateãĂĄobjectãĆŠãĆşãČ■ãČş
âĂŸïijŽâĂŹãĄğåŇžåĹĞãĄčãĄ§ãČĘãĆ■ãĆźãČĹãĄğèąĺèĺŸãĄŹãĆŃãĄŞãĄĺãĄŇãĄğãĄ■ãĄ¿ãĄŹãĂĆ

äżěäÿŃãĄŕãĂĄéčŻèąŇæľ§ãĄńéŰćãĄŹãĆŃæČĚåăśãĆŠtripleåŇŰãĄŮãĄęåĹŮèĺŸãĄŮãĄ§ä¿ŃãĄğãĂĄâĂİAIRPLANEâĂİãĄĺãA

```
AIRPLANE:hasPurpose:to transport us through the air
AIRPLANE:hasSize:9
AIRPLANE:hasSpeed:12
AIRPLANE:hasSyllables:1
AIRPLANE:isa:Aircraft
AIRPLANE:isa:Transportation
AIRPLANE:lifeArea:Physical
```

æIJňåŕ¿èľ śãĆĺãČşãĆÿãČşãĄőRDFãĆţãČİãČijãČĹãĄŕãĂĄW3CåŃğåŚŁãĄńãĄĆãĆŃåď ŰéČĺãČłãĆ¡ãČijãĆźãĆŠåĹľçŤĺãĄŮãĄ§ãČ

ãĄ¿ãĄ§ãĂĄæď IJçţ'ćæľ §èČ¡ãĄńãĄď ãĄĎãĄęãĆĆãĂĄå■Ÿçţ'ŤãĄłæď IJçţ'ćãĄńåŕ¿å£IJãĄŹãĆŃãĄŞãĄĺãĆŠçŻőçŽĎãĄĺãĄŮãĄęã

16.1 RDFãČĞãČijãĆ£åĞęçŘEçŤĺãĄőAIMLãĆ£ãĆř

æIJňåŕ¿èľ śãĆĺãČşãĆÿãČşãĄğãĄŕãĂĄtemplateèęĄçţ'ăãĄğãĄőRDFãČĞãČijãĆ£åĞęçŘEçŤĺãĄĺãĄŮãĄęäżěäÿŃãĄőAIMLãĆ£ãĆřã

- `addtriple` ïijŽ RDFãČĞãČijãĆ£ãĄőè£¡åŁăãĂĆ
- `deletetriple` ïijŽ RDFãČĞãČijãĆ£ãĄőåL'ŁéŹď ãĂĆ

- `uniq` ïijŽ RDFãČĞãČijãĆ£ãĄńår¿ãĄŹãĆŃæď IJçť´ćïijĹå■Ÿäÿ ĂçţŘæđIJåĞžåŁŻçŤĺïijL'ãĂĆ
- `select` ïijŽ RDFãČĞãČijãĆ£ãĄńår¿ãĄŹãĆŃæď IJçť´ćïijĹèď´ĞåŘĹçţŘæđIJåĞžåŁŻçŤĺïijL'ãĂĆ

ãĄ¿ãĄ§ãĂĄæď´IJçť´ćçţŘæđIJãĆŠåď´L'æŢřãĄńåĞžåŁŻãĄŮãĄ§åät´åŘĹãĄńãĄŕãĂĄäžëäÿŇãĄőAIMLãĆ£ãĆřãĄŇä¡£çŤĺãĄğãĄ■ã
ãĆŠåĽ'çŤĺãĄŮãĄ¿ãĄŹãĂĆ

- `get` ïijŽ æď´IJçť´ćçţŘæđIJãČĞãČijãĆ£ãĆŠåŔŰå¿ŮãĂĆäÿĂéČĺãĄőãČĞãČijãĆ£ãĄőãĄ£ãĆŠåŔŰå¿ŮãĄŹãĆŃåät´åŘĹãĂĄå■
- `first` ïijŽ æď´IJçť´ćçţŘæđIJãČĞãČijãĆ£ãĄŇãĆĽ'ãĂĄåĚĹéă■ãĄőæď´IJçť´ćçţŘæđIJãĆŠåŔŰå¿ŮãĄŮãĄ¿ãĄŹãĂĆ
- `rest` ïijŽ æď´IJçť´ćçţŘæđIJãČĞãČijãĆ£ãĄŇãĆĽ'ãĂĄïijŠçŢłçŻőäžěéŹ■ãĄőæď´IJçť´ćçţŘæđIJãĆŠåŔŰå¿ŮãĄŮãĄ¿ãĄŹãĂĆ
- `set` ïijŽ æď´IJçť´ćçţŘæđIJãČĞãČijãĆ£ãĄőäžŰåď´L'æŢřãĄÿãĄőäžčåĚěãĂĆ

16.2 RDFãČĞãČijãĆ£çőąçŘĘ

åŕ¿èľ´śãĆĺãČşãĆÿãČşãĄğãĄŕãĂĄsubjectãĂĄpredicateãĂĄobjectãĄőçţĐãĄ£åŘĹãĆŔãĄŻãĆŠäÿĂæĐŔãĄőãČĞãČijãĆ£ãĄĺãĄŮãĄ
RDFãČĞãČijãĆ£ãĄőåŘĐãĆĺãČňãČąãČşãČĹãĄŕãĂĄåŕ¿èľ´śãĆĺãČşãĆÿãČşèţůåŃŢæŹĆãĄőåĹİæIJ§ãČ■ãČijãČL'ãĄĺãĄĺãĆĆãĄńãĂ

16.2.1 åĹİæIJ§ãČ■ãČijãČL'

åŕ¿èľ´śãĆĺãČşãĆÿãČşãĄőèţůåŃŢæŹĆãĄńãĂĄäžŃåL'■ãĄńçŤĺæĐŔãĄŮãĄ§ãČŢãĆąãĆd'ãČńç¿d'ãĄŃãĆL'åŘĐãĆĺãČňãČąãČşãČĹã

åŕ¿èśąãČŢãĆąãĆd'ãČńãĄőæŃĞåőŽãĄŕãĂĄ*ãČŢãĆąãĆd'ãČńçőąçŘĘãĄőãĆĺãČşãČĘãĆčãČĘãĆč* ãĄő `rdf`
ãĄğèąŃãĄĐãĂĄèl'šå¡ŞãĄŹãĆŃåĚĺãĄęãĄőåőŽç¿l'ãČŢãĆąãĆd'ãČńãĆŠèł■ãĄ£è¿ijãĆŞãĄğãĂĄãĆĺãČňãČąãČşãČĹãĆŠåśŢéŰŃãA

ïijŁçL'źåőŽãĄőãČŢãĆl'ãČńãČĂéĚ■äÿŃãĄő âĂŸ*.txtâĂŹ ãĄŃãĆL'åśŢéŰŃãĄŹãĆŃåät´åŘĹãĄőä¿ŃïijĹãĆţãČŰãČŢãĆl'ãČńãČĂa

```
client_type:
    storage:
        entities:
            rdf: file

        stores:
            file:
                type: file
                config:
                    rdf_storage:
                        dirs: ../storage/rdfs
                        subdirs: true
                        extension: txt
```

åőŽç¿l'ãČŢãĆąãĆd'ãČńãĄŕãĂĄãĆĺãČňãČąãČşãČĹæŕÕãĄńãĂĄsubjectãĂĄpredicateãĂĄobjectãĆŠãĆşãČ■ãČş
âĂŸïijŽâĂŹãĄğåŇžåĹĞãĄčãĄęåĹÛèĺŸãĄŮãĄ¿ãĄŹãĂĆsubjectãĂĄpredicateãĂĄobjectãĄőãĄĐãĄŽãĆŃãĄŃãĄŅçl'žæŰĞå■Ůã

åŘŃãAŸçţĐãĄ£åŘĹãĆŔãĄŽãĄőãĆĺãČňãČąãČşãČĹãĄŅèď´ĞæŢřæŇĞåőŽãĄŢãĆŃãĄęãĄĐãĆŃåät´åŘĹãĄğãĆĆãĂĄéĞ■èď´ĞçŹ

ãĄłãĄŁãĂĄRDFãČĞãČijãĆ£ãĄńår¿ãĄŹãĆŃæď´IJçť´ćãĆŠåŁźçŐĞçŽĐãĄńèąŃãĄęãĄ§ãĆąãĂĄçŹžéŃšãĄŢãĆŃãĄ§ãČĞãČijãĆ

äžěéŹ■ãĄğãĄŕãĂĄæňąãĄőèÍŸè£řãĆŠãĄŮãĄ§åőŽç¿l'ãČŢãĆąãĆd'ãČńãĆŠåĹİæIJ§ãČ■ãČijãČL'ãĄŮãĄ§ãĆĆãĄőãĄĺãĄŮãĄęèłńæ

```
ant:legs:6
ant:sound:scratch
bat:legs:2
bat:sound:eee
bear:legs:4
```

(continues on next page)

(continued from previous page)

```
bear:sound:grrrrr
buffalo:legs:4
buffalo:sound:moo
cat:legs:4
cat:sound:meow
chicken:legs:2
chicken:sound:cluck cluck
dolphin:legs:0
dolphin:sound:meep meep
fish:legs:0
fish:sound:bubble bubble
```

16.2.2 ãĆÍãČňãČąãČşãČĹè£¡åŁă

templateèęAçt'ăăAő *addtriple* èęAçt'ăăĆŠåĹ'çŤĺãĄŹãĆŃãĄŞãĄĺãĄğãĂĄåŃŢçŽĎãĄńæŰřãĄŮãĄĎãĆÍãČňãČąãČşãČĹãĆŠè£¡åŁ

```
<addtriple>
  <subj>Subject</subj><pred>Predicate</pred><obj>Object</obj>
</addtriple>
```

åŃŢçL'l'ãĄőçL'źæĂğãĆŠè£¡åŁăăĄŹãĆŃä¿ŃãĄğãĄŹãĂĆ

```
<addtriple>
    <subj>cow</subj><pred>sound</pred><obj>moo</obj>
</addtriple>
<addtriple>
    <subj>dog</subj><pred>sound</pred><obj>woof</obj>
</addtriple>
```

åĹİæIJ§ãČ■ãČijãČL'ãĄåŘŇæğŸãĄńæŰĞå■ŮãĆşãČijãČL'åd'L'æŔŻãĆŠèąŇãĄčãĄęçŹżéŇšãĄŹãĆŃãĄ§ãĆĄãĂĄäžëäÿŃãĄőRD

```
COW:SOUND:MOO
DOG:SOUND:WOOF
```

ãĄłãĄŁãĂĄaddtripleãĄğè£¡åŁăăĄŮãĄ§ãĆĞãČijãĆ£ãĄŕæřÿçűŽçŽĎãĄğãĄŕãĄłãĄŔãĂĄåŕ¿èl'śãĆÍãČşãĆÿãČşãĆŠåĘ■èţůåŃŢãĄ

16.2.3 ãĆÍãČňãČąãČşãČĹåL'ŁéŹd'

templateèęAçt'ăăAő *deletetriple* èęAçt'ăăĆŠåĹ'çŤĺãĄŹãĆŃãĄŞãĄĺãĄğãĂĄad-
dtripleèęAçt'ăăAğè£¡åŁăăĄŮãĄ§ãĆÍãČňãČąãČşãČĹãĄăăĄŚãĄğãĄŕãĄłãĄŔãĂĄåĹİæIJ§ãČ■ãČijãČL'ãĄŮãĄ§ãĆÍãČňãČąãČşãČĹ

```
<deletetriple>
  <subj>Subject</subj><pred>Predicate</pred><obj>Object</obj>
</deletetriple>
```

3ãĄd'ãĄőèęAçt'äïijĹsubjectãĂĄpredicateãĂĄobjectïijL'ãĆŠæŇĞåőŽãĄŹãĆŃãĄĺãĂĄåĚĺãĄęåŘĹèĞt'ãĄŮãĄ§ãĆÍãČňãČąãČşãČĹ

subjectãĄĺpredicateãĄăăĄŚãĆŠæŇĞåőŽãĄŮãĄ§åăt'åŘĹãĂĄobjectãĄőåÅd'ãĄńéŰćä£ĆãĄłãĄŔãĂĄåŘĹèĞt'ãĄŹãĆŃãĆÍãČňãČą

subjectãĄăăĄŚãĆŠæŇĞåőŽãĄŮãĄ§åăt'åŘĹãĂĄăĄİãĄősubjectãĄńåŘĹèĞt'ãĄŹãĆŃåĚĺãĄęãĄőãĆÍãČňãČąãČşãČĹãĆŠåL'ŁéŹd'ã

addtripleãĄğè£¡åŁăăĄŮãĄ§ãĆÍãČňãČąãČşãČĹãĄĺãĂĄåĹİæIJ§ãČ■ãČijãČL'ãĄŮãĄ§ãĆÍãČňãČąãČşãČĹãĆŠåL'ŁéŹd'ãĄŹãĆŃä¿Ń

```
<deletetriple>
  <subj>cow</subj><pred>sound</pred><obj>moo</obj>
</deletetriple>
<deletetriple>
  <subj>ant</subj><pred>sound</pred><obj>scratch</obj>
</deletetriple>
```

ãĄłãĄŁãĂĄdeletetripleãĆĆæřÿçűŽçŽĎãĄğãĄŕãĄłãĄŔãĂĄår¿èľśãĆĺãČşãĆÿãČşãĆŠåĘ■èţůåŃŢãĄŮãĄ§æŹĆçĆźãĄğåĹİæIJ§çŁú

16.3 RDFãČĞãČijãĆ£ãĄőæďIJçť́ć

RDFãČĞãČijãĆ£ãĄőæďIJçť́ćèęAçť́ăãĄńãĄŕïijŠçĺőéąđãĄÑãĄĆãĆŁãĄ¿ãĄŹãĄÑãĂĄãĄİãĆŇãĄđãĆŇãĄőäżŢæğŸãĄŕäžěäÿŃãĄ

- `uniqèęAçt'ă`

  ïijŠãĄď ãĄőæď IJçť ćæİąäżűãĆŠæŇĞåőŽãĄŮãĂĄæď IJçť ćçţŘæđIJãĄńår¿ãĄŮãĄęéĞ■èď ĞãĄŮãĄ§æŰĞå■ŮåĹŮãĆŠ

- `selectèęAçt'ă`

  èď ĞæŢřãĄőæď IJçť ćæİąäżűãĄőæŇĞåőŽãĄÑåŔřèČ¡ãĄğãĂĄæď IJçť ćçţŘæđIJãĆŠãĆĺãČñãČąãČşãČĹãĆŠå■Ÿä¡■ãĄĺã

16.3.1 uniqãĄńãĆĹãĆŃæďIJçť́ć

templateèęAçť́ăãĄő *uniq* èęAçť́ăãĆŠçŤĺãĄĎãĄęãĂĄRDFãČĞãČijãĆ£ãĄőæď IJçť ćãĆŠèąÑãĄĎãĄ¿ãĄŹãĂĆ
uniqãĄğãĄőæď IJçť ćãĄğãĄŕãĂĄåŔŰå¿ŮãĄŮãĄ§ãĄĎéäĚçŻõãĄńår¿ãĄŮãĄę âĂŸ?âĂŹ
ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ

çĽźåőŽãĄőæČĚåăśãĆŠåŔŰå¿ŮãĄŹãĆŃåät'åŘĹãĂĄäżěäÿŃãĄőæğŸãĄńèíŸè£ŕãĄŮãĄ¿ãĄŹãĂĆ

```
<uniq>
    <subj>ant</subj>
    <pred>sound</pred>
    <obj>?</obj>
</uniq>
```

çţŘæđIJãĄĺãĄŲãĄęãĂĄsubjectãĂĄpredicateãĄÑäÿĂèĞť ãĄŹãĆŃãĆĺãČñãČąãČşãČĹãĄőobjectãĄőåĂd'ãĄŇåŔŰå¿ŮãĄğãĄ■ãĄ
SCRATCH

æď IJçť ćæŹĆãĄńãĆĺãČñãČąãČşãČĹèęAçť́ăãĄőæŇĞåőŽãĆŠçIJAçŢěãĄŹãĆŃãĄŞãĄĺãĄŇåŔřèČ¡ãĄğãĂĄsubjectãĄőäÿĂèęğãĆŠ

```
<uniq>
    <subj>?</subj>
</uniq>
```

çţŘæđIJãĄĺãĄŮãĄęãĂĄsubjectãĄőäÿĂèęğãĄÑçľžçŹ¡åŇžåĹĞãĆŁãĄğåĞžåŁŻãĄŢãĆŃãĄ¿ãĄŹãĂĆuniqãĄğãĄŕéĞ■èď ĞãĄŹãĆ
ANT BAT BEAR BUFFALO CAT CHICKEN DOLPHIN FISH

çĽźåőŽãĄőæİąäżűãĆŠæŇĞåőŽãĄŹãĆŃä¿ŃãĄĺãĄŮãĄęãĂĄpredicate=âĂİlegsâĂİãĄőæİąäżűãĄğãĂĄobjectãĄőäÿĂèęğãĆŠåŔŰ

```
<uniq>
    <pred>legs</pred>
    <obj>?</obj>
</uniq>
```

çţŘædIJãĄĺãĄŮãĄęãĂĄéĞ■èď˙ĞãĄŮãĄ§ãĆĆãĄőãĄŕéŹď˙åď˙ŰãĄŢãĆŇãĆŃçĆžãĂĄäžëäÿŃãĄőæğŸãĄńãĄŁãĆŁãĄ¿ãĄŹãĂĆ
6 2 4 0

16.3.2 selectãĄńãĆĹãĆŃæďIJçť'ć

templateèęAçť'ãäĄő *select* èęAçť'ãäĆŠçŤĺãĄĎãĄęãĂĄRDFãĆĞãČijãĆ£ãĄőæď'IJçť'ćãĆŠèąŇãĄĎãĄ¿ãĄŹãĂĆ
selectãĄőæď'IJçť'ćçţŘædIJãĄŕãĂĄ[âĂIJèęAçť'ăåŘ■âĂİ, âĂIJåĂď'âĂİ]
ãĆŠæIJĂåřŕå■Ÿä¡■ãĄĺãĄŮãĄęãĂĄãĆĺãČňãČąãČşãČĹæŕŐãĄńæăijçť'■ãĄŢãĆŇãĆŃçĆžãĂĄäžëäÿŃãĄőæğŸãĄłãČłãĆźãČĹå¡ćåi
[[[âĂIJsubjâĂİ, âĂIJANTâĂİ], [âĂIJpredâĂİ, âĂIJLEGSâĂİ], [âĂIJobjâĂİ, âĂIJ6âĂİ]], [[âĂIJsubjâĂİ,
âĂIJANTâĂİ], [âĂIJpredâĂİ, âĂIJSOUNDâĂİ], âĂę], âĂę]

selectãĄğä¡£çŤĺåŕŕèČ¡ãĄłãĆŕãĆĺãČłçŤĺãĄőå■ŘèęAçť'ãäĄńãĄŕ <q>ãĄĺãĄĺãĆĆãĄńãĂĄ<notq>ãĄÑãĄĆãĆŁãĄ¿ãĄŹãĄÑãĂĄ<n

å■Ÿçť'ŤæďIJçť'ć

å■Ÿçť'ŤãĄłæď'IJçť'ćãĄőåăť'åŘĹãĂĄ<q>èęAçť'ãäĄőåĘĚåőźãĄĺãĄŮãĄęãĂĄsubjectãĂĄpredicateãĂĄobjectãĄő3ãĄď'ãĆŠæŇĞåő

```
<select>
    <q><subj>dog</subj><pred>sound</pred><obj>woof</obj></q>
</select>
```

åĹİæIJ§ãČ■ãČijãČL'çŁűæĚŃãĄğãĄŕçţŘædIJãĄŇçl'žæŰĞå■ŮãĄńãĄłãĆŃçĆžãĂĄåŘŰå¿Ůåď'śæŢŮæŹĆãĄőå£IJç■ŤæŰĞãĄŇè£
ãĆŠåő§æŰ¡ãĄŹãĆŃãĄĺãĂĄäžëäÿŃãĄőçţŘædIJãĄŇè£ŤãĄčãĄęãĄ■ãĄ¿ãĄŹãĂĆ
[[[âĂIJsubjâĂİ, âĂIJDOGâĂİ], [âĂIJpredâĂİ, âĂIJSOUNDâĂİ], [âĂIJobjâĂİ, âĂIJWOOFâĂİ]]]

çL'źåőŽãĄőïijŚãĄď'ãĄőèęAçť'ãäĄőãĄ£ãĆŠåŘŰå¿ŮãĄŹãĆŃåăť'åŘĹãĂĄäžëäÿŃãĄőèÍŸè£řãĄÑãĄğãĄ■ãĄ¿ãĄŹãĂĆ

```
<select>
    <q><subj>cat</subj><pred>sound</pred><obj>?</obj></q>
</select>
```

ãĄŞãĄőåăť'åŘĹãĂĄâĂİ?âĂİãĆŠæŇĞåőŽãĄŮãĄ§èęAçť'ãäĄőåĘĚåőźãĆŠçď'žãĄŹãĂĄäžëäÿŃãĄőçţŘædIJãĄŇè£ŤãĄčãĄęãĄ■ã
[[[âĂIJ?âĂİ, âĂIJMEOWâĂİ]]]

åď'L'æŢřãĄńãĆĹãĆŃæďIJçť'ć

èď'ĞæŢřãĄőèęAçť'ãäĆŠè£ŤãĄŹåăť'åŘĹãĆĎãĂĄäÿĂèĞť'ãĄŹãĆŃèęAçť'ãäĄőãČłãĆźãČĹãĆŠåŘŮãĄŚåŘŮãĆŃåăť'åŘĹãĄŕãĂĄåd
åď'L'æŢřãĄŕvarsãĆ£ãĆřãĄőåĘĚåőźãĄğåőŽç¿l'ãĄŮãĂĄåď'L'æŢřåŘ■ãĄőæŐěéã■è¿đãĄĺãĄŮãĄę âĂIJ?âĂİ
ãĆŠäžŸãĄŚãĄ¿ãĄŹãĂĆ

ãĆŕãĆĺãČŀ<q>ãĄğãĆĺãČňãČąãČşãČĹãĄőèęĄçť˘ăãĄńåď˙L˙æŢřãĆŠèĺ■åőŽãĄŹãĆŃãĄŞãĄĺãĄŇãĄğãĄ■ãĄ¿ãĄŹãĂĆ
äžěäÿŃãĄőåät˙åŘĹãĂĄåď˙L˙æŢřïijŽ?x ãĄŕsubjectãĂĄåď˙L˙æŢřïijŽ?y ãĄŕpredicateãĂĄåď˙L˙æŢřïijŽ?z
ãĄŕobjectãĄőæäijçt˙■åŕ¿èśąãĄĺãĄłãĆŁãĄ¿ãĄŹãĂĆ

```
<select>
    <vars>?x ?y ?z</vars>
    <q><subj>?x</subj><pred>?y</pred><obj>?z</obj></q>
</select>
```

æŇĞåőŽãĄŮãĄ§ãČĞãČijãĆ£ãĄńäÿĂèĞt˙ãĄŹãĆŃãĄŹãĄźãĄęãĄőãĆĺãČňãČąãČşãČĹãĄŇãĆL˙ãĂĄåď˙L˙æŢřãĄńèl˙šå¡ŞãĄŹãĆŃ
äžěäÿŃãĄŕãĂĄåŃŢçL˙l˙ãĄőèűşãĄőæIJňæŢř(legs)ãĆŠæd˙IJçt˙ćãĄŹãĆŃä¿ŃãĄğãĄŹãĂĆ

```
<select>
    <vars>?x ?y</vars>
    <q><subj>?x</subj><pred>legs</pred><obj>?y</obj></q>
</select>
```

æd˙IJçt˙ćçţŘædIJãĄŇåŘĹèĞt˙ãĄŮãĄ§åät˙åŘĹãĂĄäžěäÿŃãĄőægŸãĄńåď˙L˙æŢřãĄńèl˙šå¡ŞãĄŹãĆŃæČĚåäśãĄőãĄ£ãĄőçţŘædIJã
[[[âĂIJ?xâĂİ, âĂIJANTâĂİ], [âĂIJ?yâĂİ, âĂIJ6âĂİ]], [[âĂIJ?xâĂİ, âĂIJBATâĂİ], [âĂIJ?yâĂİ, âĂIJ2âĂİ]],
[[âĂIJ?xâĂİ, âĂIJBEARâĂİ], [âĂIJ?yâĂİ, âĂIJ4âĂİ]], [[âĂIJ?xâĂİ, âĂIJBUFFALOâĂİ], [âĂIJ?yâĂİ,
âĂIJ4âĂİ]], [[âĂIJ?xâĂİ, âĂIJCATâĂİ], [âĂIJ?yâĂİ, âĂIJ4âĂİ]], [[âĂIJ?xâĂİ, âĂIJCHICKENâĂİ],
[âĂIJ?yâĂİ, âĂIJ2âĂİ]], [[âĂIJ?xâĂİ, âĂIJDOLPHINâĂİ], [âĂIJ?yâĂİ, âĂIJ0âĂİ]], [[âĂIJ?xâĂİ,
âĂIJFISHâĂİ], [âĂIJ?yâĂİ, âĂIJ0âĂİ]]]

èď˙ĞåŘĹæİąäžűæď˙IJçť˙ć

åď˙L˙æŢřãĆŠä¡£çŤĺãĄŮãĄ§åät˙åŘĹãĄńãĄŕãĂĄèd˙ĞæŢřãĄőãĆŕãĆĺãČłãĆŠä¡£çŤĺãĄŹãĆŃãĄŞãĄĺãĄğæİąäžűãĆŠçţđãĆŁè¿ijãĆĂ

äžěäÿŃãĄőä¿ŃãĄğãĄŕãĂĄïijŚãĄď˙çŻőãĄőãĆŕãĆĺãČłãĄğåŘŰå¿ŮãĄŮãĄ§subjectãĄőãČłãĆźãČĹãĄĺãĂĄïijŠãĄd˙çŻőãĄőãĆŕãĆĺ

```
<select>
    <vars>?x</vars>
    <q><subj>?x</subj><pred>legs</pred><obj>0</obj></q>
    <q><subj>?x</subj><pred>sound</pred></q>
</select>
```

çţŘædIJãĄĺãĄŮãĄęãĂĄpredicate=âĂİlegsâĂİãĄğobject=âĂİ0âĂİãĄŇåőŽç¿l˙ãĄŢãĆŃãĄ§subjectãĄőäÿ■ãĄğãĂĄpredicate=âĂİs
[[[âĂIJ?xâĂİ, âĂIJDOLPHINâĂİ]], [[âĂIJ?xâĂİ, âĂIJFISHâĂİ]]]

ãĄŢãĆL˙ãĄńåď˙L˙æŢřãĆŠä¡£çŤĺãĄŹãĆŃãĄŞãĄĺãĄğãĂĄèl˙šå¡ŞãĄŹãĆŃsubjectãĄőäÿ■ãĄŇãĆL˙çL˙źåőŽãĄőèęĄçť˘ăãĄőæČĚåäśã

```
<select>
    <vars>?x ?y</vars>
    <q><subj>?x</subj><pred>legs</pred><obj>0</obj></q>
    <q><subj>?x</subj><pred>sound</pred><obj>?y</obj></q>
</select>
```

çţŘæđIJãĄŕæňąãĄőæğŸãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ
[[[âĂIJ?xâĂİ, âĂIJDOLPHINâĂİ], [âĂIJ?yâĂİ, âĂIJMEEP MEEPâĂİ]], [[âĂIJ?xâĂİ, âĂIJFISHâĂİ], [âĂIJ?yâĂİ, âĂIJBUBBLE BUBBLEâĂİ]]]

ãČĞãČijãĆ£åŔŰå¿Ů

selectèęAçt'ăãĄŕãĂĄSQLãĄőSELECTæŰĞãĄõãĆĹãĄĘãĄńãČĞãČijãĆ£ãĆżãČČãČĹãĆŠä¡IJæĹŘãĄŹãĆŃãĄ§ãĆĄãĄńä¡£çŤĺãA

äžëäÿŃãĄőä¿ŃãĄğãĄŕãĂĄselectèęAçt'ăãĄőåŔŰå¿ŮçţŘæđIJãĆŠâĂŹsetâĂŹãĆ£ãĆřãĆŠçŤĺãĄĐãĄęãĂĄtuplesãĄńæăijçt'■ãĄŮãA

```
<set var="tuples">
    <select>
        <vars>?x ?y</vars>
        <q><subj>?x</subj><pred>sound</pred><obj>?y</obj></q>
    </select>
</set>
```

ãĄŞãĄőåăt'åŘĹãĄńãĂĄtuplesãĄńäžëäÿŃãĄőåĘĚåőźãĄŃèĺ■åőŽãĄŢãĆŃãĄęãĄĐãĄ¿ãĄŹãĂĆ
[[[âĂIJ?xâĂİ, âĂIJBATâĂİ], [âĂIJ?yâĂİ, âĂIJEEEâĂİ]], [[âĂIJ?xâĂİ, âĂIJBEARâĂİ], [âĂIJ?yâĂİ, âĂIJGRRRRRâĂİ]], [[âĂIJ?xâĂİ, âĂIJBUFFALOâĂİ], [âĂIJ?yâĂİ, âĂIJMOOâĂİ]], [[âĂIJ?xâĂİ, âĂIJCATâĂİ], [âĂIJ?yâĂİ, âĂIJMEOWâĂİ]], [[âĂIJ?xâĂİ, âĂIJCHICKENâĂİ], [âĂIJ?yâĂİ, âĂIJCLUCK CLUCKâĂİ]], [[âĂIJ?xâĂİ, âĂIJDOLPHINâĂİ], [âĂIJ?yâĂİ, âĂIJMEEP MEEPâĂİ]], [[âĂIJ?xâĂİ, âĂIJFISHâĂİ], [âĂIJ?yâĂİ, âĂIJBUBBLE BUBBLEâĂİ]], [[âĂIJ?xâĂİ, âĂIJDOGâĂİ], [âĂIJ?yâĂİ, âĂIJWOOFâĂİ]]]

åL'■è£řãĄőâĂŹselectâĂŹèęAçt'ăãĄÑãĆL'çŤ§æĹŘãĄŢãĆÑãĄ§ãČĞãČijãĆ£ãĆŠåŔŰå¿ŮãĄŹãĆÑåăt'åŘĹãĂĄâĂŹgetâĂŹãĆ£ãĆř

```
<get var="?x">
    <tuple>
        <get var="tuples" />
    </tuple>
</get>
<get var="?y">
    <tuple>
        <get var="tuples" />
    </tuple>
</get>
```

ãĄŞãĄőä¿ŃãĄőåăt'åŘĹãĂĄgetãĄőâĂŹvarâĂŹåśđæĂğãĄńãĂĄselectèęAçt'ăãĄğæŇĞåőŽãĄŮãĄ§åd'L'æŢř
âĂIJ?xâĂİ ãĆŠæŇĞåőŽãĄŮãĄęãĄĐãĄ¿ãĄŹãĂĆ

æňąãĄńãĂĄtupleãĆ£ãĆřãĄğãĂĄselectèęAçt'ăãĄőçţŘæđIJãĆŠæăijçt'■ãĄŮãĄ§âĂİtuplesâĂİ(ãČłãĆźãČĹãĆłãČŰãĆÿãĆğãĆřãČĹ)
âĂIJ?xâĂİ ãĄńèl'šå¡ŞãĄŹãĆŃãČĞãČijãĆ£ãĄŇåŔŰå¿ŮãĄğãĄ■ãĄ¿ãĄŹãĂĆ
çţŘæđIJãĄĺãĄŮãĄęãĂĄåd'L'æŢř âĂIJ?xâĂİ ãĄŃãĆL'ãĄŕäžëäÿŃãĄőåĘĚåőźãĄŇåŔŰå¿ŮãĄğãĄ■ãĄ¿ãĄŹãĂĆ

BAT BEAR BUFFALO CAT CHICKEN DOLPHIN FISH DOG
åŘŇæğŸãĄńãĂĄåd'L'æŢř âĂIJ?yâĂİ ãĄŃãĆL'ãĄŕäžëäÿŃãĄőåĘĚåőźãĄŇåŔŰå¿ŮãĄğãĄ■ãĄ¿ãĄŹãĂĆ
EEE GRRRRR MOO MEOW CLUCK CLUCK MEEP MEEP BUBBLE BUBBLE WOOF

ãĄ¿ãĄ§ãĂĄâĂİtuplesâĂİãĄńår¿ãĄŮãĄęãĂĄfirstãĆ£ãĆřãĂĄrestãĆ£ãĆřãĆŠåĹl'çŤĺãĄŹãĆŃãĄŞãĄĺãĄğãĂĄäžëäÿŃãĄőæğŸãĄ

```
<get var="?x">
    <tuple>
        <first><get var="tuples" /></first>
    </tuple>
</get>
<get var="?y">
    <tuple>
        <rest><get var="tuples" /></rest>
    </tuple>
</get>
```

çţŘædIJãĄĺãĄŮãĄęãĂĄfirstãĆ£ãĆř(åĚĹéă■ãČĞãČijãĆ£åŔŰå¿Ů)ãĄğãĂĄåd'L'æŢř âĂIJ?xâĂİ
ãĄŃãĆL'åŔŰå¿ŮãĄŮãĄ§åĂd'ãĄŕäžëäÿŃãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ
BAT

åŘŇæğŸãĄńãĂĄrestãĆ£ãĆř(åĚĹéă■äžëåd'ŰãĄőãČĞãČijãĆ£åŔŰå¿Ů)ãĄğãĂĄåd'L'æŢř âĂIJ?yâĂİ
ãĄŃãĆL'åŔŰå¿ŮãĄŮãĄ§åĂd'ãĄŕäžëäÿŃãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ
GRRRRR MOO MEOW CLUCK CLUCK MEEP MEEP BUBBLE BUBBLE WOOF

CHAPTER 17

Security

è‡■èÍijãĄÍæL'£è‡■ãĄő2æőţéŽÕãĄőãĆżãĆ■ãČěãČłãČĘãĆčåőŽç¿l'ãĄÑãĄĆãĆŁãĄ¿ãĄŹãĂĆ

17.1 è‡■èÍij(Authentication)

è‡■èÍijæl'§èČ¡ãĄŕèęĄäżűãĄńå£IJãĄŸãĄ§ãČęãČijãĆűçőąçŘĘç■L'ãĄőåĂŃåĹěãĄőåő§èčĚãĄÑå£ĚèęĄãĄńãĄłãĆŃæl'§èČ¡ãĄőãĄ§
ãĄ¿ãĄ§ãĂĄåd'ŰéČÍãĆţãČijãČŞãĆźãĆŠåĹl'çŤÍãĄŮãĄęè‡■èÍijãĆŠèąÑãĄĘãĂĄaccount_linker
ãĄńãĄd'ãĄĎãĄęãĄŕãĂĄår¿èl'śåĞęçŘĘãĄÍãĄŕåĹěãĄńåő§æŰ¡ãĄŹãĄźãĄ■æl'§èČ¡ãĄőãĄ§ãĆĄä¡£çŤÍãĄğãĄ■ãĄ¿ãĄŻãĆŞãĂĆ

åĹěéĂŤãĂĄå£ĚèęĄãĄł è‡■èÍijæL'ŃçűŽãĄ■ãĆŠäÿŁä¡■ãĄőãĆćãČŮãČłãĆśãČijãĆůãČğãČşç■L'ãĄğèąÑãĄčãĄ§äÿŁãĂĄår¿èl'śåĞęç

äžěäÿŇãĄńãĂĄè‡■èÍijãĄńéŰćãĄŹãĆŃå§žæIJňçŽĎãĄłåĹűå¿ąæğŃéĂäãĄńãĄd'ãĄĎãĄęè‡ňæŸÕãĄŮãĄ¿ãĄŹãĂĆ

è‡■èÍijãĄŕãĆşãĆćãĆşãČijãČL'ãĄőbrainåĘĚãĄğåő§æŰ¡ãĄŢãĆŇãĂĄãČęãČijãĆűãĄŇãĆL'ãĄőçŹžèl'śæŰĞæŕÕãĄńåĞęçŘĘãĄŢãĆ
ask_question() åĘĚãĄğåŚijãĄşåĞžãĄŢãĆŇãĄ¿ãĄŹãĂĆ

ãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşãĄğæŇĞåőŽãĄŢãĆŇãĄ§è‡■èÍijãĆţãČijãČŞãĆźãĆŠåĹl'çŤÍãĄŮãĄęĂĄè‡■èÍijãĄŢãĆŇãĄ§

```
class Brain(object):

    def __init__(self, bot, configuration: BrainConfiguration):
        self._security = SecurityManager(configuration.security)

    def authenticate_user(self, client_context):
        return self._security.authenticate_user(client_context)

    def ask_question(self, bot, clientid, sentence):

        authenticated = self._security.authenticate_user(client_context)
        if authenticated is not None:
            return authenticated
```

èł■èÍijãĆţãČijãČŞãĆźãĄŕãĂĄãĆşãČşãČŢãĆčãĆŕãČňãČijãĆůãČğãČşãĄőåőŽç¿l'ãĄńå¿ŞãĄčãĄęãĂĄSecurityManagerãĄńãĆĹãĄč
SecurityManagerãĄő authenticate_user() ãĆŠåő§æŰ¡ãĄŹãĆÑãĄŞãĄÍãĄğãĂĄèł■èÍijãĆţãČijãČŞãĆźåĘĚãĄő
authenticate() ãĄŇåŚijãĄşåĞžãĄŢãĆÑãĄ¿ãĄŹãĂĆ

```
class Authenticator(object):

    def __init__(self, configuration: BrainSecurityConfiguration):
        self._configuration = configuration

    @property
    def configuration(self):
        return self._configuration

    def get_default_denied_srai(self):
        return self.configuration.denied_srai

    def authenticate(self, clientid: str):
        return False
```

äžëäÿÑãĄőèł■èÍijãĆţãČijãČŞãĆźãĄőä¿ÑãĄğãĄŕãĂĄåŕ¿èl'śåĞęçŘĘãĄõãĆćãČŮãČłãĆśãČijãĆůãČğãČşãĄőè■ŸåĹěåŘ■ãĄÍãĄłãĆ
ãĄŞãĄőåő§èčĚãĄğãĄŕãĂĄclientidïijŽâĂŹconsoleâĂŹãĄğãĆćãĆŕãĆźãĆźãĄŢãĆÑãĄ§ãČęãČijãĆűãĄőâĂŹuseridâĂŹãĆŠâĂŹaut

```
class ClientIdAuthenticationService(Authenticator):

    def __init__(self, configuration: BrainSecurityConfiguration):
        Authenticator.__init__(self, configuration)
        self.authorised = [
            "console"
        ]

    def user_auth_service(self, client_context):
        return False

    def _auth_clientid(self, client_context):
        authorised = self.user_auth_service(client_context)
        if authorised is True:
            self.authorised.append(client_context.userid)
        return authorised

    def authenticate(self, client_context):
        try:
            if client_context.userid in self.authorised:
                return True
            else:
                if self._auth_clientid(client_context) is True:
                    return True

                return False
        except Exception as excep:
            YLogger.error(client_context, str(excep))
            return False
```

äÿŁèÍŸæl'§èČ¡ãĆŠä¡£çŤÍãĄŹãĆÑãĄńãĄŕãĂĄBrainãĆşãČşãČŢãĆčãĆŕãČňãČijãĆůãČğãČşãĄő *security*
ãĄğãĂĄäžëäÿÑãĄőéăĚçŻõãĆŠåőŽç¿l'ãĄŹãĆÑå£ĚèęĄãĄŇãĄĆãĆŁãĄ¿ãĄŹãĂĆ

```
brain:
    security:
        authentication:
            classname: programy.security.authenticate.clientidauth.
↪ClientIdAuthenticationService
```

17.2 æL'£èł■(Authorisation)

æL'£èł■ãAŕãĂĄtemplateãĄő *authorise*
èęAçt'ăãAńãĄŁãĄĎãAęãĂĄéĚ■äÿŃãAńãĄĆãĆŃåŘĎèęAçt'ăãAőåśŢéŰŃãĆŠåĹűå¿ąãĄŹãĆŃçĆžãAńèąŇãĄĎãA¿ãĄŹãĂĆ

æL'£èł■ãĆĆèł■èĺijãAĺåŘŇãAŸãĄŔèęAäżűãAńå£IJãAŸãA§åĞęçŘĘãAŇå£ĚèęAąAğãĄĆãĆŁãĂÅåd'L'æŻt'ãĆŠåŔŕèČ¡ãAńãĄŹãĆ

`authorise` èęAçt'ăãAğãAőæL'£èł■åĞęçŘĘãAŕãĂĄäžëäÿŃãAőæğŸãAńèąŇãAčãAęãĄĎãA¿ãĄŹãĂĆ

```
class TemplateAuthoriseNode(TemplateNode):

    def resolve_to_string(self, client_context):

        if client_context.brain.security.authorisation is not None:
            try:
                allowed = client_context.brain.security.authorisation.
↪authorise(client_context.userid, self.role)
            except AuthorisationException:
                allowed = False
```

æL'£èł■ãĆţãČijãČŞãĆźãAŕãĂĄãĆşãČşãČŢãĆčãĆřãČňãCijãĆůãČğãČşãAőåőŽç¿l'ãAńå¿ŞãĄčãAęãĂĄbrain.security.authorisation
ãAńãČ■ãCijãČL'ãAŢãĆŇãĆŃãĆŕãČl'ãĆźãAğãĂĄãAİãAőå§žåžŢãĆŕãČl'ãĆźãAŕæňąãAőãĆĹãAĘãAńåőŽç¿l'ãAŢãĆŇãAęãĄĎãA¿

```
class Authoriser(object):

    def __init__(self, configuration: BrainSecurityConfiguration):
        self._configuration = configuration

    @property
    def configuration(self):
        return self._configuration

    def get_default_denied_srai(self):
        return self.configuration.denied_srai

    def authorise(self, userid, role):
        return False
```

äžëäÿŃãAńãĂĄauthoriseèęAçt'ăãAğä¡£çŤĺãĄŮãAęãĄĎãĆŃãĂĄãČęãCijãĆűãAőè■ŸåĹěåŘ■âĂźuseridâĂźãĆŠåĚČãAńèąŇãAĘa

ãĆůãČŁãČłãĆłãAğãAőæL'£èł■ãĆŠçŤĺãĄĎãA§èÍŸèijL'ãAŕãĂĄåĹl'çŤĺåĹűéŹŘãĆŠãĄŇãĄŠãĆŃtemplateèęAçt'ăãĆŠãĂĂauthor
ãĆ£ãĆŕãAğåŻšãĆĂãĄŞãAĺãAğæŇĞåőŽãĄŮãA¿ãĄŹãĂĆ
äžëäÿŃãAőãĆůãČŁãČłãĆłãAőåät'åŘĹãĂĂçŹžèl'śæŰĞãAğâĂŹALLOW
ACCESSâĂŹãĄŇåĚěåŁŻãĄŢãĆŇãA§åät'åŘĹãĂĂąæŇĞåőŽãĄŢãĆŇãA§âĂźuseridâĂŹãĄŇ âĂŸrootâĂŹ
ãAőæĺl'éŹŘ(role)ãĆŠæŇĄãAčãAęãĄĎãĆŃåät'åŘĹãĂĂâĂŹAccess AllowedâĂŹ
ãAőæŰĞå■ŮãĄŇåd'L'ãĄĹåĚěãĆŁãA¿ãĄŹãĄŇãĂĄæŇĄãAčãAęãĄĎãĄłãĄĎåät'åŘĹãAńãAŕçl'žæŰĞå■ŮãĄŇè£ŤãĆŁãA¿ãĄŹã

```
<category>
    <pattern>ALLOW ACCESS</pattern>
    <template>
        <authorise role="root">
            Access Allowed
        </authorise>
    </template>
</category>
```

æL'£èł■åĞęçŘĘãĆŠèąŇãĄĘãĆŕãČľãĆźãĄőåő§èčĚãĄŕäžěäÿŇãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

```
class BasicUserGroupAuthorisationService(Authoriser):

    def __init__(self, config: BrainSecurityAuthorisationConfiguration):
        Authoriser.__init__(self, config)
        self._users = {}
        self._groups = {}

    @property
    def users(self):
        return self._users

    @property
    def groups(self):
        return self._groups

    def initialise(self, client):
        self.load_users_and_groups(client)

    def load_users_and_groups(self, client):
        if client.storage_factory.entity_storage_engine_available(StorageFactory.
↪USERGROUPS) is True:
            storage_engine = client.storage_factory.entity_storage_
↪engine(StorageFactory.USERGROUPS)
            usergroups_store = storage_engine.usergroups_store()
            usergroups_store.load_usergroups(self)
        else:
            YLogger.warning(self, "No user groups defined, authorisation tag will␣
↪not work!")

    def authorise(self, userid, role):
        if userid not in self._users:
            raise AuthorisationException("User [%s] unknown to system!" % userid)

        if userid in self._users:
            user = self._users[userid]
            return user.has_role(role)
        return False
```

åřŽãĂĄæIJňæľ§èČ¡ãĆŠä¡£çŤĺãĄŹãĆŃçĆžãĂĄBrainãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşãĄő *security*
ãĄğãĂĄäžěäÿŇãĄőéăĚçŻőãĆŠåőŽç¿l'ãĄŹãĆŃå£ĚèęĄãĄŇãĄĆãĆŁãĄ¿ãĄŹãĂĆ

```
security:
    authorisation:
        classname: programy.security.authorise.usergroupsauthorisor.
↪BasicUserGroupAuthorisationService
        denied_srai: AUTHORISATION_FAILED
        denied_text: Access Denied!
```

ãĂĂâĂż `denied_srai` ãĂĄ `denied_text` ãĄŕãĂĄè■èÍijåď´śæŢŮæŹĆãĄőåŃŢä¡IJãĄńéŰćãĄŹãĆŃãĆłãČŮãĆůãČğãČşãĄğã

17.2.1 ãČęãČijãĆűãĆřãČńãČijãČŮãČŢãĆąãĆď'ãČń

æL'£èł■åĞęçŘĘãĆŠåĹűå¿ąãĄŹãĆŃãĄ§ãĆĄãĄńãĂĄãČęãČijãĆűïijĹuserIdïijL'ãĄĺæÍl'éŹŘïijĹroleïijL'ãĄőéŰćä£ĆãĆŠåőŽç¿l'ãĄŹ
usergroupsãĆĺãČşãČĘãĆčãČĘãĆč ãĄğæŇĞåőŽãĄŮãĄ§ãČŢãĆąãĆď'ãČńãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

åőŽç¿l'ãĄŕãĂĄyaml¡ćåijŔãĄğèąŇãĄĎãĄ¿ãĄŹãĂĆå§žæIJňçŽĎãĄłèÍŸè£ŕå¡ćåijŔãĄŕãĂĄäžěäÿŇãĄőïijŠãĄď'ãĄőå¡ćåijŔãĄńãĄ

ïijŚãĄď˙çŻőãĄŕãĂĄãČęãČijãĆűæŕŐãĄńæĺľéŹŘãĆŠèĺŸèijĽãĄŹãĆŃæŰźåijŔãĄgãĄŹãĂĆ

```
users:
  ãČęãČijãĆűåŘ■:
    roles: æĺl'éŹŘåŘ■ãČłãĆźãČĹ
```

ïijŠãĄď˙çŻőãĄŕãĂĄãĆřãČńãČijãČŮåŘ■ãĆŠèęŔåőŽãĄŮãĂĄãĆřãČńãČijãČŮæŕŐãĄńæĺľéŹŘãĆŠæŇĞåőŽãĄŮãĂĄèľšå¡ŞãĄŹãĆ

```
groups:
  ãĆřãČńãČijãČŮåŘ■:
    roles: æĺl'éŹŘåŘ■ãČłãĆźãČĹ
    users: ãČęãČijãĆűåŘ■ãČłãĆźãČĹ
```

äżěäÿŃãĄőä¿ŃãĄgãĄŕãĂĄâĂŹadministratorâĂŹãĄőæĺľéŹŘãĄŕâĂŹrootãĄĺâĂŹuserâĂŹãĂĄâĂŹothersâĂŹãĄőæĺľéŹŘãĄŕâĂŹ

èĺ■åőŽä¿Ń

```
users:
  administrator:
    roles: root, user
  others:
    roles: user

groups:
   general:
      users: guest1, guest2
      roles: guest
```

ãA¿ãĄ§ãĂĄgroupsãĆŠå■ŘãĆ£ãĆřãĄgæŇĞåőŽãĄŹãĆŃãĄŞãĄĺãĄgéŰćä£ĆäżŸãĄŚãĄŇãĄgãĄ■ãĆŃãĄ§ãĆĄãĂĄäżěäÿŃãĄőæ§

ãĄŞãĄőåät˙åŘĹãĄńãĄŕãĂĄçtŘæđIJçŽĎãĄńãĂĄâĂŹconsoleâĂŹãĄőæĺľéŹŘãĄŕâĂŹuserâĂŹãĄńåŁãĄĹãĄęãĂĄâĂŹrootâĂŹã

èĺ■åőŽä¿Ń

```
users:
  console:
    roles: user
    groups: sysadmin

groups:
  sysadmin:
    roles: root, admin, system
    groups: user
  user:
    roles: ask
```

åřŽãĂĄãĆřãČńãČijãČŮãĆŠéŰćä£ĆäżŸãĄŚãĄęèĺŸè£řãĄŮãĄ§åät˙åŘĹãĂĄæIJĂçtÇçŽĎãĄńãČęãČijãĆűãĄńår¿ãĄŹãĆŃæĺľéŹŘã
åŘĹãĂĄèĺŸè£řçt˙ŤæČĚãĄńéŰćä£ĆãĄłãĄŔ‘‘users‘‘ åőŽç¿l˙ãĄőåśŢéŰŃãĆŠåĚĹãĄńèąŇãĄĘçĆžãĂĄusers
åőŽç¿l˙ãĄgãČęãČijãĆűãĄőæĺľéŹŘãĆŠæŇĞåőŽãĄŮãĄęãĄĎãĆŃåät˙åŘĹãĂĄgroups
åőŽç¿l˙ãĄgåŘŇãĄŸãČęãČijãĆűãĄńåĹěãĄőæĺľéŹŘãĆŠæŇĞåőŽãĄŮãĄęãĆĆãĂĄusers
ãĄgãĄőæŇĞåőŽãĄŇåĎłåĚĹãĄŢãĆŃãA¿ãĄŹãĂĆ

CHAPTER 18

Pre/Post Processors

åŕ¿èľ´śãĆĺãČşãĆÿãČşåĘĚãĄńãĄŕPre ProcessorsãĄÍPost
ProcessorsãĄő2çĺőéąđãĄőãČŮãČ■ãĆżãČČãĆţãĄÑãĄĆãĆŁãĄ¿ãĄŹãĂĆ

çŹžèľ´śæŰĞãĄńåŕ¿ãĄŮãĂĄåŕ¿èľ´śãĆĺãČşãĆÿãČşåĘĚãĄğãĄőåŕ¿èľ´śåĞęçŘĘåL'■ãĄńåŁăåůěãĄŹãĆŃå£ĚèęĄãĄÑãĄĆãĆŃåăť'åŘĹ

- *Pre Processors* ãĄŕãĂĄåŕ¿èľ´śãĆĺãČşãĆÿãČşåĘĚéČĺãĄğåŕ¿èľ´śåĞęçŘĘãĆŠèąÑãĄĘåL'■ãĄńãĂĄæŰĞå■ŮåĹŮãĄőåL'■åĞęç
- *Post Processors* ãĄŕãĂĄåŕ¿èľ´śãĆĺãČşãĆÿãČşåĘĚéČĺãĄğåŕ¿èľ´śåĞęçŘĘãĆŠèąÑãĄčãĄ§å£IJç■ŤæŰĞãĄńåŕ¿ãĄŮãĂĄAPIãA

18.1 Pre Processors

Pre ProcessorsãĄŕãĂĄäžëäÿÑãĄőæŁ¡èśąå§žæIJñãĆŕãČľãĆźãĄÑãĆL'çűŹæL'£ãĄŮãĄ¿ãĄŹãĂĆ

```
programy.processors.processing.PreProcessor
```

ãĄŞãĄőãĆŕãČľãĆźãĄńãĄŕå■Ÿäÿ̈ĂãĄőãČąãĆ¡ãČČãČL'processãĄÑãĄĆãĆŁãĂĄåĚěåŁŻãĄŢãĆÑãĄ§stringãĄńåŕ¿ãĄŮåL'■åĞęçŘ
è£Ťå■t'ãĄŢãĆÑãĄ§æŰĞå■ŮåĹŮãĆŠåŕ¿èľ´śãĆĺãČşãĆÿãČşåĘĚãĄğåĹľçŤĺãĄŮåŕ¿èľ´śãĆŠéĂšèąÑãĄŮãĄ¿ãĄŹãĂĆ

```
class PreProcessor(Processor):

    def __init__(self):
        Processor.__init__(self)

    @abstractmethod
    def process(self, bot, clientid, string):
        pass
```

18.2 Post Processors

Post ProcessorsãĄŕãĂĄäžëäÿÑãĄőæŁ¡èśąå§žæIJñãĆŕãČľãĆźãĄÑãĆL'çűŹæL'£ãĄŮãĄ¿ãĄŹãĂĆ

```
programy.processors.processing.PostProcessor
```

ãĄŞãĄőãĆŕãČl'ãĆźãĄńãĄŕå■Ÿäÿ ĂãĄőãČąãĆ¡ãČČãČL'processãĄÑãĄĆãĆŁãĂĄåĚěåŁŻãĄŢãĆŇãĄ§stringãĄńår¿ãĄŮåL'■åĞęçĚ
è£Ťå■t'ãĄŢãĆŇãĄ§æŰĞå■ŮåĹŮãĆŠãĆĺãČşãČL'ãČęãČijãĆűãĄńår¿ãĄŹãĆŃå£IJç■ŤæŰĞãĄĺãĄŮãĄęä¡£çŤĺãĄŮãĄ¿ãĄŹãĂĆ

```
class PostProcessor(Processor):
    def __init__(self):
        Processor.__init__(self)

    @abstractmethod
    def process(self, bot, clientid, string):
        pass
```

CHAPTER 19

ãĆńãĆźãĆ£ãČăèęĄçťă

åŕ¿èľśãĆĺãČşãĆÿãČşãĄŕAIMLãĄőpatternèęĄçť˙ăãČżtemplateèęĄçť˙ăãĄńåŕ¿ãĄŮãĄęãĂĄä¡£çŤĺåŘŕèČ¡ãĄłèęĄçť˙ăãĄőæŇĞåőŽãĆ

æŰřãĄŮãĄĎèęĄçť˙ăãĆŠè£¡åŁăãĄŹãĆŃåăť˙åŘĹãĄńãĄŕãĂĄåĹľçŤĺèĂĚãĄőãČŃãČijãĆžãĆĎãĆůãĆźãČĘãČăèęĄäżűãĄńæš£ãĄčã

æŮćå■ŸèęĄçť˙ăãĄńãĄď˙ãĄĎãĄęãĆĆãĂĄåĞęçŘĘåĘĚåőźãĆŠåď˙L˙æŻť˙ãĄŮãĄ§èęĄçť˙ăåő§èčĚãĆŠèď˙ĞæŢřçŤĺæĎŔãĄŹãĆŃãĄŞ

- *pattern_nodes.conf* ïijŽ patternãĄğåĹľçŤĺãĄğãĄ■ãĆŃèęĄçť˙ăãĄőåőŽç¿l˙ãČŢãĆąãĆď˙ãČńãĂĆ
- *template_nodes.conf* ïijŽ templateãĄğåĹľçŤĺãĄğãĄ■ãĆŃèęĄçť˙ăãĄőåőŽç¿l˙ãČŢãĆąãĆď˙ãČńãĂĆ

CHAPTER 20

ãĆńãĆźãĆ£ãČăpatternèęĄçťă

åŕ¿èľśãĆĺãČşãĆÿãČşãĄŕ patternèęĄçťăăĄĺãĄŮãĄęãĂĄpattern_nodes.conf
ãĄğåőŽç¿ľãĄŢãĆŇãĄęãĄĎãĆŃAIMLãĆ£ãĆřãĆŠãĆţãČĺãČijãČĹãĄŮãĄ¿ãĄŹãĂĆ
pattern_nodes.conf
ãĆŠåd'L'æŻt'ãĄŹãĆŃãĄŞãĄĺãĄğãĂĄèęĄçť'ăăĄńåŕ¿å£IJãĄŹãĆŃåĞęçŘĘãĆřãČľãĆźãĆŠåd'L'æŻt'ãĄŮãĄ§ãĆŁãĂĄçŃňèĞłãĄőè

èęĄçt'ăăĄőåő§èčĚãĆŠåd'L'æŻt'ãĄŹãĆŃãĄĺãĂĄãČŚãČijãĆţãĄŇåŃŢä¡IJãĄŮãĄłãĄŔãĄŁãĂĄçãĄ§ãĆŁãČŚãČŢã

èęĄçť'ăæŕŐãĄńäżěäÿŃãĄőèĺŸè£řãĆŠåĹŮèĺŸãĄŮãĄ¿ãĄŹãĂĆ

```
AIMLãĆ£ãĆřåŘ■ = pythonåĞęçŘĘãĆřãČl'ãĆźãĄőãČŚãĆź
```

ïijŁèĺŸè£řä¿Ń

```
#AIML 1.0
root = programy.parser.pattern.nodes.root.PatternRootNode
word = programy.parser.pattern.nodes.word.PatternWordNode
priority = programy.parser.pattern.nodes.priority.PatternPriorityWordNode
oneormore = programy.parser.pattern.nodes.oneormore.PatternOneOrMoreWildCardNode
topic = programy.parser.pattern.nodes.topic.PatternTopicNode
that = programy.parser.pattern.nodes.that.PatternThatNode
template = programy.parser.pattern.nodes.template.PatternTemplateNode

#AIML 2.0
zeroormore = programy.parser.pattern.nodes.zeroormore.PatternZeroOrMoreWildCardNode
set = programy.parser.pattern.nodes.set.PatternSetNode
bot = programy.parser.pattern.nodes.bot.PatternBotNode

#Custom
iset = programy.parser.pattern.nodes.iset.PatternISetNode
regex = programy.parser.pattern.nodes.regex.PatternRegexNode
```

æŰřãĄ§ãĄłtemplateèęĄçť'ăăĆŠä¡IJæĹŘãĄŹãĆŃåăť'åŘĹãĂĄprogramy.parser.pattern.nodes.base.PatternNode
ãĆŠå§žåžŢãĆřãČľãĆźãĄĺãĄŮãĄęçűŹæL'£ãĄŮãĄ¿ãĄŹãĂĆ

æIJňå§žåžŢãĆŕãČľãĆźãĆŠçűŹæL’£ãĄŹãĆŃãĄŞãĄÍãĄğãĂĄAIMLãĄőXMLèęAçť’ăãĆŠpatternãĆŕãČľãĆźãĄőãČŐãČijãČL’åśđæ

äżěäÿŃãĄŇãĂĄãĆłãČijãČŘãČijãČľãĆd’ãČL’ãĄŹãĆŃäÿżãĄłãČąãĆ¡ãČČãČL’ãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

- `__init__(self, attribs, text, userid='*', element=None, brain=None)`

  xmlãĄőèęAçť’ăãĆŠèğčæđŘãĄŮãĄęåśŢéŰŃãĄŮãĄ¿ãĄŹãĂĆxmlãĄőåśđæĂğèÍŸè£řãĄŇ attribs ãĄńãČłãĆźãČĹãĄğãĂĄåĘĚåőźãĄŇ text ãĄğåijŢãĄ■æÿąãĄŢãĆŃãĄ¿ãĄŹãĂĆåśŢéŰŃãĄğãĄ■ãĄłãĄĐåăť’åŘĹãĄŕå£ĚèęĄã

- `def equivalent(self, other)`

  åĞęçŘĘèęAçť’ăãĄŇäżŰãĄőèľŢä¿ąèęAçť’ăãĄÍç■L’ä¿ąãĄŃãĄľãĄĘãĄŃãĆŠåĹd’åőŽãĄŮãĄ¿ãĄŹãĂĆ

- `def equals(self, client_context, words, word_no)`

  åŕ¿èśąæŰĞå■ŮåĹŮãĄŇèęAçť’ăãĄőãČńãČijãČńãĄńãČđãČČãČąãĄŹãĆŃãĄŃãĄľãĄĘãĄŃãĆŠåĹd’åőŽãĄŮãĄ¿ãĄŹãĂĆw ãĄğå■Ÿèłđå■Ÿä¡■ãĄőåĹĘåL’šãČłãĆźãČĹãĂĄword_no ãĄğèľŢä¿ąéŰŃåğŇä¡■ç¡őãĄŇåijŢãĄ■æÿąãĄŢãĆŃãĄ¿ãĄŹãĂĆ åĹd’åőŽçţŘæđIJãĄŕ EqualsMatchãĆŕãČľãĆźïijĹprogramy.parser.pattern.matcher.EqualsMatchïijL’ãĄğè£ŤãĄŮãĂĄEqualsM True/False ãĆŠèÍ■åőŽãĄŮãĄ¿ãĄŹãĂĆ

- `def to_string(self, verbose=True)`

  ãČĞãČŘãČČãĆŕãĆĎãČ■ãĆőãČşãĆŕãĄőåĞžåŁŻãĄőçĆžãĄńãĂĄèęAçť’ăæČĚåăśãĆŠæŰĞå■ŮåĹŮèąĺçŔ¿ãĄńåd’L’æŔŻãĄŮ

- `def to_xml(self, client_context, include_user=False)`

  èęAçť’ăãĄőåĘĚåőźãĆŠXMLå¡ćåijŔãĄńåd’L’æŔŻãĄŮãĄ¿ãĄŹãĂĆXMLå¡ćåijŔãĄő *Braintree* ãĆŠåĞžåŁŻãĄŹãĆŃåăť’åŘĹãĄńåĹl’çŤĺãĄŮãĄ¿ãĄŹãĂĆ

CHAPTER 21

ãĆńãĆźãĆ£ãČătemplateèęĄçťă

åŕ¿èľśãĆĺãČşãĆÿãČşãĄŕ templateèęĄçťăãĄĺãĄŮãĄęãĂĄtem-
plate_nodes.confãĆŠåŘńãĆĂãĆůãĆźãČĘãČăãĄğåőŽç¿ľãĄŢãĆŃãĄ§åĚĺãĄęãĄőAIMLãĆ£ãĆřãĆŠãĆţãČİãČijãČĹãĄŮãĄ¿ãĄŹãĂ
template_nodes.conf
ãĆŠåď'L'æŻť'ãĄŹãĆŃãĄŞãĄĺãĄğãĂĄèęĄçť'ăãĄńåŕ¿å£IJãĄŹãĆŃåĞęçŘĘãĆŕãČľãĆźãĆŠåď'L'æŻť'ãĄŮãĄ§ãĆŁãĂĄçŃňèĞłãĄőè

èęĄçt'ăãĄőåő§èčĚãĆŠåd'L'æŻt'ãĄŹãĆŃãĄĺãĂĄãČŠãČijãĆţãĄŇåŃŢä¡IJãĄŮãĄłãĄŔãĄłãĄčãĄ§ãĆŁãČŠãČŢã

èęĄçť'ăæŕŐãĄńäżěäÿŃãĄőèÍŸè£řãĆŠåĹŮèÍŸãĄŮãĄ¿ãĄŹãĂĆ

```
AIMLãĆ£ãĆřåŘ■ = pythonåĞęçŘĘãĆŕãČl'ãĆźãĄőãČŠãĆź
```

ïijŁèÍŸè£řä¿Ń

```
word = programy.parser.template.nodes.word.TemplateWordNode
authorise = programy.parser.template.nodes.authorise.TemplateAuthoriseNode
random = programy.parser.template.nodes.rand.TemplateRandomNode
condition = programy.parser.template.nodes.condition.TemplateConditionNode
srai = programy.parser.template.nodes.srai.TemplateSRAINode
sraix = programy.parser.template.nodes.sraix.TemplateSRAIXNode
get = programy.parser.template.nodes.get.TemplateGetNode
set = programy.parser.template.nodes.set.TemplateSetNode
map = programy.parser.template.nodes.map.TemplateMapNode
bot = programy.parser.template.nodes.bot.TemplateBotNode
think = programy.parser.template.nodes.think.TemplateThinkNode
normalize = programy.parser.template.nodes.normalise.TemplateNormalizeNode
denormalize = programy.parser.template.nodes.denormalise.TemplateDenormalizeNode
person = programy.parser.template.nodes.person.TemplatePersonNode
person2 = programy.parser.template.nodes.person2.TemplatePerson2Node
gender = programy.parser.template.nodes.gender.TemplateGenderNode
sr = programy.parser.template.nodes.sr.TemplateSrNode
id = programy.parser.template.nodes.id.TemplateIdNode
size = programy.parser.template.nodes.size.TemplateSizeNode
vocabulary = programy.parser.template.nodes.vocabulary.TemplateVocabularyNode
eval = programy.parser.template.nodes.eval.TemplateEvalNode
explode = programy.parser.template.nodes.explode.TemplateExplodeNode
implode = programy.parser.template.nodes.implode.TemplateImplodeNode
program = programy.parser.template.nodes.program.TemplateProgramNode
```

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```
lowercase = programy.parser.template.nodes.lowercase.TemplateLowercaseNode
uppercase = programy.parser.template.nodes.uppercase.TemplateUppercaseNode
sentence = programy.parser.template.nodes.sentence.TemplateSentenceNode
formal = programy.parser.template.nodes.formal.TemplateFormalNode
that = programy.parser.template.nodes.that.TemplateThatNode
thatstar = programy.parser.template.nodes.thatstar.TemplateThatStarNode
topicstar = programy.parser.template.nodes.topicstar.TemplateTopicStarNode
star = programy.parser.template.nodes.star.TemplateStarNode
input = programy.parser.template.nodes.input.TemplateInputNode
request = programy.parser.template.nodes.request.TemplateRequestNode
response = programy.parser.template.nodes.response.TemplateResponseNode
date = programy.parser.template.nodes.date.TemplateDateNode
interval = programy.parser.template.nodes.interval.TemplateIntervalNode
system = programy.parser.template.nodes.system.TemplateSystemNode
extension = programy.parser.template.nodes.extension.TemplateExtensionNode
learn = programy.parser.template.nodes.learn.TemplateLearnNode
learnf = programy.parser.template.nodes.learnf.TemplateLearnfNode
first = programy.parser.template.nodes.first.TemplateFirstNode
rest = programy.parser.template.nodes.rest.TemplateRestNode
log = programy.parser.template.nodes.log.TemplateLogNode
oob = programy.parser.template.nodes.oob.TemplateOOBNode
xml = programy.parser.template.nodes.xml.TemplateXMLNode
addtriple = programy.parser.template.nodes.addtriple.TemplateAddTripleNode
deletetriple = programy.parser.template.nodes.deletetriple.TemplateDeleteTripleNode
select = programy.parser.template.nodes.select.TemplateSelectNode
uniq = programy.parser.template.nodes.uniq.TemplateUniqNode
search = programy.parser.template.nodes.search.TemplateSearchNode
```

æŰřãĄ§ãĄłtemplateèęAçt'ăăĆŠä¡IJæĹŘãĄŹãĆŃåăt'åŘĹãĂĄprogramy.parser.template.nodes.base.TemplateNode ãĆŠå§žåžŢãĆŕãČl'ãĆźãĄĺãĄŮãĄęçűŹæL'£ãĄŮãĄ¿ãĄŹãĂĆ

æIJňå§žåžŢãĆŕãČl'ãĆźãĆŠçűŹæL'£ãĄŹãĆŃãĄŞãĄĺãĄğãĂĄAIMLãĄőXMLèęAçt'ăăĆŠtemplateãĆŕãČl'ãĆźãĄőãČŐãČijãČL'åśđ

ãĆłãČijãČŘãČijãČl'ãĆd'ãČL'ãĄŹãĆŃäÿżèęĄãĄłãČąãĆ¡ãČČãČL'ãĄńãĄŕãĂĄäžëäÿŃãĄőãĆĆãĄőãĄŇãĄĆãĆŁãĄ¿ãĄŹãĂĆ

- `def parse_expression(self, graph, expression)`

  xmlãĄőèęAçt'ăăĆŠèğčæđŘãĄŮãĄęåśŢéŮŃãĄŮãĄ¿ãĄŹãĂĆAIMLãČŚãČijãĆţãĄőçŠřåćČãĄŇ graph ãĄğãĂĄèl'šå¡ŞãĆ£ãĆŕãĄőxmlèęAçt'ăăĄŇ expression ãĄğåijŢãĄ■æÿąãĄŢãĆŃãĄ¿ãĄŹãĂĆåśŢéŮŃãĄğãĄ■ãĄłãĄĐåăt'åŘĹ

- `def resolve_to_string(self, client_context)`

  èęAçt'ăăĄőåĘĚåőźãĆŠæŰĞå■ŮåĹŮ(å£IJç■ŤæŰĞ)ãĄńåśŢéŮŃãĄŮãĄ¿ãĄŹãĂĆå¿Ňè£řãĄő resolve() ãĄńãĆĹãĄčãĄęåŚijãĄşåĞžãĄŢãĆŃãĄ¿ãĄŹãĂĆ

- `def resolve(self, client_context)`

  åĂŃãĂĚãĄőtemplateèęAçt'ăăĆŠæŰĞå■ŮåĹŮãĄńåśŢéŮŃãĄŹãĆŃãĄ§ãĆĄãĄńãĂĄbrainãĄńãĆĹãĄčãĄęåŚijãĄşåĞžãĄŢã resolve() ãĆŠåő§èąŇãĄŮãĄęçţŘæđIJæŰĞå■ŮåĹŮãĆŠçŤ§æĹŘïijĹçţŘåŘĹïijL'ãĄŮãĄ¿ãĄŹãĂĆ

- `def to_string(self)`

  ãČĞãČŘãČČãĆŕãĆĎãČ■ãĆőãČşãĆŕãĄőåĞžåŁŻãĄőçĆžãĄńãĂĄèęAçt'ăæČĚåăśãĆŠæŰĞå■ŮåĹŮèąĺçŔ¿ãĄńåd'L'æŔŻãĄŮ

- `def to_xml(self, client_context)`

  èęAçt'ăăĄőåĘĚåőźãĆŠXMLå¡ćåijŔãĄńåd'L'æŔŻãĄŮãĄ¿ãĄŹãĂĆãĄŞãĆŃãĄŕãĂĄ*learnf/learnf* ãĄőçţŘæđIJãĄĺãĄŮãĄęaimlãČŢãĆąãĆd'ãČńãĆŠã¡IJæĹŘãĄŹãĆŃéŽŻãĄńåĹl'çŤĺãĄŮãĄ§ãĆŁãĂĄXMLå¡ćåijŔãĄő *Braintree* ãĆŠåĞžåŁŻãĄŹãĆŃåăt'åŘĹãĄńåĹl'çŤĺãĄŮãĄ¿ãĄŹãĂĆ

CHAPTER 22

ãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČş

22.1 ãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşãČŢãĆąãĆd'ãČń

ãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşãČŢãĆąãĆd'ãČńãĄŕãĂĄåŕ¿èl'śåĞęçŘĘãĆŠèąŇãĄĘãĄ§ãĆĄãĄőægŃæĹŘãČżåĞęçŘĘæŰź

- åŕ¿èl'śçŤĺãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşãČŢãĆąãĆd'ãČń ïijŽ åŕ¿èl'śãĆĺãČşãĆÿãČşãĄőægŃæĹŘãČżåĞęçŘĘæŰźåij
- ãČ■ãĆřåĞžåŁŻçŤĺãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşãČŢãĆąãĆd'ãČń ïijŽ åŕ¿èl'śãĆĺãČşãĆÿãČşãĄőãČ■ãĆřåĞžåŁŻãĄőæŰźåijŔãĆŠæŇĞåőŽãĄŹãĆŃãČŢãĆąãĆd'ãČńãĂĆïijĹäžéźĆ■ãĂĄâĂŹãČ■ãĆ

ãĆşãČşãČŢãĆčãĆřãČŢãĆąãĆd'ãČńãĄŕãĂĄåŕ¿èl'śãĆĺãČşãĆÿãČşãĄőètůåŃŢæŹĆãĄńãĂĄ–configãĆłãČŮãĆůãČğãČşãĄğãĂĄãĆş

ãČ■ãĆřãĆşãČşãČŢãĆčãĆřãĄŕãĂĄåŕ¿èl'śãĆĺãČşãĆÿãČşãĄőètůåŃŢæŹĆãĄńãĂĄ–loggingãĆłãČŮãĆůãČğãČşãĄğãĂĄãČ■ãĆřãĆş

ãĆşãČşãČŢãĆčãĆřãČŢãĆąãĆd'ãČńãĄğæŇĞåőŽãĄğãĄ■ãĆŃãČŢãĆl'ãČijãČđãČČãČĹãĄŕãĂĄ.yamlãĂĄ.jsonãĂĄ.xmlãĄőãĄĎã
--cformatãĆłãČŮãĆůãČğãČşãĄğãČŢãĆl'ãČijãČđãČČãČĹãĆŠæŇĞåőŽãĄŹãĆŃãĄŃãĂĄ-
–configãĆłãČŮãĆůãČğãČşãĄğæŇĞåőŽãĄŹãĆŃãĆşãČşãČŢãĆčãĆřãČŢãĆąãĆd'ãČńãĄőæŃąåijţå■ŘãĄŃãĆĽ'ãČŢãĆl'ãČijãČđãČČ

ètůåŃŢãĆşãČđãČşãČĽ'ä¿Ń

```
python3 ../../src/programy/clients/console.py --config ./config.yaml --cformat␣
↪yaml --logging ./logging.yaml
```

22.2 ãĆşãČđãČşãČĽ'ãČl'ãĆd'ãČşãĆłãČŮãĆůãČğãČş

ètůåŃŢæŹĆãĄńæŇĞåőŽãĄŹãĆŃãĆşãČđãČşãČĽ'ãČl'ãĆd'ãČşãĆłãČŮãĆůãČğãČşãĄńãĄŕãĂĄäžěäÿŃãĄőãĆĆãĄőãĄŃãĄĆãĆŁã

ãĄŞãĄőãĆşãČđãČşãČĽ'ãČl'ãĆd'ãČşãĆłãČŮãĆůãČğãČşãĄŕãĂĄåĚĺãĄęãĄőclientãĄğåŘŇãĄŸãĆłãČŮãĆůãČğãČşæŇĞåőŽãĆŠèą

- --config [ãĆşãČşãČŢãĆčãĆřãČŢãĆąãĆď'ãČńãČŠãĆź] ïijŽ clientåő§èąŇæŹĆãĄńä¡£çŤĺãĄŹãĆŃãĆşãČşãČŢãĆčãĆřãČŢãĆąã
- --cformat [yaml|json|xml] ïijŽ ãĆşãČşãČŢãĆčãĆřãČŢãĆąãĆď'ãČńãĄőãČŢãĆĺ'ãČijãČđãČČãČĹãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂ
- --logging [ãČ■ãĆřãĆşãČşãČŢãĆčãĆřãČŠãĆź] ïijŽ ãČ■ãĆřãĆşãČşãČŢãĆčãĆřãĄőãČŢãĆąãĆď'ãČńãČŠãĆźãĆŠæŇĞåőŽãĄŮ
- --noloop ïijŽ åŕ¿èľ śåĞęçŘĘãČńãČijãČŮãĆŠåő§èąŇãĄŮãĄłãĄĎãĆłãČŮãĆůãČğãČşãĄğãĄŹãĂĆãĆşãČşãČŢãĆčãĆřãČŢãĆ
- -âĂŤsubs ïijŽ äžčæŻ£ãĄĹåijŢæŢřèĺ■åőŽãČŢãĆąãĆď'ãČńãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆãĆşãČşãČŢãĆčãĆřãČŢãĆąãĆď'ãČń *ãĆşãČđãČşãČĽ'ãČĺ'ãĆď'ãČşãĆłãČŮãĆůãČğãČşãĄőç¡őæŔŻ* ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăãĄŢãĄĎãĂĆ

éĂŽä£ąçşžãĄőclientãĄğãČńãĆźãČİãČşãĆźåĘĚãĄńäžŸåŁäæČĚåăśãĆŠæăijçt'■ãĄŹãĆŃåăt'åŘĹãĄőãĆłãČŮãĆůãČğãČşãĄĺãĄŮãA

- -âĂŤversion ïijŽ åŕ¿èľ śãĆĺãČşãĆÿãČşãĄőversionåŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆãČńãĆźãČİãČşãĆźåĘĚãĄńãĂĄ{âĂIJve âĂIJversionåŘ■âĂİ} ãĄőå¡ćåijŔãĄğæăijçt'■ãĄŢãĆŃãĄ¿ãĄŹãĂĆæIJłæŇĞåőŽãĄőåăt'åŘĹãĄńãĄŕãĂĄãČńãĆźãČİãČşãĆźã

22.3 ãĆşãČşãČŢãĆčãĆřãČŢãĆąãĆď'ãČń

ãĆşãČşãČŢãĆčãĆřãČŢãĆąãĆď'ãČńãĄŕãĂĄèd'ĞæŢřãĄőãĆżãĆŕãĆůãČğãČşãĄğæğŃæĹŘãĄŢãĆŃãĄęãĄŁãĆŁãĂĄåd'ğãĄ■ãĄŔå

- client : ãĆćãČŮãČłãĆśãČijãĆůãČğãČşåśd'ãĄĺãĄŮãĄęãĄőæğŃæĹŘãĄńéŰćãĄŹãĆŃåőŽç¿l'ãĆŠèąŇãĄĘãĆżãĆŕãĆůãČğãČ
- bot : åŕ¿èľ śèęĄæśĆãĄńåŕ¿ãĄŮãĄęãĂĄåŕ¿èľ śåĞęçŘĘåĚĺä¡ŞãĄőåĹűå¿ąãĆŠèąŇãĄĘåśd'ãĄğãĂĄçŹžèľ śæŰĞãĄőåĹĘèğčãĆ
- brain : çŹžèľ śæŰĞæŕŐãĄőãČđãĆČãĆĄåĞęçŘĘãĆĎãĆůãČŁãČłãĆłãĆŠåő§èąŇãĄŹãĆŃåśd'ãĄğãĂĄèęĄçt'ãæŕŐãĄőåŃŢä¡

clientãĄőãĆżãĆŕãĆůãČğãČşãĄğãĄŕãĂĄãĆćãČŮãČłãĆśãČijãĆůãČğãČşïijĹãĆŕãČl'ãĆd'ãĆćãČşãČĹãĆćãČŮãČłïijL'ãĄĺãĄŮãĄęãA

åŃŢä¡IJå¡ćæĚŃãĄńãĄŕãĂĄãĆşãČşãĆ¡ãČijãČńèţůåŃŢãĆĎãĂĄRESTéĂŽä£ąç■L'ãĄőæğŸãĂĚãĄłãĆd'ãČşãĆ£ãČŢãĆğãČijãĆźãA

ãĄŞãĆŇãĄńãĆĹãĆŁãĂĄïijŚãĄd'ãĄőãĆşãČşãČŢãĆčãĆřãČŢãĆąãĆď'ãČńãĄńèd'ĞæŢřãĄőãĆŕãČl'ãĆd'ãĆćãČşãČĹãĆćãČŮãČłçŤ

ïijĹãĆŕãČl'ãĆd'ãĆćãČşãČĹãĆćãČŮãČłåĄt'ãĄŃãĆL'ãĆŕãČl'ãĆd'ãĆćãČşãČĹåŘ■ãĆŠæŇĞåőŽãĄŹãĆŃãĄŞãĄĺãĄğãĂĄåŕ¿å£IJãA

clientãĄőãĆżãĆŕãĆůãČğãČşãĄőåĚśéĂŽçŽĎãĄłåőŽç¿l'ãĄĺãĄŮãĄęãĂĄäžëäÿŃãĄőéäĚçŻőãĄŃèęŔåőŽãĄŢãĆŃãĄęãĄĐãĄ¿ãĄŹ

- description ïijŽ clientãĄńéŰćãĄŹãĆŃèłňæŸŐæŰĞãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
- renderer ïijŽ åŕ¿èľ śçţŘæđIJãĄńåŕ¿ãĄŹãĆŃçůĺéŻĘç■L'ãĆŠèąŇãĄĘåăt'åŘĹãĄőåĞęçŘĘãĆŕãČl'ãĆźãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹ
- bot ïijŽ clientãĄŃåĹl'çŤĺãĄŹãĆŃbotåőŽç¿l'ãĄőåŘ■çğŕãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĄŃãĂĄåĘĚéĆĺåĞęçŘĘãĄĺãĄŮãĄęâĄŹ
- bot_selector ïijŽ èd'ĞæŢřãĄőbotãĄŃå■ŸåIJĺãĄŹãĆŃåăt'åŘĹãĄőãĆżãČńãĆŕãĆ£ãČijãĄőåĞęçŘĘãĆŕãČl'ãĆźãĆŠæŇĞåőŽã

åŘĹãĂĄãĆćãČŮãČłãĆśãČijãĆůãČğãČşãĄőåŃŢä¡IJçŠŕåćĆãĄńå£IJãĄŸãĄ§åĂŃåĹĕãĄőéäĚçŻőãĆĆå£ĚèęĄãĄńå£IJãĄŸãĄęåőŽç

ãĆşãČşãĆ¡ãČijãČńãĆŕãČl'ãĆd'ãĆćãČşãČĹãĄőåĂŃåĹĕåőŽç¿l'ä¿Ń

```
console:
    description: Program-Y Console Client
    prompt: ">>>"
```

RESTéĂŽä£ąãĆŕãČl'ãĆd'ãĆćãČşãČĹãĄőåĂŃåĹĕåőŽç¿l'ä¿Ń

```
yadlan:
    description: Program-Y REST Client
    host: 0.0.0.0
    port: 5100
    debug: false
    workers: 4
    config_key: false
```

ãĄŢãĆL'ãĄńãĂĄclientãĆżãĆŕãĆůãČğãČşãĄńãĄŕãĂĄåŕ¿èľ'śåĞęçŘĘãĄğä¡£çŤĺãĄŹãĆŃãČŢãĆąãĆd'ãČńçŠřáćČãĄńéŰćãĄŹãĆŃãèľşçt'řãĄńãĄd'ãĄĎãĄęãĄŕãĂĄ*ãČŢãĆąãĆd'ãČńçőąçŘĘ* ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăãŢãĄĎãĂĆ

botãĄõãĆżãĆŕãĆůãČğãČşãĄńãĄŕãĂĄäžëäÿŃãĄõãĆţãČŰãĆżãĆŕãĆůãČğãČşãĄŇãĄĆãĆŁãĄ¿ãĄŹãĂĆ

- *BotãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČş*
  - conversations ïijŽ åŕ¿èľ'śåśëæ■t'ãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ
  - splitter ïijŽ çŹžèľ'śæŰĞãĄőåĹĘèğčãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ
  - joiner ïijŽ å£IJç■ŤæŰĞçŤ§æĹŘæŹĆãĄőçţĆçńŕæŰĞå■ŮãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ
  - spelling ïijŽ ãĆźãČŽãČńãČĄãĆğãČČãĆŕãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ
  - translation ïijŽ ç£žèĺşåĹűå¿ąãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ
  - sentiment ïijŽ æĎ§æČĚåĹd'åőŽãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ

brainãĄõãĆżãĆŕãĆůãČğãČşãĄńãĄŕãĂĄäžëäÿŃãĄõãĆţãČŰãĆżãĆŕãĆůãČğãČşãĄŇãĄĆãĆŁãĄ¿ãĄŹãĂĆ

- *BrainãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČş*
  - overrides ïijŽ æl'§èČ¡æŃąåijţãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ
  - defaults ïijŽ åŔŰå¿Ůåd'śæŢŮæŹĆç■L'ãĄődefaultæŰĞå■ŮåĹŮãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ
  - binaries ïijŽ ãĆůãČŁãČłãĆłãĄõãČŘãĆd'ãČŁãČłãČĞãČijãĆ£åĹl'çŤĺãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹã
  - braintree ïijŽ ãĆůãČŁãČłãĆłãĄõãČĂãČşãČŮåĞžåŁŻãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ
  - services ïijŽ SubAgentéĂčæŘžæl'§èČ¡ãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ
  - nlu ïijŽ NLUéĂŽä£ąãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ
  - security ïijŽ åĹl'çŤĺåĹűéŹŘãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ
  - oob ïijŽ OOB(Out of Band)åĞęçŘĘãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ
  - dynamic ïijŽ åŃŢçŽĎãČĞãČijãĆ£åĞęçŘĘãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ
  - tokenizer ïijŽ å■Ÿèłđå ĹĘèğčãĆĎæŰĞå■ŮåĹŮçţŘåŘĹãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ
  - debugfiles ïijŽ çŢřåÿÿæČĚåăśãĄõåĞžåŁŻãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l'ãĄŮãĄ¿ãĄŹãĂĆ

22.4 ãČ■ãĆřãĆşãČşãČŢãĆčãĆř

ãČ■ãĆřãĆşãČşãČŢãĆčãĆřãĄńãĄd'ãĄĎãĄęãĄŕãĂĄ *ãČ■ãĆřèĺ■åőŽ*ãĂĂãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăãŢãĄĎãĂĆ

CHAPTER 23

ãĆşãČşãČŢãĆčãĆřãĄőç¡őæŔŻ

23.1 ãČľãĆďãĆżãČşãĆźãĆ■ãČijãĄőç¡őæŔŻ

license.keysãĄőèĺ■åőŽåĂďãĆŠç¡őæŔŻãĄŹãĆŃæľ§èČ¡ãĄğãĄŹãĂĆ

`LICENSE_KEY:VALUE`
ãĆŠãĆşãČşãČŢãĆčãĆřãĄőæğŃæĹŘãĆćãĆďãČĘãČăãĄńæŇĞåőŽãĄŮãĄ§åăťåŘĹãĄńãĂĄlicense.keysãĄőåĂďãĄŇç¡őæŔŻãĄŮ

èĺ■åőŽä¿Ń

äżěäÿŇãĄőãĆĹãĄĘãĄńãĂĄãĆşãČşãČŢãĆčãĆřãČŢãĆąãĆďãČńãĄń `LICENSE_KEY:VALUE`
ãĄĺèĺŸèijL'ãĄŮãĄęãĄŁãĄ■ãĄ¿ãĄŹãĂĆ

`LICENSE_KEY:` ãĄŕåŻžåőŽåĂďãĄğãĂĄ `VALUE`
ãĄŕlicense.keysãĄńèĺŸèijL'ãĄŹãĆŃãĆ■ãČijåŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ

```
client:
  email:
    username: LICENSE_KEY:EMAIL_USERNAME
    password: LICENSE_KEY:EMAIL_PASSWORD
```

license.keysãĄńäżěäÿŇãĄőãĆĹãĄĘãĄńèĺŸèijL'ãĄŹãĆŃãĄĺãĂĄåő§èąŇæŹĆãĄńäÿŁèĺŸãĄőLICENSE_KEY:VALUEãĆŠlicense.

```
EMAIL_USERNAME=sample@somewere.com
EMAIL_PASSWORD=qwerty
```

gitãĆŠåĹ'çŤĺãĄŹãĆŃåăť'åŘĹãĂĄlicense.keysãĆŠ.gitignoreãĄńèĺ■åőŽãĄŹãĆŃãĄŞãĄĺãĄğæĎŔåŻşãĄŻãĄŽçŹżéŇšãĄŮãĄęãĄ

23.2 ãĆşãČđãČşãČL'ãČľãĆďãČşãĆłãČŮãĆůãČğãČşç¡őæŔŻ

substitutions.txtãČŢãĆąãĆďãČńãĆŠãĆşãČđãČşãČL'ãČľãĆďãČşåijŢæŢřãĄńãĄŮãĂĄår¿èľśãĆĺãČşãĆÿãČşãĆŠèţůåŃŢãĄŹãĆŃãĄ
ãĆşãČđãČşãČL'ãČľãĆďãČşãĆłãČŮãĆůãČğãČş –subs
ãĄğæŇĞåőŽãĄŮãĄ§ãČŢãĆąãĆďãČńãĄğç¡őæŔŻãĆŠèąŇãĄĐãĄ¿ãĄŹãĂĆ

èÍ■åőŽä¿Ń

äżěäÿŃãĄőãĆĹãĄĘãĄńãĂĄãĆşãČşãČŢãĆčãĆřãČŢãĆąãĆď’ãČńãĄń $ +VALUE
ãĄÍèÍŸèijL’ãĄŮãĄęãĄŁãĄ■ãĄ¿ãĄŹãĂĆ
VALUEãĄŕsubstitutions.txtãĄńèÍŸèijL’ãĄŹãĆŃãĆ■ãČijåŘ■ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ

```
client:
  email:
    host: $EMAIL_HOST
    port: $EMAIL_PORT
```

substitutions.txtãĆŠäżěäÿŃãĄőãĆĹãĄĘãĄńèÍŸèijL’ãĄŹãĆŃãĄÍãĂĄåő§èąŇæŹĆãĄńäÿŁèÍŸãĄő$VALUEãĆŠsubstitutions.txtãĄ

```
$EMAIL_HOST:prod_server.com
$EMAIL_PORT:9999
```

ãĄŞãĆŇãĄńãĆĹãĆŁãĂĄ `--subs substitutions.txt` ãĄÍèţůåŃŢæŹĆãĄńç¡őæŘŻãČłãĆźãČĹãĆŠèÍ■åőŽãĄŹãĆŃãĄăãĄŞ

CHAPTER 24

ãČ■ãĆřèĺ■åőŽ

åf¿èl'śãĆĺãČşãĆÿãČşãĄőãČ■ãĆřåĞžåŁŻãĄfãĂĄPythonãĄőãČ■ãĆőãČşãĆřæl'§èČ¡ãĆŠçŤĺãĄĎãĄęèąŇãĄĎãĄ¿ãĄŹãĂĆ
ãČ■ãĆřèĺ■åőŽãĆłãČŮãĆůãČğãČşãĆŠæŇĞåőŽãĄŹãĆŃæŰźæşŢãĄőèl'şçt'řãĄńãĄd'ãĄĎãĄęãĄfãĂĄ
PythonãČ■ãĆőãČşãĆřãČL'ãĆ■ãČěãČąãČşãČĹ ãĆŠåŔĆçĚğãĄŮãĄęãĄŔãĄăãĄŢãĄĎãĂĆ

äžěäÿŇãĄfãĂĄãČ■ãĆřãĆşãČşãČŢãĆčãĆřãĄőæŇĞåőŽãĄĺãĄŮãĄęãĂĄ/tmp/y-bot.logãĄńãČ■ãĆřåĞžåŁŻãĄŹãĆŃèĺ■åőŽä¿ŇãĄğ

```
version: 1
disable_existing_loggers: False

formatters:
  simple:
    format: '%(asctime)s  %(name)-10s %(levelname)-7s %(message)s'

handlers:
  file:
    class: logging.handlers.RotatingFileHandler
    formatter: simple
    filename: /tmp/y-bot.log

root:
  level: DEBUG
  handlers:
      - file
```

CHAPTER 25

Bot ãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČş

botãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşãĄńãĄŕåĚśéĂŽåőŽç¿l’ãĄÍæl’§èČ¡åĹĕåőŽç¿l’ãĄŇãĄĆãĆŁãĂĄåĚśéĂŽåőŽç¿l’ãĄğãĄŕã

- *æğŃœĹŘœČĚåăśåőŽç¿l’*
- *å£IJç■ŤœŰĞåőŽç¿l’*
- *åĹűéŹŘåĂd’åőŽç¿l’*
- *èţůåŃŢçţĆäžĘœŰĞåőŽç¿l’*

ãĄ¿ãĄ§ãĂĄæl’§èČ¡åĹĕãĄńãĂĄbotãĄőœŰĞå■ŮåĹŮåĞęçŘĘãĆĎãĂĄäżŸåŁăæl’§èČ¡ãĄńéŰćãĄŹãĆŃæŇĞåőŽãĆŠèąŇãĄĘçĆžã

- *conversations* ïijŽ åŕ¿èl’śåśěæ■t’ãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l’ãĄŮãĄ¿ãĄŹãĂĆ
- *splitter* ïijŽ çŹžèl’śæŰĞãĄőåĹĘèğčãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l’ãĄŮãĄ¿ãĄŹãĂĆ
- *joiner* ïijŽ å£IJç■ŤæŰĞçŢ§æĹŘœŹĆãĄőçţĆçńŕæŰĞå■ŮãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l’ãĄŮãĄ¿ãĄŹãĂĆ
- *spelling* ïijŽ ãĆźãČŽãČńãČĄãĆğãČČãĆŕãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l’ãĄŮãĄ¿ãĄŹãĂĆ
- *translation* ïijŽ ç£żèĺşåĹűå¿ąãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l’ãĄŮãĄ¿ãĄŹãĂĆ
- *sentiment* ïijŽ æĎ§æČĚåĹd’åőŽãĄńéŰćãĄŹãĆŃéăĚçŻõãĆŠåőŽç¿l’ãĄŮãĄ¿ãĄŹãĂĆ

ãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşãĄőèÍŸè£řæŰźæşŢãĄŕãĂĄyamlãČŢãĆl’ãČijãČđãĆČãČĹãĆŠä¿ŇãĄńèłňæŸŐãĄŮãĄ¿ãĄŹ
jsonãĄŁãĆĹãĄşxmlãĄğãĆĆèÍŸèijL’æŰźæşŢãĄŇçŢřãĄłãĆŃãĄăãĄŚãĄğåŘ■çğřãĄŕåŘŇãĄŸãĄÍãĄłãĆŃãĄ§ãĆĄãĂĄjsonãĄŁãĆ

èĺ■åőŽä¿Ń

```
bot:
    version: v1.0
    brain: brain

    default_response: unknown
    default_response_srai: YEMPTY
    exception_response: Exception
    empty_string: YEMPTY

    max_question_recursion: 1000
    max_question_timeout: 60
    max_search_depth: 100
    max_search_timeout: 60
    max_search_condition: 20
```

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```
    max_search_srai: 50
    max_categories: 20000
    max_properties: 10000

    initial_question: ãĄŁãĄŕãĆĹãĄĘãĂĆ
    initial_question_srai: ãĆşãČşãČŘãČşãČŕ
    exit_response: çţĆäžĘãĄŮãĄ¿ãĄŹãĂĆ
    exit_response_srai: YEXITRESPONSE

    conversations:
        initial_topic: '*'
        max_histories: 100

    splitter:
        classname: programy.dialog.splitter.splitter_jp.SentenceSplitter
        split_chars: ãĂĆ

    joiner:
        classname: programy.dialog.joiner.joiner_jp.SentenceJoiner
        join_chars: .?!ãĂĆïij$ïijĄ
        terminator: ãĂĆ

    spelling:
        classname: programy.spelling.norvig.NorvigSpellingChecker
        alphabet: ABCDEFGHIJKLMNOPQRSTUVWXYZ
        check_before: false
        check_and_retry: false

    translation:
        classname: programy.translate.textblob_translator.TextBlobTranslator
        from: EN
        to: JP

    sentiment:
        classname: programy.sentiment.textblob_sentiment.TextBlobSentimentAnalyse
        scores: programy.sentiment.scores.SentimentScores
```

25.1 åĚśéĂŽåőŽç¿ľéăĚçŻő

25.1.1 æğŃæĹŘæČĚåăśåőŽç¿ľ

botãĄőå§žæIJňæČĚåăśãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ

Table 1: èĺ■åőŽéăĚçŻőäÿĂèęğ

èĺ■åőŽåĂď	åĘĚåőź	åĹĺæIJ§åĂď
version	templateãĄő *program* èęĄçť ăãĄğåĞžåŁŻãĄŹãĆŃãČŘãČijãĆ propertiesãĄńèĺŸèijL'ãĄŹãĆŃ *version* ãĄŇãĂĄæIJňèĺ■åőŽãĆĹãĆŁãĆĆåĎłåĚĹãĄŮãĄęä¡£çŤĺãĄŢãĆŃãĄ¿ãĄŹãĂĆ	
brain	botãĄŇåĹľçŤĺãĄŹãĆŃbrainåőŽç¿ľãĄőåŘ■çğřãĂĆïijĹâĂŽbrainâĂŹåŽžåőŽãĄğãĂĄđ	
brain_selector	èď'ĞæŢřãĄőbrainãĄŇå■ŸåIJĺãĄŹãĆŃåăť'åŘĹãĄőãĆžãČňãĆ(ãĄ£ãĄČijãĄőåĞęçŘĘãĆŕã	
tab_parse_output	ãČŠãĆ£ãČijãČşãČđãČČãČĄæŹĆãĄőãČ■ãĆŕåĞžåŁŻãĄğãĂĄąđśåžęèąĺçŔ¿çŤĺãĄőãĆ£	

25.1.2 å£IJç■ŤæŰĞåőŽç¿ľ

å£IJç■ŤæŰĞçŤ§æĹŘæŹĆãĄőãČĞãČŢãĆľãČńãČĹåĞęçŘĘãĄőåĘĚåőźãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ

Table 2: èÍ■åőŽéăĚçŻőäÿÄèęğ

èÍ■åőŽåĂď	åĘĚåőź	åĹÍæIJ§åĂď
default_response_srai	ãČđãČČãČĄãĄŹãĆŃpatternãĄŇãĄłãĄŃãĄčãĄ§åăť'åŘĹãĄńãĄ	
default_response	ãČđãČČãČĄãĄŹãĆŃpatternãĄŇãĄłãĄŃãĄčãĄ§åăť'åŘĹãĄńçŁŤæŰĞãĄ *default-response* ãĄŇãĂĄæIJňèÍ■åőŽãĆĹãĆŁãĆĆåĎłåĚĹãĄŮãĄęä¡£çŤÍãĄŢãĆŇãĄ¿ãĄ	
exception_response	åĞęçŘĘä¿Ńåď'ŰãĄŇçŹžçŤ§ãĄŮãĄ§åăť'åŘĹãĄńè£ŤãĄŹå£IJçŁŤæŰĞãĄŮ *exception-response* ãĄŇãĂĄæIJňèÍ■åőŽãĆĹãĆŁãĆĆåĎłåĚĹãĄŮãĄęä¡£çŤÍãĄŢãĆŇãĄ¿ãĄ	propertiesãĄ
empty_string	pre_processorãĄőåĞęçŘĘçţŘæđIJãĄŇçĎąãĄĎåăť'åŘĹãĄńèÍ■åőŽãĆĹãĆŁãĆĆåĎłåĚĹãĄŮçŹžèľśæŰĞ	

25.1.3 åĹűéŹŘåĂď'åőŽç¿ľ

åŕ¿èľśåĞęçŘĘãĄńãĄŁãĄŚãĆŃãĂĄæŹĆéŰŞãČżæŢřéĞŔãĄńéŰćãĄŹãĆŃåĹűéŹŘåĂď'ãĆŠåőŽç¿ľ'ãĄŮãĄ¿ãĄŹãĂĆ

Table 3: èÍ■åőŽéăĚçŻőäÿÄèęğ

èÍ■åőŽåĂď	åĘĚåőź	åĹÍæIJ§åĂď
max_question_recursion	æŰĞæŐćçţ'ćæIJĂåď'ğåŽđæŢřãĂĆéŢůæŰĞãĄŇåĚěåŁŻãĄŢãĆŃãĂĄåĹĘåL'šæŰĞå■Ůã *exception-response* ãĆŠè£ŤãĄŮãĄ¿ãĄŹãĂĆ	
max_question_timeout	æŰĞæŐćçţ'ćæIJĂåď'ğæŹĆéŰŞãĂĆéŢůæŰĞãĄŇåĚěåŁŻãĄŢãĆŃãĂĄåĹĘåL'šæŰĞå■Ů *exception_response* ãĆŠè£ŤãĄŮãĄ¿ãĄŹãĂĆ	1(åĹűéŹŘãĄłãĄŮ)
max_search_timeout	å■ŸèłđæŐćçţ'ćæIJĂåď'ğæŹĆéŰŞãĆŠçğŠå■Ÿä¡■ãĄğæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆæŰĞæŐ *exception-response* ãĆŠè£ŤãĄŮãĄ¿ãĄŹãĂĆ	1(åĹűéŹŘãĄłãĄŮ)
max_search_depth	å■ŸèłđæŐćçţ'ćåĹĘåšŘæIJĂåď'ğæŢřãĂĆ *ãČŕãĆd'ãČńãČL'ãĆńãČijãČL'* ãĂĄ *set* ç■L'ãĄőæŇĞåőŽãĄğå■ŸèłđãĄőæŐćçţ'ćãĄŇèĘĺåď'ğãĄńãĄłãĄčãĄ§åăť'åŘĹãĄőå■Ÿèłđ *exception-response* ãĆŠè£ŤãĄŮãĄ¿ãĄŹãĂĆ	100
max_search_condition	*conditionèęÁçţ'ăăĄğãĄőloop* ãĄőæIJĂåď'ğåŽđæŢřãĂĆ- conditionãĄőloopèÍŸèijĽæŹĆãĄńcondi- tionãĄőæÍąäżűãĄńãČđãČČãČĄãĄŮãĄłãĄŃãĄčãĄ§åăť'åŘĹçĎąéŹŘãČńãČijãČŮãĄńãA *exception-response* ãĆŠè£ŤãĄŮãĄ¿ãĄŹãĂĆ	100
max_search_srai	*srai* ãĄőæIJĂåď'ğæŐćçţ'ćåŽđæŢřãĂĆs- raiãĄőèÍŸè£řãĄŇåĘ■åÿřåŚijãĄşåĞžãĄŮãĄńãĄłãĄčãĄ§åăť'åŘĹãĄőåĘ■åÿřåŚijãĄşåĞž *exception-response* ãĄőèÍ■åőŽåĂď'ãĆŠè£ŤãĄŮãĄ¿ãĄŹãĂĆ	50
max_categories	æIJĂåď'ğèł■ãĄ£è¿ijãĄ£categoryæŢřãĂĆAIMLãĄőæIJĂåď'ğèł■ãĄ£è¿ijãĄ£categoryæŢ *errors* ãĄődescriptionãĄń `Max categories [n] exceeded` ãĄĺãĄŮãĄęåĞžåŁŻãĄŢãĆŃãĄ¿ãĄŹãĂĆ	3000
max_properties	åĹ'çŤĺåŔŕèČ¡ãĄłãĆřãČ■ãČijãČŘãČńåď'Ľ'æŢřãĄőæIJĂåď'ğæŹĆãĂĆnameåđŃãČždataåđ *exception-response* ãĆŠè£ŤãĄŮãĄ¿ãĄŹãĂĆ	256

25.1.4 èţůåŃŢçţĆäžĘæŰĞåőŽç¿ľ

ãĆşãČşãĆ¡ãČijãČńç■Ľ'ãĄğãĄőåĞęçŘĘãĄőåăť'åŘĹãĄõãĂĄbotèţůåŃŢãČżçţĆäžĘæŹĆãĄőå£IJç■ŤæŰĞãĄńéŰćãĄŹãĆŃåĘĚåőźã

Table 4: èÍ■åőŽéăĚçŻőäÿÄèęğ

èÍ■åőŽåĂď	åĘĚåőź	åĹÍæIJ§åĂď
initial_question_srai	èţůåŃŢæŹĆçŹžèľśæŰĞãĂĆclientèţůåŃŢæŹĆãĄńåĞęçŘĘãĄ	
initial_question	èţůåŃŢæŹĆå£IJç■ŤæŰĞãĂĆinitial_question_sraiãĄńår¿å£IJãĄŹãĆŃãČůãČłãČłãĄ	
exit_response_srai	çţĆäžĘæŹĆçŹžèľśæŰĞãĂĆclientçţĆäžĘæŹĆãĄńåĞęçŘĘãĄ	
exit_response	çţĆäžĘæŹĆå£IJç■ŤæŰĞãĂĆexit_response_sraiãĄńår¿å£IJãĄŹãĆŃãČůãČłãČłãĄŃ	

25.2 conversations

åŕ¿èľśåśěæ■ť ãĄőçőąçŘĘãĄńéŰćãĄŹãĆŃåĹűå¿ąéäĚçŻőãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ

Table 5: èĺ■åőŽéäĚçŻőäÿĂèęğ

èĺ■åőŽåĂď	åĘĚåőź	åĹİæIJ§åĂď
initial_topic	åŕ¿èľśåśěæ■ť ãĄőåĹİåŽđçŤ§æĹŘæŹĆãĄńèĺ■åőŽãĄŹãĆŃTopicãĄőåĹİæIJ§åĂď ãĂĆ
max_histories	åŕ¿èľśåśěæ■ť ãĄőæIJĂåď ğä£İæŇĄæŢřãĂĆ	100

25.3 splitter

åĚěåŁŻãĄŢãĆŇãĄ§çŹžèľśæŰĞãĆŠèď ĞæŢřæŰĞãĄńåĹĘåL'šãĄŹãĆŃãĄ§ãĆĄãĄőåőŽç¿ľãĆŠèąŇãĄĎãĄ¿ãĄŹãĂĆ

Table 6: èĺ■åőŽéäĚçŻőäÿĂèęğ

èĺ■åőŽåĂď	åĘĚåőź	åĹİæIJ§åĂď
classname	åĹľçŤĺãĄŹãĆŃSplitterãĄőåĞęçŘĘãĆŕãČľãĆńãĄĆ	programy.dialog.splitter.regex.RegexSentenceSplitter
split_chars	propertiesãĄńèĺŸèijL'ãĄŹãĆŃ *splitter_split_chars* ãĄŇãĂĄæIJňèĺ■åőŽãĆĹãĆŁãĆĆåĎłåĚĹãĄŮãĄęä¡£çŤĺãĄŢãĆŇãĄ¿ãĄŹãĂĆçŹžèľśæŰĞãĄőåĹĘ	[:;,.?!]

æŮěæIJňèłđãĄğãĄőåŕ¿èľśãĆŠèąŇãĄĘåăť åŘĹãĄńãĄŕãĂĄclassname ãĄńãĂĄâĂŹprogramy.dialog.splitter.splitter_jp.SentenceSplitterâĂŹ ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ

25.4 joiner

æIJĂçţĆçŽĎãĄłå£IJç■ŤæŰĞãĆŠçŤ§æĹŘãĄŹãĆŃéŽŻãĄńãĂĄèď ĞæŢřæŰĞãĆŠçţŘåŘĹãĄŢãĄŽãĆŃãĄ§ãĆĄãĄőåőŽç¿ľãĆŠèąl

Table 7: èĺ■åőŽéäĚçŻőäÿĂèęğ

èĺ■åőŽåĂď	åĘĚåőź	åĹİæIJ§åĂď
classname	åĹľçŤĺãĄŹãĆŃJoinerãĄőåĞęçŘĘãĆŕãČľãĆńãĄĆ	programy.dialog.joiner.joiner.SentenceJoiner
terminator	å£IJç■ŤæŰĞãĄőæIJńåř¿ãĄńäžŸåŁãĄŹãĆŃæŰĞå■ŮãĂĆpropertiesãĄńèĺŸèijL'ãĄŹãĆŃ *joiner_terminator* ãĄŇãĂĄæIJňèĺ■åőŽãĆĹãĆŁãĆĆåĎłåĚĹãĄŮãĄęä¡£çŤĺãĄŢãĆŇãĄ¿ãĄŹãĂĆ	
join_chars	terminaterãĄőäžŸåŁãĂĆŠæŁŚæ■ćãĄŹãĆŃãĂĄå£IJç■ŤæŰĞãĄőæIJńåř¿æŰĞå■Ůç¿d'ãĂĆproperti *joiner_join_chars* ãĄŇãĂĄæIJňèĺ■åőŽãĆĹãĆŁãĆĆåĎłåĚĹãĄŮãĄęä¡£çŤĺãĄŢãĆŇãĄ¿ãĄŹãĂĆ	

æŮěæIJňèłđãĄğãĄőåŕ¿èľśãĆŠèąŇãĄĘåăť åŘĹãĄńãĄŕãĂĄclassname ãĄńãĂĄâĂŹprogramy.dialog.joiner.joiner_jp.SentenceJoinerâĂŹ ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ

25.5 spelling

ãĆźãČŽãČńãČĄãĆğãČČãĆŕãĆŠèąŇãĄĘåăť åŘĹãĄőåőŽç¿ľãĆŠèąŇãĄĎãĄ¿ãĄŹãĂĆ

Table 8: èÍ■åőŽéăĚçŻőäÿĂèęğ

èÍ■åőŽåĂď	åĘĚåőź	åĹİæIJ§åĂď
classname	åĹľçŤĺãĄŹãĆŃãĆźãČŽãČńãČąãĆğãČČãĆńãČijãĄőåĞęçŘĘãĆŕãČľãĆźãĂĆ	(ãĄłãĄŲ)
alphabet	år¿èśąãĄĺãĄłãĆŃãĆćãČńãČŢãĆąãČŹãČČãČĹæŰĞå■Ůç¿ď	(ąĆžæŰĞå■Ů)
check_before	äžŃåL’■ãČĄãĆğãČČãĆŕãĄőåő§æŰ¡æŇĞåőŽãĂĆ	false
check_and_retry	ãČĄãĆğãČČãĆŕçŢřåÿÿæŹĆãĄőåĘ■åĞęçŘĘæŇĞåőŽ	false

25.6 translation

å£IJç■ŤæŰĞãĆŠç£żèĺşãĄŮãĄęè£ŤãĄŹåăť’åŘĹãĄőåőŽç¿ľãĆŠèąÑãĄĎãĄ¿ãĄŹãĂĆ

Table 9: èÍ■åőŽéăĚçŻőäÿĂèęğ

èÍ■åőŽåĂď	åĘĚåőź	åĹİæIJ§åĂď
classname	åĹľçŤĺãĄŹãĆŃTranslatorãĄőåĞęçŘĘãĆŕãČľãĆźãĂĆ	(ãĄłãĄŲ)
from	ç£żèĺşãĄőår¿èśąãĄĺãĄłãĆŃèĺĂèłđçĺőåĹěãĂĆISO-639 èÍĂèłđãĆşãČijãČL’ãĄğæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ	(çľžæŰĞå■Ů)
to	ç£żèĺşå¿ŇãĄőèÍĂèłđçĺőåĹěãĂĆISO-639 èÍĂèłđãĆşãČijãČL’ãĄğæŇĞåőŽãĄŮãĄ¿ãĄŹ	(çľžæŰĞå■Ů)

25.7 sentiment

æĎ§æČĚãĆŠåĹď’åőŽãĄŹãĆŃåăť’åŘĹãĄőåőŽç¿ľãĆŠèąÑãĄĎãĄ¿ãĄŹãĂĆïijĹæIJñæľ§èČ¡ãĄŕãĂĄä¡£çŤĺãĄŮãĄęãĄĎãĄ¿ãĄŻãĆ

Table 10: èÍ■åőŽéăĚçŻőäÿĂèęğ

èÍ■åőŽåĂď	åĘĚåőź	åĹİæIJ§åĂď
classname	æĎ§æČĚåĹď’åőŽãĆŠèąÑãĄĘåĞęçŘĘãĆŕãČľãĆźãĂĆ	(ãĄłãĄŲ)
scores	æĎ§æČĚãĆŠæŢřåĂď’åŇŰãĄŹãĆŃåĞęçŘĘãĆŕãČľãĆźãĂĆ	(ãĄłãĄŲ)

CHAPTER 26

Brain ãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČş

brainãĄőãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşãĄğãĄŕãĂĄbrainãĄŇèąŇãĄĘåŕ¿èľśåĞęçŘĘãĄńéŰćãĄŹãĆŃèĺ■åőŽãĆĎãĂĄåŘĽ

æľ§èČ¡åĹěãĄńåőŽç¿ľãĆŠèąŇãĄĘçĆžãĄńãĂĄæňąãĄőãĆţãČŰãĆżãĆŕãĆůãČğãČşãĄğægğŃæĹŘãĄŮãĄ¿ãĄŹãĂĆ

- *overrides* ïijŽ æľ§èČ¡æŃąåijţãĄńéŰćãĄŹãĆŃéăĚçŻőãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ
- *defaults* ïijŽ åŘŰå¿Ůåď śæŢŮæŹĆç■L'ãĄődefaultæŰĞå■ŮåĹŮãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ
- *binaries* ïijŽ ãĆůãČŁãČłãĆłãĄőãČŘãĆd'ãČŁãČłãČĞãČijãĆ£åĹl'çŤĺãĄńéŰćãĄŹãĆŃéăĚçŻőãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ
- *braintree* ïijŽ ãĆůãČŁãČłãĆłãĄőãČĂãČşãČŮåĞžåŁŻãĄńéŰćãĄŹãĆŃéăĚçŻőãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ
- *services* ïijŽ SubAgentéĂčæŘžæľ§èČ¡ãĄńéŰćãĄŹãĆŃéăĚçŻőãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ
- *nlu* ïijŽ NLUéĂŽä£ąãĄńéŰćãĄŹãĆŃéăĚçŻőãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ
- *security* ïijŽ åĹl'çŤĺåĹűéŹŘãĄńéŰćãĄŹãĆŃéăĚçŻőãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ
- *oob* ïijŽ OOB(Out of Band)åĞęçŘĘãĄńéŰćãĄŹãĆŃéăĚçŻőãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ
- *dynamic* ïijŽ åŃŢçŽĎãČĞãČijãĆ£åĞęçŘĘãĄńéŰćãĄŹãĆŃéăĚçŻőãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ
- *tokenizer* ïijŽ å■Ÿèłđå Ĺ Ęèğčã ĆĎæŰĞå■ŮåĹŮçţŘåŘĹãĄńéŰćãĄŹãĆŃéăĚçŻőãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ
- *debugfiles* ïijŽ çŢřåÿÿæČĚåăśãĄőåĞžåŁŻãĄńéŰćãĄŹãĆŃéăĚçŻőãĆŠåőŽç¿ľãĄŮãĄ¿ãĄŹãĂĆ

ãĆşãČşãČŢãĆčãĆřãČňãČijãĆůãČğãČşãĄőèÍŸè£řæŰźæşŢãĄŕãĂĄyamlãČŢãĆl'ãČijãČđãĆČãČĹãĆŠä¿ŃãĄńèłňæŸÕãĄŮãĄ¿ãĄŹ
jsonãĄŁãĆĹãĄşxmlãĄğãĆĆèÍŸèijL'æŰźæşŢãĄŇçŢřãĄłãĆŃãĄăãĄŠãĄğåŘ■çğřãĄŕåŘŃãĄŸãĄĺãĄłãĆŃãĄ§ãĆĄãĂĄjsonãĄŁãĆ

èĺ■åőŽä¿Ń

```
brain:

   overrides:
     allow_system_aiml: true

   defaults:
     default-get: unknown
     default-property: unknown
     default-map: unknown
```

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```
  binaries:
    save_binary: true
    load_binary: true
    load_aiml_on_binary_fail: true

  braintree:
    create: true

  services:
    REST:
        classname: programy.services.rest.GenericRESTService
        method: GET
        host: 0.0.0.0
    __PublishedREST__:
        classname: programy.services.publishedrest.PublishedRestService
    __PublishedBot__:
        classname: programy.services.publishedbot.PublishedBotService

  nlu:
      classname: programy.services.rest.GenericRESTService
      url: http://localhost:3000/run
      apikey: test_key
      use_file: false
      max_utterance_length: 300

  security:
      authorisation:
        classname: programy.security.authorise.usergroupsauthorisor.
↪BasicUserGroupAuthorisationService
        denied_srai: AUTHORISATION_FAILED
        denied_text: parmission error

  oob:
    default:
      classname: programy.oob.defaults.default.DefaultOutOfBandProcessor
    alarm:
      classname: programy.oob.defaults.alarm.AlarmOutOfBandProcessor
    camera:
      classname: programy.oob.defaults.camera.CameraOutOfBandProcessor
    clear:
      classname: programy.oob.defaults.clear.ClearOutOfBandProcessor
    dial:
      classname: programy.oob.defaults.dial.DialOutOfBandProcessor
    dialog:
      classname: programy.oob.defaults.dialog.DialogOutOfBandProcessor
    email:
      classname: programy.oob.defaults.email.EmailOutOfBandProcessor
    geomap:
      classname: programy.oob.defaults.map.MapOutOfBandProcessor
    schedule:
      classname: programy.oob.defaults.schedule.ScheduleOutOfBandProcessor
    search:
      classname: programy.oob.defaults.search.SearchOutOfBandProcessor
    sms:
      classname: programy.oob.defaults.sms.SMSOutOfBandProcessor
    url:
      classname: programy.oob.defaults.url.URLOutOfBandProcessor
    wifi:
      classname: programy.oob.defaults.wifi.WifiOutOfBandProcessor

  dynamic:
```

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```
      sets:
          numeric: programy.dynamic.sets.numeric.IsNumeric
          roman:   programy.dynamic.sets.roman.IsRomanNumeral
      maps:
          romantodec: programy.dynamic.maps.roman.MapRomanToDecimal
          dectoroman: programy.dynamic.maps.roman.MapDecimalToRoman
      variables:
          gettime: programy.dynamic.variables.datetime.GetTime

  tokenizer:
    classname: programy.dialog.tokenizer.tokenizer_jp.TokenizerJP
    punctuation_chars: ;'",!()[]ïijŽâĂŹâĂÎïijżãĂĄãĂĆïijĄïijĹïijL’ãĂÑãĂ■
    before_concatenation_rule: '.*[ -~]'
    after_concatenation_rule: '[ -~].*'

  debugfiles:
    save-errors: true
    save-duplicates: true
    save-errors_collection: true
```

26.1 overrides

æl’§èČ¡æŕŐãĄőåĞęçŘĘåĹűéŹŘç■L’ãĆŠåĹűå¿ąãĄŹãĆŃåőŽç¿l’ãĆŠèąÑãĄĎãĄ¿ãĄŹãĂĆ

Table 1: èĺ■åőŽéăĚçŻőäÿĂèęğ

èĺ■åőŽåĂď	åĘĚåőź	åĹİæIJ§åĂď
allow_system_aiml	templateãĄő *system* èęĄçt’ãĂąğãĄőãĆůãĆźãČĘãČăĂĆşãČđãČąåšČL’ïijĹOSä¿İå■ŸïijL’ãA

26.2 defaults

åŔŰå¿ŮåĞęçŘĘãĆŠèąÑãĄĘèęĄçt’ăãĄğãĄőåŔŰå¿Ůåd’śæŢŮæŹĆãĄőèĺ■åőŽæŰĞå■ŮåĹŮãĆŠåőŽç¿l’ãĄŮãA¿ãĄŹãĂĆ

Table 2: èĺ■åőŽéăĚçŻőäÿĂèęğ

èĺ■åőŽåĂď	åĘĚåőź	åĹİæIJ§åĂď
default-get	æIJłåőŽç¿l’åd’L’æŢřãĄńår¿ãĄŮãĂĄ *get* èęĄçt’ăç■L’ãĄğãČĞãČijãĆ£åŔŰå¿ŮãĆŠèąÑãĄłãĄčãĄ§åăt’åŘĹãĄńèĺ■åőŽãĄŢãĆÑãĆN *default-get* ãĄÑãĂĄæIJňèĺ■åőŽãĆĹãĆŁãĆĆåĎłåĚĹãĄŮãĄęä¡£çŤĺãĄŢãĆÑãA¿ãĄŹãĂĆ	unknown
default-property	*bot* èęĄçt’ăãĄğæIJłåőŽç¿l’ãĄőåd’L’æŢřåŘ■ãĆŠæÑĞåőŽãĄŮãĂĄ§åăt’åŘĹãĄńèĺ■åőŽãĄŢ *default-property* ãĄÑãĂĄæIJňèĺ■åőŽãĆĹãĆŁãĆĆåĎłåĚĹãĄŮãĄęä¡£çŤĺãĄŢãĆÑãA¿ãĄ	
default-map	*map* èęĄçt’ăãĄğåd’L’æŔŽår¿èśąãĄőæŰĞå■ŮåĹŮãĄÑãĄłãĄčãĄ§åăt’åŘĹãĄńèĺ■åő *default-map* ãĄÑãĂĄæIJňèĺ■åőŽãĆĹãĆŁãĆĆåĎłåĚĹãĄŮãĄęä¡£çŤĺãĄŢãĆÑãA¿ãĄŹãĄ	

`default-get` ãĄőèĺ■åőŽåĂď’ãĄŕãĂĄ*json* ãĆĎãĂĄRDFãĄőæď’IJçt’ć *select* ç■L’ãĄőèęĄçt’ăãĄğãĄőåŔŰå¿Ůåď’śæŢŮæŹĆãĄńèĺ■åőŽãĄŢãĆÑãĆÑãĄĺãĄĺãĆĆãĄńãĂĄ`default-property` ãĂĄ `default-map` ãĄÑæIJłåőŽç¿l’ãĄőåăt’åŘĹãĄőåĂď’ãĄĺãĄŮãĄęãĆĆä¡£çŤĺãĄŢãĆÑãA¿ãĄŹãĂĆ

26.3 binaries

ãĆůãČŁãČłãĆłãĆŠåśŢéŰÑãĄŮãĄ§ãČŘãĆď’ãČŁãČłãČĞãČijãĆ£ãĄőåĹ’çŤĺãĄńéŰćãĄŹãĆÑåőŽç¿l’ãĆŠèąÑãĄĎãA¿ãĄŹãĂĆ

Table 3: èÍ■åőŽéăĚçŻőäÿĂèęğ

èÍ■åőŽåĂď	åĘĚåőź	åĹÍæIJ§åĂď
load_binary	Botètţůå ŇŢæŹĆãĄőãČŘãĆď ãČŁãČłãČĞãČijãĆ£èł■ãĄ£è¿ijãĄ£åď śæŢŮæŹĆãĄőãőŞæŰ¡ãĂĆ	
save_binary	ãĆůãČŁãČłãĆłåśŢéŰŃæŹĆãĄőãČŘãĆď ãČŁãČłãČĞãČijãĆ£èł■ãĄ£è¿ijãĄ£åď śæŢŮæŹĆãĄőãőŞæŰ¡ãĂĆ	
load_aiml_on_binary_fail	ãČŘãĆď ãČŁãČłãČĞãČijãĆ£èł■ãĄ£è¿ijãĄ£åď śæŢŮæŹĆãĄőãőŞæŰ¡ãĂĆ	

26.4 braintree

ãĆůãČŁãČłãĆłãĄőåśŢéŰŃçţŘæđIJãĄőãČĂãČşãČŮåĞžåŁŻãĄńéŰćãĄŹãĆŃåőŽç¿l'ãĆŠèąŇãĄĎãĄ¿ãĄŹãĂĆ

Table 4: èÍ■åőŽéăĚçŻőäÿĂèęğ

èÍ■åőŽåĂď	åĘĚåőź	åĹÍæIJ§åĂď
create	ãĆůãČŁãČłãĆłãĄőåśŢéŰŃçţŘæđIJãĄőãČŢãĆąãĆď ãČńçŢ§æłIJãĆŠåő§æŰ¡ãĂĆ	

26.5 services

åď ŰéČĺãĆţãČijãČŞãĆźãĄĺéĂčæŘžãĄŹãĆŃçĆžãĄńãĂĄSubAgentéĂčæŘžæl'§èČ¡ãĄğä¡£çŢĺãĄŹãĆŃåĞęçŘĘãĆŕãČl'ãĆźãĆĎãĂ

äžëäÿŃãĄŕãĂĄãĆţãČijãČŞãĆźåŘ■æŕŐãĄńèÍ■åőŽåŔŕèČ¡ãĄłéĂĚçŻőãĄğãĄŹãĄĄŇãĂĄä¡£çŢĺãĄŢãĆŃãĆŃéĂĚçŻőãĄŕåĞęçŘĘãĆŕã
ãĆţãČijãČŞãĆźæŕŐãĄőåĞęçŘĘãĆŕãČl'ãĆźãĄőä¡IJæĹŘãĄńãĄd'ãĄĎãĄęãĄŕãĂĄ*ãĆńãĆźãĆ£ãČåđď ŰéČĺãĆţãČijãČŞãĆźåő§èčĚ*
ãĆŠåŔĆçĚğãĄŮãĄęãĄŘãĄăãĄŢãĄĎãĂĆ

Table 5: èÍ■åőŽéăĚçŻőäÿĂèęğ

èÍ■åőŽåĂď	åĘĚåőź	åĹÍæIJ§åĂď
classname	åď ŰéČĺãĆţãČijãČŞãĆźãĄĺéĂŽä£ąãĄŹãĆŃåĞęçŘĘãĆŕãČl'ãĆźãĄĞĄŮ)	
url	åď ŰéČĺãĆţãČijãČŞãĆźãĄőæŐěçűŽURLãĂĆ	(ãĄłãĄŮ)
host	åď ŰéČĺãĆţãČijãČŞãĆźãĆŠæŔŘä¿ŽãĄŹãĆŃãĆţãČijãČŘãĄőãĄłãĄŮ)ĂĄąãĄ¿ãĄ§ãĄŕã	
port	åď ŰéČĺãĆţãČijãČŞãĆźãĆŠæŔŘä¿ŽãĄŹãĆŃãĆţãČijãČŘãĄőãĄłãĄŮ)ůãĂĆ	
method	HTTPéĂŽä£ąãĄőmethodåŘ■ãĂĆ	(ãĄłãĄŮ)
denied_srai	éĂŽä£ąãĄńåď śæŢŮãĄŮãĄ§åăt'åŔĹãĄńåő§èąŇãĄŹãĆŃçŹźãĄĞĄŮ)ãĆãĆůãČŁãČłã	

èÍ■åőŽä¿ŃãĄńãĄĆãĆŃæňąãĄőãĆţãČijãČŞãĆźåőŽç¿l'ãĄŕãĂĄSubAgentæl'§èČ¡ãĆŠæŔŘä¿ŽãĄŹãĆŃãĄ§ãĆĄãĄőåőŽç¿l'ãĄğãĄ

- __PublishedREST__ ïijŽ *æśŐçŤĺRESTéĂŽä£ą* ãĆŠèąŇãĄĘåĞęçŘĘãĆŕãČl'ãĆźãĄğãĄŹãĂĆ
- __PublishedBot__ ïijŽ *åĚňéŰŃBotéĂčæŘž* ãĆŠèąŇãĄĘåĞęçŘĘãĆŕãČl'ãĆźãĄğãĄŹãĂĆ

26.6 nlu

ãČđãČČãČĄåĞęçŘĘãĄńä¡£çŢĺãĄŹãĆŃNLUãĆţãČijãČŘãĄńéŰćãĄŹãĆŃåőŽç¿l'ãĆŠèąŇãĄĎãĄ¿ãĄŹãĂĆ

NLUãĆţãČijãČŘãĄőæŐěçűŽåĚĹæČĚåăśãĄĺãĄŮãĄęæIJL'åŁźãĄłåőŽç¿l'ãĄŃãĄłãĄĎåăt'åŔĹãĄńãĄŕãĂĄNLUãĆŠåĹl'çŢĺãĄŮãĄ
NLUãĄńéŰćãĄŹãĆŃèl'şçt'ŕãĄŕãĂĄ*NLU* ãĆŠåŔĆçĚğãĄŮãĄęãĄŘãĄăãĄŢãĄĎãĂĆ

Table 6: èÍ■åőŽéăĚçŻőäÿĂèęğ

èÍ■åőŽåĂď	åĘĚåőź	åĹÍæIJ§åĂď
classname	NLUãĆţãČijãČŘãĄĺéĂŽä£ąãĄŹãĆŃåĞęçŘĘãĆŕãČl'ãĆźãĂĆ	programy.nlu.nlu.NluRequ
url	NLUãĆţãČijãČŘãĄőæŐěçűŽURLãĂĆ	http://localhost:3000/run
apikey	NLUãĆţãČijãČŘãĄĺãĄőéĂŽä£ąæŹĆãĄńäżŸåŁããĄŹãĆŃapi-çl'žæŰĞå■Ů) keyãĂĆHTTPãČŸãČČãČĂïijŽâĂŹx-api-keyâĂŹãĄğéĂĄä£ąãĄŮãĄ¿ãĄŹãĂĆ	
timeout	NLUãĆţãČijãČŘæŕŐãĄőéĂŽä£ąæŹĆéŰŞãĄőæIJĂåď'ğåĂď'ïijŰçğŠå■Ÿä¡■ïijL'ãĆŠåĚśé
use_file	NLUãĆţãČijãČŘãĄőæŐěçűŽåőŽç¿l'ãĄń *nlu_serversãČŢãĆąãĆď'ãČń* ãĆŠåĹl'çŤĺãĄŹãĆŃæŇĞåőŽãĂĆ	false
max_utterance_length	NLUãĆţãČijãČŘãĄńéĂĄä£ąãĄŹãĆŃçŹžèl'śæŰĞãĄőæIJĂåď'ğéŢůãĂĆåĹűéŹŘéŢůãĆŠ 1(åĹűéŹŘãĄłãĄŮ)	

`classname` ãĄńãĄŕãĂĄâĂŹprogramy.nlu.cotobadesignNlu.CotobadesignNluâĂŹ
ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
æIJňåĞęçŘĘãĆŕãČl'ãĆźãĄŕãĂĄsraixèęAçt'ăãĄğçŻt'æŐěNLUãĄŃãĆL'ãĄőçţŘæđIJãĆŠåŘŰå¿ŮãĄŹãĆŃ
NLUéĂŽä£ą åĞęçŘĘãĄğãĆĆåĹl'çŤĺãĄŮãĄ¿ãĄŹãĂĆ

åřŽãĂĄèd'ĞæŢřãĄőNLUãĆţãČijãČŘãĆŠåĹl'çŤĺãĄŹãĆŃåăt'åŘĹãĄńãĄŕãĂĄ`use_file: true`
ãĆŠæŇĞåőŽãĄŮãĄęãĂĄnlu_serversãČŢãĆąãĆď'ãČńãĄğåőŽç¿l'ãĆŠèąÑãĄčãĄęãĄŘãĄăãĄŢãĄĐãĂĆ

26.7 security

ãČęãČijãĆűæŕŐãĄğãĄőãĆůãČŁãČłãĆłãĄőåĹl'çŤĺåĹűéŹŘçL'ãĄőåőŽç¿l'ãĆŠèąÑãĄĐãĄ¿ãĄŹãĂĆ
securityãĄőåĹűå¿ąãĄńãĄŕãĂĄæňąãĄőïijŞãĄd'ãĄőçĺőéąđãĄÑãĄĆãĆŁãĄ¿ãĄŹãĂĆ

- authentication'ïijŽ brainåĞęçŘĘãĄğãĄőåĹl'çŤĺåĹűéŹŘãĆŠèąÑãĄĐãĄ¿ãĄŹãĂĆïijĹä¡£çŤĺãĄŮãĄęãĄĐãĄ¿ãĄŹãĆŞãĂĆïijL
- account_linker'ïijŽ åd'ŰéČĺãĆţãČijãČŞãĆźãĆŠéĂčæŘžãĄŮãĄęåĹl'çŤĺåĹűéŹŘãĆŠèąÑãĄĐãĄ¿ãĄŹãĂĆïijĹä¡£çŤĺãĄŮãĄęã
- authorisation'ïijŽ templateãĄő *authorize* èęAçt'ăãĄğåĹl'çŤĺãĆŠåĹűéŹŘãĄŮãĄ¿ãĄŹãĂĆ

å¿ŞãĄčãĄęãĂĄ`authorisation` ãĄőãĄ£ãĄőåőŽç¿l'ãĄÑæIJL'åŁźãĄğãĄŹãĂĆèl'şçt'řãĄńãĄd'ãĄĐãĄęãĄŕãĂĄ*Security*
ãĆŠåŔĆçĚğãĄŮãĄęãĄŘãĄăãĄŢãĄĐãĂĆ

Table 7: èÍ■åőŽéăĚçŻőäÿĂèęğ

èÍ■åőŽåĂď	åĘĚåőź	åĹÍæIJ§åĂď
classname	åĹl'çŤĺåĹűéŹŘåĹűå¿ąãĆŠèąÑãĄĘåĞęçŘĘãĆŕãČl'ãĆźãĂĆ	(ãĄłãĄŮ)
denied_srai	èl■èĺijãĄńåd'śæŢŮãĄŮãĄ§åăt'åŘĹãĄńåő§èąÑãĄŹãĆŃçŹžèl'śæŰĞãĄ
denied_txt	èl■èĺijãĄńåd'śæŢŮãĄŮãĄ§åăt'åŘĹãĄńè£ŤãĄŹæŰĞå■ŮåĹŮãĄŹãĄ	(ãĄłãĄŮ)

`denied_srai` ãĄĺ `denied_txt` ãĄőäÿąæŰźãĄÑæŇĞåőŽãĄŢãĆŇãĄęãĄĐãĆŃåăt'åŘĹãĂĄ de-
nied_sraiãĄőçţŘæđIJãĄÑçl'žæŰĞå■ŮãĄőåăt'åŘĹãĄńãĂĄdenied_txtãĄőæŰĞå■ŮåĹŮãĄÑä¡£çŤĺãĄŢãĆŇãĄ¿ãĄŹãĂĆ

26.8 oob

OOBãĄőèl■åőŽ ãĆŠåŔĆçĔğãĄŮãĄęãĄŔãĄăãĄŢãĄĎãĂĆ

26.9 dynamic

ãČĞãČijãĆ£ãĄőåŔŰå¿ŮãČżåďĽæŔŻãĆŠåĂďãĆŠåőŽç¿ľãĄŹãĆŃå¡ćåijŔãĄğãĄŕãĄłãĄŔãĂĄåĞęçŘĘãĆŕãČľãĆźãĆŠåĹľçŤÍãĄ
dynamicãĄŇåĹľçŤÍãĄğãĄ■ãĆŃéăĚçŻőãĄńãĄŕãĂĄæňąãĄőïijŞãĄďãĄőçÍőéąđãĄŇãĄĆãĆŁãĄ¿ãĄŹãĂĆ

- setsïijŽ patternãĄő *set* èęĄçťăãĄńåŕ¿ãĄŹãĆŃãČđãČČãČĄåĞęçŘĘãĆŠæŇĞåőŽãĄŢãĆŇãĄ§åĞęçŘĘãĆŕãČľãĆźãĄğåő§æŰ
- mapsïijŽ templateãĄő *map* èęĄçťăãĄńåŕ¿ãĄŹãĆŃåďĽæŔŻåĞęçŘĘãĆŠæŇĞåőŽãĄŢãĆŇãĄ§åĞęçŘĘãĆŕãČľãĆźãĄğåő§æ
- variables: ãĆřãČ■ãČijãČŘãČńåďĽæŢřïijĹnameïijĽãĄő *get* ãĄńåŕ¿ãĄŮãĄęåĞęçŘĘãĆŕãČľãĆźãĄőçţŘæđIJãĆŠè£ŤãĄŮãĄ¿

ãĄİãĆŇãĄđãĆŇãĄğãĂĄæňąãĄőåőŽç¿ľãĆŠèąŇãĄĎãĄ¿ãĄŹãĂĆ

Table 8: èÍ■åőŽéăĚçŻőäÿĂèęğ

èÍ■åőŽåĂď	åĘĚåőź	åĹİæIJ§åĂď
ãĆÍãČşãČĹãČłåŘ■	ãĆÍãČşãČĹãČłåŘ■ãĄńèľšå¡ŞãĄŹãĆŃèęĄçťăãĄőåĞęçŘĘãĆŕãČľãĆźãĂĆ	(ãĄłãĄŮ)

èÍ■åőŽä¿ŃãĄńãĄĆãĆŃåŘĎåĞęçŘĘãĆŕãČľãĆźãĄğãĄŕãĂĄäżěäÿŃãĄőåĞęçŘĘãĆŠèąŇãĄĎãĄ¿ãĄŹãĂĆ

Table 9: èÍ■åőŽéăĚçŻőäÿĂèęğ

çĺőéąđ	ãĆÍãČşãČĹãČłåŘ■	åĞęçŘĘãĆŕãČľãĆź	åĞęçŘĘåĘĚåőź
sets	numeric	programy.dynamic.sets.numeric.IsNumeric	èęĄçťăãĄőãČđãČČãČĄåĞęçŘĘãĄğèľšå¡ŞæŰĞå■ŮåĹŮãĄŇæŢ
	roman	programy.dynamic.sets.roman.IsRomanNumeral	âĂİãĄőãČđãČČãČĄåĞęçŘĘãĄğèľšå¡ŞæŰĞå■ŮåĹŮãĄŇèŃśæŢ
maps	romantodec	programy.dynamic.maps.roman.MapRomanToDecimal	âĂİãĄőåĞęçŘĘãĄÍãĄŮãĄęãĂĄãĆćãČľãČŞãĆćæŢřå■ŮèąÍèÍŸã
	dectoroman	programy.dynamic.maps.roman.MapDecimalToRoman	ãĄőåĞęçŘĘãĄÍãĄŮãĄęãĂĄãČ■ãČijãČđæŢřå■ŮèąÍèÍŸãĆŠãĆć
variables	gettime	programy.dynamic.variables.datetime.GetTime	nameåďĽæŢřãĄőgetãĄńåŕ¿ãĄŮãĄęãĂĄçŔ¿åIJĺæŮĕæŹĆãĄőæČĚå

åřŽãĂĄãĄŞãĆŇãĆĽãĄőåőŽç¿ľãĄŇæIJĽåŁźãĄłåăť åŘĹãĂĄåŘĎèęĄçťăãĄőåĞęçŘĘãĄÍãĄŮãĄęåĎłåĚĹãĄŢãĆŇãĆŇãĄ§ãĆĄã
âĂŸmapsâĂŹ, âĂŸdefaultsâĂŹ ãĄğãĄőåŘŇäÿĂåŘ■çğřãĄőæŇĞåőŽãĄŕçĎąåŁźãĄńãĄłãĆŁãĄ¿ãĄŹãĂĆ

26.10 tokenizer

çŹžèľśæŰĞãĄőå■ŸèłđåĹĘèğčãĆĎãĂĄå£IJç■ŤæŰĞçŤ§æĹŘæŹĆãĄńèąŇãĄĘæŰĞå■ŮåĹŮçţŘåŘĹïijĹtemplateãĄőèęĄçťăå■Ÿä

Table 10: èÍ■åőŽéăĚçŻőäÿĂèęğ

èÍ■åőŽåĂď	åĘĚåőź	åĹİæIJ§åĂď
classname	åĹľçŤÍãĄŹãĆŃTokenizerãĄőåĞęçŘĘãĆŕãČľãĆźãĂĆ	programy.dialog.tokenizer.
punctuation_chars	åŇžåĹĞãĆŁæŰĞå■ŮæĽśãĄĎãĆŠèąŇãĄĘæŰĞå■ŮãĆŠæŇĞåőŽ(âĂŸâĂŹ)ãĂŹãĂĆåŇž *punctuation_chars* ãĄŇãĂĄæIJňèÍ■åőŽãĆĹãĆŁãĆĆåĎłåĚĹãĄŮãĄęä¡£çŤÍãĄŢãĆŇãĄ¿	
before_concatenation_rule	å£IJç■ŤæŰĞçŤ§æĹŘç■ĽãĄğãĂĄçŤ§æĹŘãĄŢãĆŇãĄ§èďĞæŢřãĄőæŰĞå■ŮåĹŮãĆŠé *before_concatenation_rule* ãĄŇãĂĄæIJňèÍ■åőŽãĆĹãĆŁãĆĆåĎłåĚĹãĄŮãĄęä¡£çŤÍãĄŢãĆŇãĄ¿ãĄŹãĂĆ	
after_concatenation_rule	å£IJç■ŤæŰĞçŤ§æĹŘç■ĽãĄğãĂĄçŤ§æĹŘãĄŢãĆŇãĄ§èďĞæŢřãĄőæŰĞå■ŮåĹŮãĆŠé *after_concatenation_rule* ãĄŇãĂĄæIJňèÍ■åőŽãĆĹãĆŁãĆĆåĎłåĚĹãĄŮãĄęä¡£çŤÍãĄŢã	

æŮěæIJňèłđãĄğãĄőåŕ¿èľśãĆŠèąŇãĄĘåăť åŘĹãĄńãĄŕãĂĄclassname
ãĄńãĂĄâĂŹprogramy.dialog.tokenizer.tokenizer_jp.TokenizerJPâĂŹ ãĆŠæŇĞåőŽãĄŮãĄ¿ãĄŹãĂĆ
before_concatenation_rule,after_concatenation_rule
ãĄŕãĂĄæŮěæIJňèłđçŤĺãĄőèĺ■åőŽéäĚçŻőãĄğãĄŹãĂĆ

26.11 debugfiles

ãĆůãČŁãČłãĆłãĆĎèĺ■åőŽãČŢãĆąãĆd'ãČńãĄőåśŢéŰŃãĄńãĄŁãĄŚãĆŃçŢřåÿÿæČĚåăśãĄőåĞžåŁŻãĄńéŰćãĄŹãĆŃåőŽç¿l'ãĆŠè

Table 11: èĺ■åőŽéäĚçŻőäÿĂèęğ

èĺ■åőŽåĂď	åĘĚåőź	åĹİæIJ§åĂď
save-errors	ãĆůãČŁãČłãĆłåśŢéŰŃæŹĆãĄőçŢřåÿÿèÍŸè£řãĆĎãĂĄæŢť'åŘĹæĂğãĄőäÿ■æ■čãĄńéŰ *errosãĆĺãČşãČĘãĆčãČĘãĆč* ãĄńåŕ¿ãĄŹãĆŃåĞžåŁŻåĞęçŘĘãĄŇèąŇãĆŔãĆŇãĄ¿ãĄŹãĂĆ	
save-duplicates	ãĆůãČŁãČłãĆłåśŢéŰŃæŹĆãĄőåőŽç¿l'éĞ■èd'ĞæČĚåăśãĄőåĞžåŁŻæŇĞåőŽãĂĆâĂŹtr *duplicatesãĆĺãČşãČĘãĆčãČĘãĆč* ãĄńåŕ¿ãĄŹãĆŃåĞžåŁŻåĞęçŘĘãĄŇèąŇãĆŔãĆŇãĄ¿ãĄŹãĂĆ	
save-errors_collection	åŘĎçĺőèĺ■åőŽãČŢãĆąãĆd'ãČńãĄőçŢřåÿÿãĄńéŰćãĄŹãĆŃæČĚåăśãĄőåĞžåŁŻæŇĞåőŽ *erros_collectionãĆĺãČşãČĘãĆčãČĘãĆč* ãĄńåŕ¿ãĄŹãĆŃåĞžåŁŻåĞęçŘĘãĄŇèąŇãĆŔãĆŇãĄ¿ãĄŹãĂĆãĂĆ	

CHAPTER 27

OOBãĄőèÍ■åőŽ

OOB(Out of Band)åĞçŘĘãĄńãĄŕãĂĄä¡£çŤÍãĄŹãĆŃOOBãĄőæľ§èČ¡æŕŐãĄńPythonãĆŕãČľãĆźãĄŇå£ĚèçĄãĄğãĄŹãĂĆ ãĄŞãĄőãĆŕãČľãĆźãĄŕAIMLãĄőoobèçĄçťäãĄğåijŢãĄ■æÿąãĄŢãĆŇãĄ§æŰĞå■ŮåĹŮãĆŠåijŢæŢřãĄÍãĄŮãĄęåĞçŘĘãĄŮãĂĄ

äżĕäÿŃãĄŕãĂĄåŕ¿èľśãĆÍãČşãĆÿãČşãĄŇä£ÍæŇĄãĄŹãĆŃåő§èčĚãĆŕãČľãĆźãĄőä¿ŃãĄğãĄŹãĂĆåő§èąŇéŰćæŢřåĘĚãĄŕåijŢæŢř åő§éŽŻãĄńåĹľçŤÍãĄŹãĆŃåäťåŘĹãĄŕãĂĄåĂŃãĂĔãĄőãĆůãĆźãČĘãČäãĄńå£IJãĄŸãĄ§åő§èčĔãĄŇå£ĚèçĄãĄğãĄŹãĂĆ

```
oob:
  default:
    classname: programy.oob.defaults.default.DefaultOutOfBandProcessor
  alarm:
    classname: programy.oob.defaults.alarm.AlarmOutOfBandProcessor
  camera:
    classname: programy.oob.defaults.camera.CameraOutOfBandProcessor
  clear:
    classname: programy.oob.defaults.clear.ClearOutOfBandProcessor
  dial:
    classname: programy.oob.defaults.dial.DialOutOfBandProcessor
  dialog:
    classname: programy.oob.defaults.dialog.DialogOutOfBandProcessor
  email:
    classname: programy.oob.defaults.email.EmailOutOfBandProcessor
  geomap:
    classname: programy.oob.defaults.map.MapOutOfBandProcessor
  schedule:
    classname: programy.oob.defaults.schedule.ScheduleOutOfBandProcessor
  search:
    classname: programy.oob.defaults.search.SearchOutOfBandProcessor
  sms:
    classname: programy.oob.defaults.sms.SMSOutOfBandProcessor
  url:
    classname: programy.oob.defaults.url.URLOutOfBandProcessor
  wifi:
    classname: programy.oob.defaults.wifi.WifiOutOfBandProcessor
```

ãČŚãČľãČąãăĕÿÖČ£		ä¿Ń	ãČĞãČŢãĆľãČńãČĹ
classname	OOBåő§èčĚãĄőãČŢãĆŕãČĆ	programy.oob.defaults.alarm.AlarmOutOfBandProcessor	None

OOBãĄőåĞçŘĘæŰźæşŢãĄŕãĂĄ*OOB* ãĆŠåŔĆçĔğãĄŮãĄęãĄŔãĄăãĄŢãĄĎãĂĆ