

Prototyping the Conversion from a Directed Dialog Speech User Interface to a Natural Commands User Interface

TR 29.3636
April 14, 2003

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Abstract

This report teaches methods for extending a directed dialog prototype developed using VoiceXML to a prototype with a natural commands user interface (an interface that mimics natural language understanding with a complex finite-state grammar, but does not use NLU technologies based on statistical language models). It does not necessarily teach professional coding practices, but does teach in a step-by-step fashion critical prototyping skills that we have found useful for evaluating speech user interface concepts and in conducting early usability studies.

ITIRC Keywords

VXML
VoiceXML
Rapid prototyping
Speech user interfaces
Directed dialog user interface
Natural commands user interface
Best practices
IBM VoiceXML Toolkit
IBM Speech Browser SDK

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Introduction

The primary purpose of VoiceXML is to enable the creation of a verbal (rather than a visual) interface to data. The design of VoiceXML makes it ideal for coding call flows (system prompts and help messages, speech recognition grammars, and directing the call flow based on user speech). The VoiceXML Forum (IBM¹, AT&T², Lucent³, Motorola⁴, and other companies) is the organization that, working with the W3C, has standardized VoiceXML (VoiceXML Forum, 2000).

In a previous report (Lewis, 2002), I illustrated ways to create programs that are consistent with current best practices in the design of directed dialog speech user interfaces (for best-design guidance, see Balentine, Morgan, & Meisel, 2001; Gardner-Bonneau, 1999; IBM, 2001; Lewis, Simone, & Bogacz, 2000; Polkosky & Lewis, 2002; Sadowski & Lewis, 2000a, 2000b, 2001; Virzi & Huitema, 1997).

The last program example in the previous report was a directed dialog application called Hello Worlds Version 4. A key characteristic of a directed dialog user interface is that users respond to very directive prompts when working with the application, and typically provide only one piece of information per prompt. For example, the first prompt that a user hears in Hello Worlds Version 4 is, “Select a planet. Say Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, or Exit.” Note how this prompt tells the user exactly what to say. Because user responses to these types of prompts are very predictable, directed dialog applications do not require complex grammars.

A natural commands user interface, by contrast, allows users more flexibility in how they begin working with an application by using a complex grammar to interpret users’ initial utterances. Consequently, the initial prompt is much less directive, such as “Please say a mail command, or say Help” or “How may I help you?” Because the initial prompt is nondirective, it is important to provide special example helps that play after a relatively short 3-second silence timeout (or on nomatch or help events).

The purpose of this report is to describe the conversion of the prototype application Hello Worlds Version 4 (directed dialog user interface) into Hello Worlds Version 5 (natural commands user interface). I strongly recommend that readers of this report first get and read the previous report (Lewis, 2002). As in the previous report, the primary goal of the code described in this report is to produce a prototype that has the desired user interface behaviors required to experiment with this type of interface. The coding methods are not necessarily representative of the techniques that a professional programmer would use.

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Converting Hello Worlds from Directed Dialog to Natural Commands

Starting the Conversion

The starting point for the conversion is the existing Hello Worlds Version 4b prototype (See Appendix A), copied from Lewis (2002). The first step is to create a new file for the natural commands grammar. There are several grammar formats supported by VoiceXML. This report uses the JSGF grammar format. The prototype's natural command grammar (planetsnc.jsgf) appears in its uninterrupted entirety in Appendix B.

Figure 1. The First Lines of the Grammar

```
#JSGF V1.0;

grammar planetsnc;

public <planetsnc> = <planetsentence>
    | <topicsentence>
    | <planetandtopicsentence>
    | <yessentence>
    | <nosentence>
    ;
```

The first three lines (inserted by the toolkit automatically when creating the file) define the file type and name. The fifth line (public) defines the level of the grammar that is visible to the application -- the public node (which by default has the same name as the grammar file). The other lines define the sentence nodes in the grammar. The types of sentences the grammar will recognize are those that refer to planet names, planet topics (for example, planet size, planet temperature, distance from the sun, etc.), both a planet name and a planet topic, indicate a 'yes' response, and indicate a 'no' response.

The nodes (enclosed in <>) are grammar variables that reference other nodes. Nodes can reference other nodes to virtually any level. For example:

Figure 2. Nodes Referencing Other Nodes

```
<sentences> = <topicsentence> | <planetsentence> | <yesnosentence> | ...;
<topicsentence> = <topic> | <sentencestarters> [the] <topic> ;
<topic> = distance [from the sun] {distance} | orbital period {orbit} | ... ;
<sentencestarters> = I would like to know about | Tell me about | ... ;
```

In the figure above, <sentences> references <topicsentence> which references <topic> and <sentencestarters>.

Defining the Planets

The next two nodes (shown in Figure 3) define the values for planets (spoken as either a regular or possessive noun). Note the use of grammar tags {tagvalue} to equate these expressions (similar to their use in the directed dialog version of the prototype in certain embedded grammars).

Figure 3. Planet Definitions

```
<planet> = mercury {mercury}
          | venus {venus}
          | earth {earth}
          | mars {mars}
          | jupiter {jupiter}
          | saturn {saturn}
          | uranus {uranus}
          | neptune {neptune}
          | pluto {pluto}
          ;

<planets> = mercuries {mercury}
           | venuses {venus}
           | earths {earth}
           | mars {mars}
           | jupiters {jupiter}
           | saturns {saturn}
           | uranus {uranus}
           | neptunes {neptune}
           | plutoes {pluto}
           ;
```

Defining Topics

The next node defines the values for topics that the grammar will accept. Note that optional words (words that a user can say but is not required to say) are enclosed in square brackets.

Figure 4. Topic Definition

```
<topic> = distance [from the sun] {distance}
          | orbit | orbital period {orbit}
          | temperature {temperature}
          | size {size}
          | atmosphere | atmospheric composition {atmosphere}
          | [number of] moons {moons}
          ;
```

Defining Sentence Starters

The node <sentencestarters> contains a collection of different ways that natural commands might start. Note that this is a first draft only -- the complete development of this type of node is highly iterative.

Figure 5. Sentence Starters (Initial Draft)

```
<sentencestarters> = I would like to know about
| I want to know about
| [please] tell me about
| I would like information about
| I want information about
| [please] give me information about
| [please] tell me the information about
;
```

Requesting All Information about a Planet

The next nodes define various ways that a user might ask to hear all of the information available about a planet. Note that any sentence containing <planet> will return the specified planet's name. Anything with <everything> or <allofthe> will return 'all'.

Figure 6. Getting All of a Planet's Information

```
<sentencestartersall> = I would like to know <everything> about
| I want to know <everything> about
| [please] tell me <everything> about
| I would like <allofthe> information about
| I want <allofthe> information about
| [please] give me <allofthe> information about
| [please] tell me <allofthe> the information about
;

<everything> = everything {all}
| all {all}
;

<allofthe> = all {all}
| all the {all}
| all of the {all}
;

<planetsentence> = <planet>
| <sentencestarters> <planet>
| <sentencestartersall> <planet>
;
```

Topic and Planet/Topic Sentences

The next example shows the sentences that contain a topic node or both topic and planet nodes. Any sentence with <topic> will return a topic value (specifically, the tag value enclosed in '{ }'). A distance sentence will return both a planet and a topic value. The complete grammar includes sentences like this for all of the combinations of planets and topics. When a grammar returns two values, they appear in the order in which they were interpreted, separated by a space (for example, "mars distance").

Figure 7. Topic and Combined Planet/Topic Sentences

```
<topicsentence> = <topic>
                  | <sentencestarters> [the] <topic>
                  ;

<planetandtopicsentence> = <distancesentences>
                            | <orbitsentences>
                            | <temperaturesentences>
                            | <sizesentences>
                            | <atmospheresentences>
                            | <moonsentences>
                            | <generalsentences>
                            ;

<distancesentences> = how far is <planet> from the sun {distance}
                    | what is the distance of <planet> from the sun {distance}
                    | <planet> is how far from the sun {distance}
                    | what is <planets> distance from the sun {distance}
                    ;
```

Sentences with Implied Topics

Once you have a grammar that can handle sentences that have explicit representation of planet and topic tokens (for example, “What is the **distance** of **Mercury** from the sun?”), you can create a set of questions in which the topic is implied rather than explicit and the answer is the planet name enclosed in the grammar tag. These sentences are unique in that they are very different from the types of expressions that a directed dialog can handle, even with mixed initiative. The code for some of these sentences appears in Figure 8.

Figure 8. Some Two-Token Sentences with Implied Topics

```
<whatis> = [<what> is] the hottest planet {venus temperature}
          | <what> planet is the coldest {pluto temperature}
          | <what> planet is [the] closest [to the sun] {mercury distance}
          | [<what> is] the closest planet to earth {mars distance}
          | [<what> is] the <largest> planet {jupiter size}
          | <what> planet is the smallest {pluto size}
          ...
          | <what> planet has the most moons {jupiter moons};
```

Yes and No Sentences

Yes sentences will return a value of 'yes'; no sentences a value of 'no'. Note use of parentheses to define required alternates. These are in grammar to support yes/no responses to an 'Anything else?' prompt.

Figure 9. Yes/No Sentences

```
<yessentence> = yes {yes}
               | please {yes}
               | yes please {yes}
               ;

<nosentence> = no [thanks] {no}
               | no thank you {no}
               | nothing [thanks] {no}
               | nothing thank you {no}
               | nothing else [thank you] {no}
               | (not | nothing) now {no}
               | (not | nothing) at this time {no}
               | I doent (want | need) to know anything else [at this time] {no}
               ;
```

Changing the VoiceXML Code to Support Natural Commands

After creating the complex grammar, it is necessary to make a number of changes to the VoiceXML code to support the use of the new natural commands grammar. The following changes are consistent with current best practices. The application starts with a nondirective initial prompt (following a standard introduction), with the silence (noinput) timeout set to three seconds.

On a noinput, nomatch, or help event, the system plays a set example helps. The example helps address frequently used functions and promote the production of sentences that include more than one token (one of the major usability benefits derived from a natural commands grammar). There is a second set of example helps that follow the presentation of the first set of example helps after a standard noinput timeout of seven seconds, a nomatch, or a specific request for help. If the two sets of example helps have not prompted the user to provide a valid natural command, then the system falls back to its original directed dialog.

If the user has provided a valid natural command with topic and planet tokens (provided in either order), the application has everything it needs to provide the requested information. If the user provides only a planet, the system requests a topic. If the user provides only a topic, the system requests a planet.

Figure 10 shows the code that plays the initial nondirective prompt ('What would you like to know?').

Figure 10. The New Initial Nondirective Prompt for the VoiceXML File

```
<prompt timeout="3s">
  <break msec="150"/>
  <audio src="z-wwwyltk.au">
    What would you like to know?
  </audio>
</prompt>
```

The next figure shows the two sets of example helps. Note that each sample sentence includes both a topic and planet.

Figure 11. The Example Helps

```
<if cond="helpcounter == 1">
  <prompt timeout="7s">
    <audio src="z-mainhelpnc1.au">
      <break msec="150"/>For example, you could ask a question like How Far Is Pluto
      From The Sun, What Is The Orbital Period of Mercury, or How Hot Is Venus.
    </audio>
  </prompt>
</if>
<if cond="helpcounter == 2">
  <prompt timeout="7s">
    <audio src="z-mainhelpnc2.au">
      <break msec="150"/>Let's try again. You could say How Many Moons Does
      Jupiter Have, What Does Mars Have In Its Atmosphere, or Tell Me Everything
      About Saturn.
    </audio>
  </prompt>
</if>
```

As shown in the next code segment, if the two sets of example helps have not prompted the user to produce a valid command, the program branches to a directive prompt.

Figure 12. Falling Back to a Directed Dialog

```
<if cond="helpcounter == 3">
  <assign name="helpcounter" expr="0"/>
  <goto next="#mainmenu"/>
</if>
</catch>
```

For variety, the application includes a second version of the helloworlds form that has alternative nondirective prompts, as shown in the following figure.

Figure 13. Alternative Nondirective Prompts

```
<block name="secondprompt">
  <if cond="secondtime == 'no'">
    <goto nextitem="lastprompt"/>
  </if>
  <prompt timeout="3s">
    <audio src="z-wewyltk.au">
      <break msec="150"/>What else would you like to know? </audio> </prompt>
    <assign name="secondtime" expr="no"/>
    <goto nextitem="planetnc2"/> </block>
  <block name="lastprompt">
    <prompt timeout="3s">
      <audio src="z-anythingelse.au">
        <break msec="150"/>Anything else? </audio> </prompt>
      <goto nextitem="planetnc2"/>
    </block>
```

To make the natural commands grammar available throughout the prototype, it is necessary to set its scope to the document level, as shown in the next figure. It is possible to supercede the natural commands specified in the grammar for any required individual case by specifying the command(s) in a grammar set to a lower level (such as the form level).

Figure 14. Setting the Scope of the Natural Commands Grammar

```
</catch>
<grammar scope="document" src="planetsnc.jsgf"/>
<filled>
```

The next figures show how to code the prototype's behavior for the different types of information that the natural commands grammar can produce.

Figure 15 shows the following responses for single token responses:

- If the grammar returns 'no', find out if the caller wants to end the call.
- If the grammar returns 'yes', play some example helps.
- If the grammar returns a planet name, branch to play the landmark (then get the topic).
- If the grammar returns a topic, get a planet name.

Figure 15. Programmed Responses for Single Token Inputs (Yes, No, Planet, Topic)

```
<filled>
<if cond="planetnc2 == 'no'">
  <goto next="#confirmexit"/>
</if>
<if cond="planetnc2 == 'yes'">
  <goto nextitem="planetnc2"/>
</if>
<if cond="planetnc2 == 'mercury'">
  <assign name="document.planet" expr="mercury"/>
  <goto next="#playlandmark"/>
</if>
<if cond="planetnc2 == 'moons'">
  <assign name="document.topic" expr="moons"/>
  <goto next="#getplanet"/>
</if>
```

If the grammar returns a planet and a topic, look up the data (then play it for the user), as shown in the following figure.

Figure 16. Programmed Response for Two Token Inputs

```
<if cond="planetnc2 == 'mercury distance'">
  <assign name="document.planet" expr="mercury"/>
  <assign name="document.topic" expr="distance"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'distance mercury'">
  <assign name="document.planet" expr="mercury"/>
  <assign name="document.topic" expr="distance"/>
  <goto next="#lookupdata"/>
</if>
```

Even for just these two tokens (9 planets and 7 topics), this takes a lot of <if>s (63 to be exact) – and you need to check for both orders ("planet topic" and "topic planet", as shown in the figure above), for a total of 126 if statements. It's not hard to code, but it is tedious.

Discussion

Key Features of the Natural Commands User Interface

The report has described a concrete example of converting a directed-dialog prototype VoiceXML program to a natural-commands prototype. Some of the key features of the resulting program are:

- Natural command grammar (always available)
- System prompts consistent with natural commands
- Nondirective initial prompt (several versions)
- Example helps
- Fallback to directed dialog
- System response dependent on number of tokens in command
- If get planet, ask for topic
- If get topic, ask for planet
- If get both, play the appropriate information

The Path from Directed Dialog to Natural Commands

You can reuse much of the code from the original directed dialog, but you do need to make some changes. To get from the directed dialog user interface to one based on natural commands, you must:

- Write a complex natural commands grammar. You can start fairly small, then through iterative tests with users, increase the habitability (coverage) of the grammar.
- Put a nondirective prompt 'shell' around the directed dialog code. This shell includes the enabling the natural commands grammar so it is available throughout the application, providing the nondirective prompt, and providing the example helps.
- Expand the <if> statements so they can provide the correct branch for multiple-token inputs and for any single-token inputs provided in any order.

Key Advantages and Limitations of Natural Commands Applications Relative to NLU Applications

At the user interface, a well-designed natural commands application has many of the same features as a well-designed application built with IBM's Natural Language Understanding (NLU) technologies.

The key advantage of a natural commands application relative to an NLU application is the extent to which it can reuse existing code written for a directed dialog.

The key disadvantage is the difficulty of writing a finite-state grammar that provides the same (or close to the same) flexibility of expression as the statistical language model (SLM) component of an NLU application.

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Appendix A: Hello Worlds Version 4b

```
<?xml version="1.0" encoding="iso-8859-1"?>
<!DOCTYPE vxml PUBLIC "vxml" "">
<vxml version="1.0">

<ibmlexicon>
  <word spelling="uranus"
    pronunciation="j&#602;&#712;&#601;.n&#652;s"/>
</ibmlexicon>

<var name="skipintro" expr="'play'"/>
<var name="helpcounter" expr="0"/>
<var name="distance" expr="'undefined'"/>
<var name="position" expr="'undefined'"/>
<var name="orbit" expr="'undefined'"/>
<var name="temperature" expr="'undefined'"/>
<var name="size" expr="'undefined'"/>
<var name="atmosphere" expr="'undefined'"/>
<var name="moons" expr="'undefined'"/>
<var name="goback" expr="'undefined'"/>
<var name="currentform" expr="'undefined'"/>

<link next="#helloworlds">
  <grammar>(main menu) | (start over)</grammar>
</link>

<link next="#confirmexit">
  <grammar>goodbye | exit</grammar>
</link>

<link next="#goback">
  <grammar>go back</grammar>
</link>

<form id="helloworlds">
  <block name='introduction'>
    <assign name="helpcounter" expr="0"/>
    <assign name="currentform" expr="'helloworlds'"/>
    <if cond="skipintro == 'skip'">
      <goto nextitem="planet"/>
    </if>
    <audio src="z-intro.au">
      Welcome to Hello Worlds! Your voice site for information
      about the planets of the solar system. You can say help
      or repeat at any time.
    </audio>
  </block>
  <field name='planet'>
    <prompt>
      <break msec="150"/>
      <audio src="z-main.au">
        Select a planet. <break msec="3000"/>
      </audio>
    </prompt>
  </field>
</form>
```

```

    Say Mercury, <break msec="750"/> Venus, <break
    msec="750"/> Earth, <break msec="750"/> Mars,
    <break msec="750"/> Jupiter, <break msec="750"/>
    Saturn, <break msec="750"/> Uranus, <break
    msec="750"/> Neptune, <break msec="750"/> Pluto,
    <break msec="750"/> or Exit.
  </audio>
</prompt>
<catch event="help noinput nomatch">
  <assign name="helpcounter" expr="helpcounter+1"/>
  <if cond="helpcounter == 1">
    <audio src="z-mainhelp1.au">
      <break msec="150"/>Please say the name of a planet.
      <break msec="2000"/>
      Select Mercury, Venus, Earth, Mars, Jupiter, Saturn,
      Uranus, Neptune, or Pluto.
    </audio>
  </if>
  <if cond="helpcounter == 2">
    <audio src="z-anytime.au">
      <break msec="150"/>At any time you can say Help,
      Repeat, Go Back, Start Over, or Exit.
    </audio>
    <audio src="z-mainhelp2.au">
      To continue, say Mercury, Venus, Earth, Mars, Jupiter,
      Saturn, Uranus, Neptune, or Pluto.
    </audio>
    <assign name="helpcounter" expr="0"/>
  </if>
</catch>
<grammar>
  mercury | venus | earth | mars | jupiter |
  saturn | uranus | neptune | pluto
</grammar>
<filled>
  <assign name="document.planet" expr="planet"/>
  <assign name="document.skipintro" expr="'skip'"/>
  <goto next="#playlandmark"/>
</filled>
</field>
</form>

<form id="playlandmark">
  <block>
    <audio src="triple.au"/>
    <break msec="150"/>
    <if cond="document.planet=='mercury'">
      <audio src="z-mercury.au">
        <break msec="150"/><value expr="document.planet"/>
      </audio>
    </if>
    <if cond="document.planet=='venus'">
      <audio src="z-venus.au">
        <break msec="150"/><value expr="document.planet"/>

```

```

    </audio>
  </if>
  <if cond="document.planet=='earth'">
    <audio src="z-earth.au">
      <break msec="150"/><value expr="document.planet"/>
    </audio>
  </if>
  <if cond="document.planet=='mars'">
    <audio src="z-mars.au">
      <break msec="150"/><value expr="document.planet"/>
    </audio>
  </if>
  <if cond="document.planet=='jupiter'">
    <audio src="z-jupiter.au">
      <break msec="150"/><value expr="document.planet"/>
    </audio>
  </if>
  <if cond="document.planet=='saturn'">
    <audio src="z-saturn.au">
      <break msec="150"/><value expr="document.planet"/>
    </audio>
  </if>
  <if cond="document.planet=='uranus'">
    <audio src="z-uranus.au">
      <break msec="150"/><value expr="document.planet"/>
    </audio>
  </if>
  <if cond="document.planet=='neptune'">
    <audio src="z-neptune.au">
      <break msec="150"/><value expr="document.planet"/>
    </audio>
  </if>
  <if cond="document.planet=='pluto'">
    <audio src="z-pluto.au">
      <break msec="150"/><value expr="document.planet"/>
    </audio>
  </if>
  <break msec="150"/>
  <audio src="triple.au"/>
  <goto next="#gettopic"/>
</block>
</form>

<form id='gettopic'>
  <block>
    <assign name="helpcounter" expr="0"/>
    <assign name="document.goback" expr="'helloworlds'"/>
    <assign name="currentform" expr="'gettopic'"/>
  </block>
  <field name="topic">
    <prompt>
      <break msec="150"/>
      <audio src="z-selectatopic.au">
        Select a topic.

```

```

</audio>
<audio src="z-list.au">
  <break msec="3000"/>Say Distance from Sun,
  <break msec="750"/> Orbital Period,
  <break msec="750"/> Temperature, <break msec="750"/>
  Size, <break msec="750"/> Atmospheric Composition,
  <break msec="750"/> Number of Moons,
  <break msec="750"/> or Tell Me Everything.
</audio>
</prompt>
  <catch event="help noinput nomatch">
    <assign name="helpcounter" expr="helpcounter+1"/>
    <if cond="helpcounter == 1">
      <audio src="z-topichelp1.au">
        <break msec="150"/>Please say the topic you're
        interested in. Select Distance from Sun, Orbital
        Period, Temperature, Size, Atmospheric Composition,
        Number of Moons, or Tell Me Everything.
      </audio>
    </if>
    <if cond="helpcounter == 2">
      <audio src="z-anytime.au">
        <break msec="150"/>At any time you can say Help,
        Repeat, Go Back, Start Over, or Exit.
      </audio>
      <audio src="z-topichelp2.au">
        To continue, say Distance from Sun, Orbital Period,
        Temperature, Size, Atmospheric Composition, Number of
        Moons, or Tell Me Everything.
      </audio>
      <assign name="helpcounter" expr="0"/>
    </if>
  </catch>
<grammar>
  distance from sun {distance}| orbital period {orbit}|
  temperature | size | atmospheric composition
  {atmosphere}| number of moons {moons}| tell me everything
  {all} | no {goback} | that not right {goback}
</grammar>
<filled>
  <assign name="document.topic" expr="topic"/>
  <if cond="topic=='goback'">
    <goto next="#helloworlds"/>
  </if>
  <goto next="#lookupdata"/>
</filled>
</field>
</form>

<form id='lookupdata'>
  <block>
    <if cond="document.planet == 'mercury'">
      <assign name="document.distance" expr="'58 million
      kilometers'"/>
    </if>
  </block>

```



```

<assign name="document.position" expr="'the closest
planet to the sun'"/>
<assign name="document.orbit" expr="'88 days'"/>
<assign name="document.temperature" expr="'440 degrees
Celsius'"/>
<assign name="document.size" expr="'next to smallest'"/>
<assign name="document.atmosphere" expr="'98% helium, 2%
hydrogen'"/>
<assign name="document.moons" expr="'no moons'"/>
</if>
<if cond="document.planet == 'venus'">
<assign name="document.distance" expr="'108 million
kilometers'"/>
<assign name="document.position" expr="'the second planet
from the sun'"/>
<assign name="document.orbit" expr="'224 days'"/>
<assign name="document.temperature" expr="'457 degrees
Celsius, the hottest in the solar
system due to a runaway greenhouse effect'"/>
<assign name="document.size" expr="'sixth largest'"/>
<assign name="document.atmosphere" expr="'97% carbon
dioxide, 3% nitrogen'"/>
<assign name="document.moons" expr="'no moons'"/>
</if>
<if cond="document.planet == 'earth'">
<assign name="document.distance" expr="'150 million
kilometers'"/>
<assign name="document.position" expr="'the third planet
from the sun'"/>
<assign name="document.orbit" expr="'365 days'"/>
<assign name="document.temperature" expr="'15 degrees
Celsius'"/>
<assign name="document.size" expr="'fifth largest'"/>
<assign name="document.atmosphere" expr="'79% nitrogen,
21% oxygen'"/>
<assign name="document.moons" expr="'one moon'"/>
</if>
<if cond="document.planet == 'mars'">
<assign name="document.distance" expr="'228 million
kilometers'"/>
<assign name="document.position" expr="'the fourth planet
from the sun'"/>
<assign name="document.orbit" expr="'687 days'"/>
<assign name="document.temperature" expr="'negative 55
degrees Celsius'"/>
<assign name="document.size" expr="'seventh largest'"/>
<assign name="document.atmosphere" expr="'96% carbon
dioxide, 3% nitrogen, 1% argon'"/>
<assign name="document.moons" expr="'two moons'"/>
</if>
<if cond="document.planet == 'jupiter'">
<assign name="document.distance" expr="'778 million
kilometers'"/>
<assign name="document.position" expr="'the fifth planet

```

```

from the sun'"/>
<assign name="document.orbit" expr="'12 years'"/>
<assign name="document.temperature" expr="'negative 153
degrees Celsius'"/>
<assign name="document.size" expr="'largest'"/>
<assign name="document.atmosphere" expr="'90% hydrogen,
10% helium'"/>
<assign name="document.moons" expr="'39 moons'"/>
</if>
<if cond="document.planet == 'saturn'">
<assign name="document.distance" expr="'1.4 billion
kilometers'"/>
<assign name="document.position" expr="'the sixth planet
from the sun'"/>
<assign name="document.orbit" expr="'29 and a half
years'"/>
<assign name="document.temperature" expr="'negative 185
degrees Celsius'"/>
<assign name="document.size" expr="'next to largest'"/>
<assign name="document.atmosphere" expr="'75% hydrogen,
25% helium'"/>
<assign name="document.moons" expr="'30 moons'"/>
</if>
<if cond="document.planet == 'uranus'">
<assign name="document.distance" expr="'2.9 billion
kilometers'"/>
<assign name="document.position" expr="'the seventh
planet from the sun'"/>
<assign name="document.orbit" expr="'84 years'"/>
<assign name="document.temperature" expr="'negative 215
degrees Celsius'"/>
<assign name="document.size" expr="'third largest'"/>
<assign name="document.atmosphere" expr="'83% hydrogen,
15% helium, 2% methane'"/>
<assign name="document.moons" expr="'21 moons'"/>
</if>
<if cond="document.planet == 'neptune'">
<assign name="document.distance" expr="'4.5 billion
kilometers'"/>
<assign name="document.position" expr="'usually the
eighth planet from the sun'"/>
<assign name="document.orbit" expr="'165 years'"/>
<assign name="document.temperature" expr="'negative 225
degrees Celsius'"/>
<assign name="document.size" expr="'fourth largest'"/>
<assign name="document.atmosphere" expr="'85% hydrogen,
13% helium, 2% methane'"/>
<assign name="document.moons" expr="'eight moons'"/>
</if>
<if cond="document.planet == 'pluto'">
<assign name="document.distance" expr="'5.9 billion
kilometers'"/>
<assign name="document.position" expr="'usually the
farthest planet from the sun'"/>

```

```

    <assign name="document.orbit" expr="'248 and a half
years'"/>
    <assign name="document.temperature" expr="'negative 233
degrees Celsius, only 40
degrees above absolute zero'"/>
    <assign name="document.size" expr="'smallest'"/>
    <assign name="document.atmosphere" expr="'mostly
nitrogen, with some carbon monoxide and methane'"/>
    <assign name="document.moons" expr="'one moon'"/>
  </if>
  <goto next="#playit"/>
</block>
</form>

```

```

<form id='playit'>
  <block>
    <if cond="document.topic == 'distance'">
      At an average distance of <value
      expr="document.distance"/>,
      <value expr="document.planet"/> is <value
      expr="document.position"/>.
    </if>
    <if cond="document.topic == 'orbit'">
      It takes <value expr="document.planet"/> <value
      expr="document.orbit"/> to orbit the sun.
    </if>
    <if cond="document.topic == 'temperature'">
      The average surface temperature of <value
      expr="document.planet"/> is
      <value expr="document.temperature"/>.
    </if>
    <if cond="document.topic == 'size'">
      <value expr="document.planet"/> is the <value
      expr="document.size"/> planet.
    </if>
    <if cond="document.topic == 'atmosphere'">
      The atmosphere of <value expr="document.planet"/>
      contains <value expr="document.atmosphere"/>.
    </if>
    <if cond="document.topic == 'moons'">
      <value expr="document.planet"/> has <value
      expr="document.moons"/>.
    </if>
    <if cond="document.topic == 'all'">
      At an average distance of <value
      expr="document.distance"/>,
      <value expr="document.planet"/> is <value
      expr="document.position"/>, taking <value
      expr="document.orbit"/> to complete its orbit.
      It has an average surface temperature of <value
      expr="document.temperature"/>. The atmosphere is <value
      expr="document.atmosphere"/>. <value
      expr="document.planet"/> is the <value
      expr="document.size"/> planet, and has <value

```

```

    expr="document.moons"/>.
    <goto next="#helloworlds"/>
  </if>
  <goto next="#whatnext"/>
</block>
</form>

<form id='whatnext'>
  <block>
    <assign name="helpcounter" expr="0"/>
    <assign name="document.goback" expr="'helloworlds'"/>
    <assign name="currentform" expr="'whatnext'"/>
  </block>
  <block>
    <break msec="150"/>
    <audio src="z-newplanet.au">
      Select another topic or another planet.
    </audio>
    <break msec="2000"/>
    <if cond="document.planet=='mercury'">
      <audio src="z-moremercury.au">
        For more information about <value
          expr="document.planet"/>,
      </audio>
    </if>
    <if cond="document.planet=='venus'">
      <audio src="z-morevenus.au">
        For more information about <value
          expr="document.planet"/>,
      </audio>
    </if>
    <if cond="document.planet=='earth'">
      <audio src="z-moreearth.au">
        For more information about <value
          expr="document.planet"/>,
      </audio>
    </if>
    <if cond="document.planet=='mars'">
      <audio src="z-moremars.au">
        For more information about <value
          expr="document.planet"/>,
      </audio>
    </if>
    <if cond="document.planet=='jupiter'">
      <audio src="z-morejupiter.au">
        For more information about <value
          expr="document.planet"/>,
      </audio>
    </if>
    <if cond="document.planet=='saturn'">
      <audio src="z-moresaturn.au">
        For more information about <value
          expr="document.planet"/>,
      </audio>

```

```

</if>
<if cond="document.planet=='uranus'">
  <audio src="z-moreuranus.au">
    For more information about <value
      expr="document.planet"/>,
  </audio>
</if>
<if cond="document.planet=='neptune'">
  <audio src="z-moreneptune.au">
    For more information about <value
      expr="document.planet"/>,
  </audio>
</if>
<if cond="document.planet=='pluto'">
  <audio src="z-morepluto.au">
    For more information about <value
      expr="document.planet"/>,
  </audio>
</if>
</block>
<field name="topic2">
  <prompt>
    <audio src="z-list.au">
      select Distance from Sun, <break msec="750"/> Orbital
      Period, <break msec="750"/> Temperature,
      <break msec="750"/> Size, <break msec="750"/>
      Atmospheric Composition, <break msec="750"/> Number of
      Moons, <break msec="750"/> or Tell Me Everything.
    </audio>
  </prompt>
  <catch event="help noinput nomatch">
    <assign name="helpcounter" expr="helpcounter+1"/>
    <if cond="helpcounter == 1">
      <audio src="z-topichelp1.au">
        <break msec="150"/>Please say the topic you're
        interested in. Select Distance from Sun, Orbital
        Period, Temperature, Size, Atmospheric Composition,
        Number of Moons, or Tell Me Everything.
      </audio>
    </if>
    <if cond="helpcounter == 2">
      <audio src="z-anytime.au">
        <break msec="150"/>At any time you can say Help,
        Repeat, Go Back, Start Over, or Exit.
      </audio>
      <audio src="z-topichelp2.au">
        To continue, say Distance from Sun, Orbital Period,
        Temperature, Size, Atmospheric Composition, Number of
        Moons, or Tell Me Everything.
      </audio>
      <assign name="helpcounter" expr="0"/>
    </if>
  </catch>
</grammar>

```

```

distance from sun {distance}| orbital period {orbit}|
temperature | size | atmospheric composition
{atmosphere}| number of moons {moons}| tell me everything
{all} | repeat | mercury | venus | earth | mars | jupiter
| saturn | uranus | neptune | pluto | [select] [another]
topic {newtopic} | [select] [another] planet {newplanet}
</grammar>
<filled>
  <if cond="topic2 == 'newplanet'">
    <goto next="#helloworlds"/>
  </if>
  <if cond="topic2 == 'newtopic'">
    <goto nextitem="topic2"/>
  </if>
  <if cond="topic2 == 'mercury'">
    <assign name="document.planet" expr="'mercury'"/>
    <goto next="#playlandmark"/>
  </if>
  <if cond="topic2 == 'venus'">
    <assign name="document.planet" expr="'venus'"/>
    <goto next="#playlandmark"/>
  </if>
  <if cond="topic2 == 'earth'">
    <assign name="document.planet" expr="'earth'"/>
    <goto next="#playlandmark"/>
  </if>
  <if cond="topic2 == 'mars'">
    <assign name="document.planet" expr="'mars'"/>
    <goto next="#playlandmark"/>
  </if>
  <if cond="topic2 == 'jupiter'">
    <assign name="document.planet" expr="'jupiter'"/>
    <goto next="#playlandmark"/>
  </if>
  <if cond="topic2 == 'saturn'">
    <assign name="document.planet" expr="'saturn'"/>
    <goto next="#playlandmark"/>
  </if>
  <if cond="topic2 == 'uranus'">
    <assign name="document.planet" expr="'uranus'"/>
    <goto next="#playlandmark"/>
  </if>
  <if cond="topic2 == 'neptune'">
    <assign name="document.planet" expr="'neptune'"/>
    <goto next="#playlandmark"/>
  </if>
  <if cond="topic2 == 'pluto'">
    <assign name="document.planet" expr="'pluto'"/>
    <goto next="#playlandmark"/>
  </if>
  <if cond="topic2 == 'repeat'">
    <goto next="#playit"/>
  </if>
  <assign name="document.topic" expr="topic2"/>

```

```

    <goto next="#lookupdata"/>
  </filled>
</field>
</form>

<form id='goback'>
  <block>
    <goto expr="'#'+document.goback"/>
  </block>
</form>

<form id='confirmexit'>
  <field name="exitChoice" type="boolean">
    <prompt>
      <break msec="150"/>
      <audio src="z-end.au">
        Do you want to end this call?
      </audio>
    </prompt>
    <catch event="help noinput nomatch">
      <assign name="helpcounter" expr="helpcounter+1"/>
      <if cond="helpcounter == 1">
        <audio src="z-yesnorepeat.au">
          <break msec="150"/>Please say Yes, No, or Repeat.
        </audio>
      </if>
      <if cond="helpcounter == 2">
        <audio src="z-anytime.au">
          <break msec="150"/>At any time you can say Help,
          Repeat, Go Back, Start Over, or Exit.
        </audio>
        <audio src="z-exithelp2.au">
          To end the call, say Yes. To return to Hello Worlds,
          say No.
        </audio>
        <assign name="helpcounter" expr="0"/>
      </if>
    </catch>
    <filled>
      <if cond="exitChoice">
        <goto next="#exit"/>
      <else/>
        <audio src="triple.au"/>
        <break msec="150"/>
        <audio src="z-returning.au">
          Returning.
        </audio>
        <goto expr="'#'+document.currentform"/>
      </if>
    </filled>
  </field>
</form>

<form id='exit'>

```

```
<block>
  <break msec="150"/>
  <audio src="z-bye.au">
    Thanks for calling Hello Worlds.  Goodbye!
  </audio>
  <exit/>
</block>
</form>

</vxml>
```


Appendix B: Grammar for Hello Worlds Natural Commands Prototype

#JSGF V1.0;

grammar planetsnc;

```
public <planetsnc> = <planetsentence>
    | <topicsentence>
    | <planetandtopicsentence>
    | <yessentence>
    | <nosentence>
    | <whatis>
    ;
```

```
<planet> = mercury {mercury}
    | venus {venus}
    | earth {earth}
    | mars {mars}
    | jupiter {jupiter}
    | saturn {saturn}
    | uranus {uranus}
    | neptune {neptune}
    | pluto {pluto}
    ;
```

```
<planets> = mercuries {mercury}
    | venuses {venus}
    | earths {earth}
    | mars {mars}
    | jupiters {jupiter}
    | saturns {saturn}
    | uranus {uranus}
    | neptunes {neptune}
    | plutoes {pluto}
    ;
```

```
<topic> = distance [from the sun] {distance}
    | orbit | orbital period {orbit}
    | temperature {temperature}
    | size {size}
    | atmosphere | atmospheric composition {atmosphere}
    | [number of] moons {moons}
    ;
```

```
<sentencestarters> = I would like to know about
    | I want to know about
    | [please] tell me about
    | I would like information about
    | I want information about
    | [please] give me information about
    | [please] tell me the information about
```

;

<sentencestartersall> = I would like to know <everything> about
| I want to know <everything> about
| [please] tell me <everything> about
| I would like <allofthe> information about
| I want <allofthe> information about
| [please] give me <allofthe> information about
| [please] tell me <allofthe> the information about
;

<everything> = everything {all}
| all {all}
;

<allofthe> = all {all}
| all the {all}
| all of the {all}
;

<planetsentence> = <planet>
| <sentencestarters> <planet>
| <sentencestartersall> <planet>
;

<topicsentence> = <topic>
| <sentencestarters> [the] <topic>
;

<planetandtopicsentence> = <distancesentences>
| <orbitsentences>
| <temperaturesentences>
| <sizesentences>
| <atmospheresentences>
| <moonsentences>
| <generalsentences>
;

<distancesentences> = how far is <planet> from the sun {distance}
| what is the distance of <planet> from the sun {distance}
| <planet> is how far from the sun {distance}
| what is <planets> distance from the sun {distance}
;

<orbitsentences> = what is the orbital period of <planet> {orbit}
| how long does it take <planet> to orbit the sun {orbit}
| how long does it take <planet> to go around the sun {orbit}
| what is <planets> orbital period {orbit}
;

<temperaturesentences> = how hot is <planet> {temperature}
| how cold is <planet> {temperature}
| what is the temperature of <planet> {temperature}
| what is <planets> temperature {temperature}

```

;

<sizesentences> = what is the [relative] size of <planet> {size}
| how big is <planet> {size}
| what is <planets> [relative] size {size}
;

<atmospheresentences> = what is the atmospheric composition of <planet> {atmosphere}
| what is in the atmosphere of <planet> {atmosphere}
| what is in <planets> atmosphere {atmosphere}
| what does <planet> have in its atmosphere {atmosphere}
| what is <planets> atmosphereic composition
;

<moonsentences> = how many moons does <planet> have {moons}
| does <planet> have any moons {moons}
;

<generalsentences> = <sentencestarters> <generaltopics>
;

<generaltopics> = the <topic> of <planet>
| <planets> <topic>
;

<yessentence> = yes {yes}
| please {yes}
| yes please {yes}
;

<nosentence> = no [thanks] {no}
| no thank you {no}
| nothing [thanks] {no}
| nothing thank you {no}
| nothing else [thank you] {no}
| (not | nothing) now {no}
| (not | nothing) at this time {no}
| I dont (want | need) to know anything else [at this time] {no}
;

```

<whatis> = [<what> is] the hottest planet {venus temperature}
| <what> planet is the hottest {venus temperature}
| [<what> is] the coldest planet {pluto temperature}
| <what> planet is the coldest {pluto temperature}
| [<what> is] the hottest planet {venus temperature}
| <what> planet has the hottest [surface] temperature {venus temperature}
| <what> planet has the coldest [surface] temperature {pluto temperature}
| [<what> is] the farthest planet [from the sun | from earth] {pluto distance}
| <what> planet is [the] farthest [from the sun | from earth] {pluto distance}
| [<what> is] the closest planet [to the sun] {mercury distance}
| <what> planet is [the] closest [to the sun] {mercury distance}
| [<what> is] the closest planet to earth {mars distance}
| <what> planet is [the] closest to earth {mars distance}
| [<what> is] the <largest> planet {jupiter size}
| <what> planet is the <largest> {jupiter size}
| [<what> is] the smallest planet {pluto size}
| <what> planet is the smallest {pluto size}
| <what> planet has the (fastest | shortest) (orbit | orbital period) {mercury orbit}
| <what> planet has the (longest | slowest) (orbit | orbital period) {pluto orbit}
| <what> planet is the fastest {mercury orbit}
| [<what> is] the fastest planet {mercury orbit}
| <what> planet is the slowest {pluto orbit}
| [<what> is] the slowest planet {pluto orbit}
| <what> planet has the most moons {jupiter moons}
;

<largest> = largest
| biggest
;

<what> = what
| which
;

Appendix C: Hello Worlds Version 5

```
<?xml version="1.0" encoding="iso-8859-1"?>
<!DOCTYPE vxml PUBLIC "vxml" "">
<vxml version="1.0">

<ibmlexicon>
  <word spelling="uranus" pronunciation="j&#602;&#712;&#601;.n&#652;s"/>
</ibmlexicon>

<var name="firsttime" expr="yes"/>
<var name="secondtime" expr="yes"/>
<var name="helpcounter" expr="0"/>
<var name="input" expr="none"/>
<var name="distance" expr="undefined"/>
<var name="position" expr="undefined"/>
<var name="orbit" expr="undefined"/>
<var name="temperature" expr="undefined"/>
<var name="size" expr="undefined"/>
<var name="atmosphere" expr="undefined"/>
<var name="moons" expr="undefined"/>
<var name="goback" expr="undefined"/>
<var name="currentform" expr="undefined"/>

<link next="#helloworlds2">
  <grammar>(main menu) | (start over)</grammar>
</link>

<link next="#confirmexit">
  <grammar>goodbye | exit</grammar>
</link>

<link next="#goback">
  <grammar>go back</grammar>
</link>

<form id="helloworlds">
  <block>
    <assign name="helpcounter" expr="0"/>
    <assign name="currentform" expr="helloworlds"/>
    <assign name="goback" expr="helloworlds"/>
    <if cond="firsttime == 'no'">
      <goto nextitem="planetnc"/>
    </if>
    <audio src="z-intronc.au">
      Welcome to Hello Worlds! Your voice site for information about the planets
      of the solar system, now with natural commands.
      At any time, you can ask for information about a planet of the solar system.
      If you're not sure what to say, just say Help.
    </audio>
    <assign name="document.firsttime" expr="no"/>
  </block>
  <field name='planetnc'>
```

```

<prompt timeout="3s">
<break msec="150"/>
<audio src="z-wwwlthk.au">
  What would you like to know?
</audio>
</prompt>
<catch event="help noinput nomatch">
<assign name="helpcounter" expr="helpcounter+1"/>
<if cond="helpcounter == 1">
<prompt timeout="7s">
  <audio src="z-mainhelpnc1.au">
    <break msec="150"/>For example, you could ask a question like How Far Is Pluto From The
    Sun, What Is The Orbital Period of Mercury, or How Hot Is Venus.
  </audio>
  </prompt>
</if>
<if cond="helpcounter == 2">
<prompt timeout="7s">
  <audio src="z-mainhelpnc2.au">
    <break msec="150"/>Let's try again. You could say How Many Moons Does Jupiter
    Have, What Does Mars Have In Its Atmosphere, or Tell Me Everything About Saturn.
  </audio>
  </prompt>
</if>
<if cond="helpcounter == 3">
  <assign name="helpcounter" expr="0"/>
  <goto next="#mainmenu"/>
</if>
</catch>
<grammar src="planetsnc.jsgf"/>
<filled>
<if cond="planetnc == 'mercury'">
  <assign name="document.planet" expr="'mercury'"/>
  <goto next="#playlandmark"/>
</if>
<if cond="planetnc == 'venus'">
  <assign name="document.planet" expr="'venus'"/>
  <goto next="#playlandmark"/>
</if>
<if cond="planetnc == 'earth'">
  <assign name="document.planet" expr="'earth'"/>
  <goto next="#playlandmark"/>
</if>
<if cond="planetnc == 'mars'">
  <assign name="document.planet" expr="'mars'"/>
  <goto next="#playlandmark"/>
</if>
<if cond="planetnc == 'jupiter'">
  <assign name="document.planet" expr="'jupiter'"/>
  <goto next="#playlandmark"/>
</if>
<if cond="planetnc == 'saturn'">
  <assign name="document.planet" expr="'saturn'"/>
  <goto next="#playlandmark"/>

```

```

</if>
<if cond="planetnc == 'uranus'">
  <assign name="document.planet" expr="uranus"/>
  <goto next="#playlandmark"/>
</if>
<if cond="planetnc == 'neptune'">
  <assign name="document.planet" expr="neptune"/>
  <goto next="#playlandmark"/>
</if>
<if cond="planetnc == 'pluto'">
  <assign name="document.planet" expr="pluto"/>
  <goto next="#playlandmark"/>
</if>
<if cond="planetnc == 'distance'">
  <assign name="document.topic" expr="distance"/>
  <goto next="#getplanet"/>
</if>
<if cond="planetnc == 'orbit'">
  <assign name="document.topic" expr="orbit"/>
  <goto next="#getplanet"/>
</if>
<if cond="planetnc == 'size'">
  <assign name="document.topic" expr="size"/>
  <goto next="#getplanet"/>
</if>
<if cond="planetnc == 'temperature'">
  <assign name="document.topic" expr="temperature"/>
  <goto next="#getplanet"/>
</if>
<if cond="planetnc == 'atmosphere'">
  <assign name="document.topic" expr="atmosphere"/>
  <goto next="#getplanet"/>
</if>
<if cond="planetnc == 'moons'">
  <assign name="document.topic" expr="moons"/>
  <goto next="#getplanet"/>
</if>
<if cond="planetnc == 'all'">
  <assign name="document.topic" expr="all"/>
  <goto next="#getplanet"/>
</if>
<if cond="planetnc == 'mercury distance'">
  <assign name="document.planet" expr="mercury"/>
  <assign name="document.topic" expr="distance"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'mercury orbit'">
  <assign name="document.planet" expr="mercury"/>
  <assign name="document.topic" expr="orbit"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'mercury temperature'">
  <assign name="document.planet" expr="mercury"/>
  <assign name="document.topic" expr="temperature"/>

```

```

<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'mercury size'">
<assign name="document.planet" expr="mercury"/>
<assign name="document.topic" expr="size"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'mercury atmosphere'">
<assign name="document.planet" expr="mercury"/>
<assign name="document.topic" expr="atmosphere"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'mercury moons'">
<assign name="document.planet" expr="mercury"/>
<assign name="document.topic" expr="moons"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'mercury all'">
<assign name="document.planet" expr="mercury"/>
<assign name="document.topic" expr="all"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'venus distance'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="distance"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'venus orbit'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="orbit"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'venus temperature'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="temperature"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'venus size'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="size"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'venus atmosphere'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="atmosphere"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'venus moons'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="moons"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'venus all'">
<assign name="document.planet" expr="venus"/>

```



```

<assign name="document.topic" expr="all"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'earth distance'">
<assign name="document.planet" expr="earth"/>
<assign name="document.topic" expr="distance"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'earth orbit'">
<assign name="document.planet" expr="earth"/>
<assign name="document.topic" expr="orbit"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'earth temperature'">
<assign name="document.planet" expr="earth"/>
<assign name="document.topic" expr="temperature"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'earth size'">
<assign name="document.planet" expr="earth"/>
<assign name="document.topic" expr="size"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'earth atmosphere'">
<assign name="document.planet" expr="earth"/>
<assign name="document.topic" expr="atmosphere"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'earth moons'">
<assign name="document.planet" expr="earth"/>
<assign name="document.topic" expr="moons"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'earth all'">
<assign name="document.planet" expr="earth"/>
<assign name="document.topic" expr="all"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'mars distance'">
<assign name="document.planet" expr="mars"/>
<assign name="document.topic" expr="distance"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'mars orbit'">
<assign name="document.planet" expr="mars"/>
<assign name="document.topic" expr="orbit"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'mars temperature'">
<assign name="document.planet" expr="mars"/>
<assign name="document.topic" expr="temperature"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'mars size'">

```

```

<assign name="document.planet" expr="mars"/>
<assign name="document.topic" expr="size"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'mars atmosphere'">
<assign name="document.planet" expr="mars"/>
<assign name="document.topic" expr="atmosphere"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'mars moons'">
<assign name="document.planet" expr="mars"/>
<assign name="document.topic" expr="moons"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'mars all'">
<assign name="document.planet" expr="mars"/>
<assign name="document.topic" expr="all"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'jupiter distance'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="distance"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'jupiter orbit'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="orbit"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'jupiter temperature'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="temperature"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'jupiter size'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="size"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'jupiter atmosphere'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="atmosphere"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'jupiter moons'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="moons"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'jupiter all'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="all"/>
<goto next="#lookupdata"/>
</if>

```

```

<if cond="planetnc == 'saturn distance'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="distance"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'saturn orbit'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="orbit"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'saturn temperature'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="temperature"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'saturn size'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="size"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'saturn atmosphere'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="atmosphere"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'saturn moons'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="moons"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'saturn all'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="all"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'uranus distance'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="distance"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'uranus orbit'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="orbit"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'uranus temperature'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="temperature"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'uranus size'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="size"/>
  <goto next="#lookupdata"/>

```

```

</if>
<if cond="planetnc == 'uranus atmosphere'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="atmosphere"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'uranus moons'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="moons"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'uranus all'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="all"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'neptune distance'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="distance"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'neptune orbit'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="orbit"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'neptune temperature'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="temperature"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'neptune size'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="size"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'neptune atmosphere'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="atmosphere"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'neptune moons'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="moons"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'neptune all'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="all"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'pluto distance'">
  <assign name="document.planet" expr="pluto"/>
  <assign name="document.topic" expr="distance"/>

```

```

<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'pluto orbit'">
<assign name="document.planet" expr="'pluto'"/>
<assign name="document.topic" expr="'orbit'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'pluto temperature'">
<assign name="document.planet" expr="'pluto'"/>
<assign name="document.topic" expr="'temperature'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'pluto size'">
<assign name="document.planet" expr="'pluto'"/>
<assign name="document.topic" expr="'size'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'pluto atmosphere'">
<assign name="document.planet" expr="'pluto'"/>
<assign name="document.topic" expr="'atmosphere'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'pluto moons'">
<assign name="document.planet" expr="'pluto'"/>
<assign name="document.topic" expr="'moons'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'pluto all'">
<assign name="document.planet" expr="'pluto'"/>
<assign name="document.topic" expr="'all'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'distance mercury'">
<assign name="document.planet" expr="'mercury'"/>
<assign name="document.topic" expr="'distance'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'orbit mercury'">
<assign name="document.planet" expr="'mercury'"/>
<assign name="document.topic" expr="'orbit'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'temperature mercury'">
<assign name="document.planet" expr="'mercury'"/>
<assign name="document.topic" expr="'temperature'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'size mercury'">
<assign name="document.planet" expr="'mercury'"/>
<assign name="document.topic" expr="'size'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'atmosphere mercury'">
<assign name="document.planet" expr="'mercury'"/>

```

```

<assign name="document.topic" expr="atmosphere"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'moons mercury'">
<assign name="document.planet" expr="mercury"/>
<assign name="document.topic" expr="moons"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'all mercury'">
<assign name="document.planet" expr="mercury"/>
<assign name="document.topic" expr="all"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'distance venus'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="distance"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'orbit venus'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="orbit"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'temperature venus'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="temperature"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'size venus'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="size"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'atmosphere venus'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="atmosphere"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'moons venus'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="moons"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'all venus'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="all"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'distance earth'">
<assign name="document.planet" expr="earth"/>
<assign name="document.topic" expr="distance"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'orbit earth'">

```

```

<assign name="document.planet" expr="'earth'"/>
<assign name="document.topic" expr="'orbit'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'temperature earth'">
<assign name="document.planet" expr="'earth'"/>
<assign name="document.topic" expr="'temperature'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'size earth'">
<assign name="document.planet" expr="'earth'"/>
<assign name="document.topic" expr="'size'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'atmosphere earth'">
<assign name="document.planet" expr="'earth'"/>
<assign name="document.topic" expr="'atmosphere'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'moons earth'">
<assign name="document.planet" expr="'earth'"/>
<assign name="document.topic" expr="'moons'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'all earth'">
<assign name="document.planet" expr="'earth'"/>
<assign name="document.topic" expr="'all'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'distance mars'">
<assign name="document.planet" expr="'mars'"/>
<assign name="document.topic" expr="'distance'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'orbit mars'">
<assign name="document.planet" expr="'mars'"/>
<assign name="document.topic" expr="'orbit'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'temperature mars'">
<assign name="document.planet" expr="'mars'"/>
<assign name="document.topic" expr="'temperature'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'size mars'">
<assign name="document.planet" expr="'mars'"/>
<assign name="document.topic" expr="'size'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'atmosphere mars'">
<assign name="document.planet" expr="'mars'"/>
<assign name="document.topic" expr="'atmosphere'"/>
<goto next="#lookupdata"/>
</if>

```

```

<if cond="planetnc == 'moons mars'">
  <assign name="document.planet" expr="mars"/>
  <assign name="document.topic" expr="moons"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'all mars'">
  <assign name="document.planet" expr="mars"/>
  <assign name="document.topic" expr="all"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'distance jupiter'">
  <assign name="document.planet" expr="jupiter"/>
  <assign name="document.topic" expr="distance"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'orbit jupiter'">
  <assign name="document.planet" expr="jupiter"/>
  <assign name="document.topic" expr="orbit"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'temperature jupiter'">
  <assign name="document.planet" expr="jupiter"/>
  <assign name="document.topic" expr="temperature"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'size jupiter'">
  <assign name="document.planet" expr="jupiter"/>
  <assign name="document.topic" expr="size"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'atmosphere jupiter'">
  <assign name="document.planet" expr="jupiter"/>
  <assign name="document.topic" expr="atmosphere"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'moons jupiter'">
  <assign name="document.planet" expr="jupiter"/>
  <assign name="document.topic" expr="moons"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'all jupiter'">
  <assign name="document.planet" expr="jupiter"/>
  <assign name="document.topic" expr="all"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'distance saturn'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="distance"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'orbit saturn'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="orbit"/>
  <goto next="#lookupdata"/>

```



```

</if>
<if cond="planetnc == 'temperature saturn'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="temperature"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'size saturn'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="size"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'atmosphere saturn'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="atmosphere"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'moons saturn'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="moons"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'all saturn'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="all"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'distance uranus'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="distance"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'orbit uranus'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="orbit"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'temperature uranus'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="temperature"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'size uranus'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="size"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'atmosphere uranus'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="atmosphere"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'moons uranus'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="moons"/>

```

```

<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'all uranus'">
<assign name="document.planet" expr="uranus"/>
<assign name="document.topic" expr="all"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'distance neptune'">
<assign name="document.planet" expr="neptune"/>
<assign name="document.topic" expr="distance"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'orbit neptune'">
<assign name="document.planet" expr="neptune"/>
<assign name="document.topic" expr="orbit"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'temperature neptune'">
<assign name="document.planet" expr="neptune"/>
<assign name="document.topic" expr="temperature"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'size neptune'">
<assign name="document.planet" expr="neptune"/>
<assign name="document.topic" expr="size"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'atmosphere neptune'">
<assign name="document.planet" expr="neptune"/>
<assign name="document.topic" expr="atmosphere"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'moons neptune'">
<assign name="document.planet" expr="neptune"/>
<assign name="document.topic" expr="moons"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'all neptune'">
<assign name="document.planet" expr="neptune"/>
<assign name="document.topic" expr="all"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'distance pluto'">
<assign name="document.planet" expr="pluto"/>
<assign name="document.topic" expr="distance"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'orbit pluto'">
<assign name="document.planet" expr="pluto"/>
<assign name="document.topic" expr="orbit"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'temperature pluto'">
<assign name="document.planet" expr="pluto"/>

```

```

<assign name="document.topic" expr="'temperature'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'size pluto'">
<assign name="document.planet" expr="'pluto'"/>
<assign name="document.topic" expr="'size'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'atmosphere pluto'">
<assign name="document.planet" expr="'pluto'"/>
<assign name="document.topic" expr="'atmosphere'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'moons pluto'">
<assign name="document.planet" expr="'pluto'"/>
<assign name="document.topic" expr="'moons'"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc == 'all pluto'">
<assign name="document.planet" expr="'pluto'"/>
<assign name="document.topic" expr="'all'"/>
<goto next="#lookupdata"/>
</if>
<prompt>
<audio src="z-different.au">
<break msec="150"/>Try asking that question in a different way.
</audio>
</prompt>
<goto next="#helloworlds"/>
</filled>
</field>
</form>

```

```

<form id='helloworlds2'>
<block name="secondprompt">
<assign name="helpcounter" expr="0"/>
<assign name="currentform" expr="helloworlds2"/>
<assign name="goback" expr="helloworlds2"/>
<if cond="secondtime == 'no'">
<goto nextitem="lastprompt"/>
</if>
<prompt timeout="3s">
<audio src="z-wewyltk.au">
<break msec="150"/>What else would you like to know?
</audio>
</prompt>
<assign name="secondtime" expr="no"/>
<goto nextitem="planetnc2"/>
</block>
<block name="lastprompt">
<prompt timeout="3s">
<audio src="z-anythingelse.au">
<break msec="150"/>Anything else?
</audio>

```

```

</prompt>
<goto nextitem="planetnc2"/>
</block>
<field name='planetnc2'>
<catch event="help noinput nomatch">
<assign name="helpcounter" expr="helpcounter+1"/>
<if cond="helpcounter == 1">
<prompt timeout="7s">
<audio src="z-mainhelpnc1.au">
<break msec="150"/>For example, you could ask a question like How Far Is Pluto From The
Sun, What Is The Orbital Period of Mercury, or How Hot Is Venus.
</audio>
</prompt>
</if>
<if cond="helpcounter == 2">
<prompt timeout="7s">
<audio src="z-mainhelpnc2.au">
<break msec="150"/>Let's try again. You could say How Many Moons Does Jupiter
Have, What Does Mars Have In Its Atmosphere, or Tell Me Everything About Saturn.
</audio>
</prompt>
</if>
<if cond="helpcounter == 3">
<assign name="helpcounter" expr="0"/>
<goto next="#mainmenu"/>
</if>
</catch>
<grammar scope="document" src="planetsnc.jsgf"/>
<filled>
<if cond="planetnc2 == 'no'">
<goto next="#confirmexit"/>
</if>
<if cond="planetnc2 == 'yes'">
<goto nextitem="planetnc2"/>
</if>
<if cond="planetnc2 == 'mercury'">
<assign name="document.planet" expr="'mercury'"/>
<goto next="#playlandmark"/>
</if>
<if cond="planetnc2 == 'venus'">
<assign name="document.planet" expr="'venus'"/>
<goto next="#playlandmark"/>
</if>
<if cond="planetnc2 == 'earth'">
<assign name="document.planet" expr="'earth'"/>
<goto next="#playlandmark"/>
</if>
<if cond="planetnc2 == 'mars'">
<assign name="document.planet" expr="'mars'"/>
<goto next="#playlandmark"/>
</if>
<if cond="planetnc2 == 'jupiter'">
<assign name="document.planet" expr="'jupiter'"/>
<goto next="#playlandmark"/>

```

```

</if>
<if cond="planetnc2 == 'saturn'">
  <assign name="document.planet" expr="'saturn'"/>
  <goto next="#playlandmark"/>
</if>
<if cond="planetnc2 == 'uranus'">
  <assign name="document.planet" expr="'uranus'"/>
  <goto next="#playlandmark"/>
</if>
<if cond="planetnc2 == 'neptune'">
  <assign name="document.planet" expr="'neptune'"/>
  <goto next="#playlandmark"/>
</if>
<if cond="planetnc2 == 'pluto'">
  <assign name="document.planet" expr="'pluto'"/>
  <goto next="#playlandmark"/>
</if>
<if cond="planetnc2 == 'distance'">
  <assign name="document.topic" expr="'distance'"/>
  <goto next="#getplanet"/>
</if>
<if cond="planetnc2 == 'orbit'">
  <assign name="document.topic" expr="'orbit'"/>
  <goto next="#getplanet"/>
</if>
<if cond="planetnc2 == 'size'">
  <assign name="document.topic" expr="'size'"/>
  <goto next="#getplanet"/>
</if>
<if cond="planetnc2 == 'temperature'">
  <assign name="document.topic" expr="'temperature'"/>
  <goto next="#getplanet"/>
</if>
<if cond="planetnc2 == 'atmosphere'">
  <assign name="document.topic" expr="'atmosphere'"/>
  <goto next="#getplanet"/>
</if>
<if cond="planetnc2 == 'moons'">
  <assign name="document.topic" expr="'moons'"/>
  <goto next="#getplanet"/>
</if>
<if cond="planetnc2 == 'all'">
  <assign name="document.topic" expr="'all'"/>
  <goto next="#getplanet"/>
</if>
<if cond="planetnc2 == 'mercury distance'">
  <assign name="document.planet" expr="'mercury'"/>
  <assign name="document.topic" expr="'distance'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'mercury orbit'">
  <assign name="document.planet" expr="'mercury'"/>
  <assign name="document.topic" expr="'orbit'"/>
  <goto next="#lookupdata"/>

```

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</if>
<if cond="planetnc2 == 'mercury temperature'">
  <assign name="document.planet" expr="mercury"/>
  <assign name="document.topic" expr="temperature"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'mercury size'">
  <assign name="document.planet" expr="mercury"/>
  <assign name="document.topic" expr="size"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'mercury atmosphere'">
  <assign name="document.planet" expr="mercury"/>
  <assign name="document.topic" expr="atmosphere"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'mercury moons'">
  <assign name="document.planet" expr="mercury"/>
  <assign name="document.topic" expr="moons"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'mercury all'">
  <assign name="document.planet" expr="mercury"/>
  <assign name="document.topic" expr="all"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'venus distance'">
  <assign name="document.planet" expr="venus"/>
  <assign name="document.topic" expr="distance"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'venus orbit'">
  <assign name="document.planet" expr="venus"/>
  <assign name="document.topic" expr="orbit"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'venus temperature'">
  <assign name="document.planet" expr="venus"/>
  <assign name="document.topic" expr="temperature"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'venus size'">
  <assign name="document.planet" expr="venus"/>
  <assign name="document.topic" expr="size"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'venus atmosphere'">
  <assign name="document.planet" expr="venus"/>
  <assign name="document.topic" expr="atmosphere"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'venus moons'">
  <assign name="document.planet" expr="venus"/>
  <assign name="document.topic" expr="moons"/>

```

```

<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'venus all'">
  <assign name="document.planet" expr="'venus'"/>
  <assign name="document.topic" expr="'all'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'earth distance'">
  <assign name="document.planet" expr="'earth'"/>
  <assign name="document.topic" expr="'distance'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'earth orbit'">
  <assign name="document.planet" expr="'earth'"/>
  <assign name="document.topic" expr="'orbit'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'earth temperature'">
  <assign name="document.planet" expr="'earth'"/>
  <assign name="document.topic" expr="'temperature'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'earth size'">
  <assign name="document.planet" expr="'earth'"/>
  <assign name="document.topic" expr="'size'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'earth atmosphere'">
  <assign name="document.planet" expr="'earth'"/>
  <assign name="document.topic" expr="'atmosphere'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'earth moons'">
  <assign name="document.planet" expr="'earth'"/>
  <assign name="document.topic" expr="'moons'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'earth all'">
  <assign name="document.planet" expr="'earth'"/>
  <assign name="document.topic" expr="'all'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'mars distance'">
  <assign name="document.planet" expr="'mars'"/>
  <assign name="document.topic" expr="'distance'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'mars orbit'">
  <assign name="document.planet" expr="'mars'"/>
  <assign name="document.topic" expr="'orbit'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'mars temperature'">
  <assign name="document.planet" expr="'mars'"/>

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<assign name="document.topic" expr="temperature"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'mars size'">
<assign name="document.planet" expr="mars"/>
<assign name="document.topic" expr="size"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'mars atmosphere'">
<assign name="document.planet" expr="mars"/>
<assign name="document.topic" expr="atmosphere"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'mars moons'">
<assign name="document.planet" expr="mars"/>
<assign name="document.topic" expr="moons"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'mars all'">
<assign name="document.planet" expr="mars"/>
<assign name="document.topic" expr="all"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'jupiter distance'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="distance"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'jupiter orbit'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="orbit"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'jupiter temperature'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="temperature"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'jupiter size'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="size"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'jupiter atmosphere'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="atmosphere"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'jupiter moons'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="moons"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'jupiter all'">

```



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<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="all"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'saturn distance'">
<assign name="document.planet" expr="saturn"/>
<assign name="document.topic" expr="distance"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'saturn orbit'">
<assign name="document.planet" expr="saturn"/>
<assign name="document.topic" expr="orbit"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'saturn temperature'">
<assign name="document.planet" expr="saturn"/>
<assign name="document.topic" expr="temperature"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'saturn size'">
<assign name="document.planet" expr="saturn"/>
<assign name="document.topic" expr="size"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'saturn atmosphere'">
<assign name="document.planet" expr="saturn"/>
<assign name="document.topic" expr="atmosphere"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'saturn moons'">
<assign name="document.planet" expr="saturn"/>
<assign name="document.topic" expr="moons"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'saturn all'">
<assign name="document.planet" expr="saturn"/>
<assign name="document.topic" expr="all"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'uranus distance'">
<assign name="document.planet" expr="uranus"/>
<assign name="document.topic" expr="distance"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'uranus orbit'">
<assign name="document.planet" expr="uranus"/>
<assign name="document.topic" expr="orbit"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'uranus temperature'">
<assign name="document.planet" expr="uranus"/>
<assign name="document.topic" expr="temperature"/>
<goto next="#lookupdata"/>
</if>

```

```

<if cond="planetnc2 == 'uranus size'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="size"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'uranus atmosphere'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="atmosphere"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'uranus moons'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="moons"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'uranus all'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="all"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'neptune distance'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="distance"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'neptune orbit'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="orbit"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'neptune temperature'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="temperature"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'neptune size'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="size"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'neptune atmosphere'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="atmosphere"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'neptune moons'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="moons"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'neptune all'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="all"/>
  <goto next="#lookupdata"/>

```

```

</if>
<if cond="planetnc2 == 'pluto distance'">
  <assign name="document.planet" expr="'pluto'"/>
  <assign name="document.topic" expr="'distance'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'pluto orbit'">
  <assign name="document.planet" expr="'pluto'"/>
  <assign name="document.topic" expr="'orbit'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'pluto temperature'">
  <assign name="document.planet" expr="'pluto'"/>
  <assign name="document.topic" expr="'temperature'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'pluto size'">
  <assign name="document.planet" expr="'pluto'"/>
  <assign name="document.topic" expr="'size'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'pluto atmosphere'">
  <assign name="document.planet" expr="'pluto'"/>
  <assign name="document.topic" expr="'atmosphere'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'pluto moons'">
  <assign name="document.planet" expr="'pluto'"/>
  <assign name="document.topic" expr="'moons'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'pluto all'">
  <assign name="document.planet" expr="'pluto'"/>
  <assign name="document.topic" expr="'all'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'distance mercury'">
  <assign name="document.planet" expr="'mercury'"/>
  <assign name="document.topic" expr="'distance'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'orbit mercury'">
  <assign name="document.planet" expr="'mercury'"/>
  <assign name="document.topic" expr="'orbit'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'temperature mercury'">
  <assign name="document.planet" expr="'mercury'"/>
  <assign name="document.topic" expr="'temperature'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'size mercury'">
  <assign name="document.planet" expr="'mercury'"/>
  <assign name="document.topic" expr="'size'"/>

```

```

<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'atmosphere mercury'">
<assign name="document.planet" expr="mercury"/>
<assign name="document.topic" expr="atmosphere"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'moons mercury'">
<assign name="document.planet" expr="mercury"/>
<assign name="document.topic" expr="moons"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'all mercury'">
<assign name="document.planet" expr="mercury"/>
<assign name="document.topic" expr="all"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'distance venus'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="distance"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'orbit venus'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="orbit"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'temperature venus'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="temperature"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'size venus'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="size"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'atmosphere venus'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="atmosphere"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'moons venus'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="moons"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'all venus'">
<assign name="document.planet" expr="venus"/>
<assign name="document.topic" expr="all"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'distance earth'">
<assign name="document.planet" expr="earth"/>

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<assign name="document.topic" expr="distance"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'orbit earth'">
<assign name="document.planet" expr="earth"/>
<assign name="document.topic" expr="orbit"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'temperature earth'">
<assign name="document.planet" expr="earth"/>
<assign name="document.topic" expr="temperature"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'size earth'">
<assign name="document.planet" expr="earth"/>
<assign name="document.topic" expr="size"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'atmosphere earth'">
<assign name="document.planet" expr="earth"/>
<assign name="document.topic" expr="atmosphere"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'moons earth'">
<assign name="document.planet" expr="earth"/>
<assign name="document.topic" expr="moons"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'all earth'">
<assign name="document.planet" expr="earth"/>
<assign name="document.topic" expr="all"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'distance mars'">
<assign name="document.planet" expr="mars"/>
<assign name="document.topic" expr="distance"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'orbit mars'">
<assign name="document.planet" expr="mars"/>
<assign name="document.topic" expr="orbit"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'temperature mars'">
<assign name="document.planet" expr="mars"/>
<assign name="document.topic" expr="temperature"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'size mars'">
<assign name="document.planet" expr="mars"/>
<assign name="document.topic" expr="size"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'atmosphere mars'">

```

```

<assign name="document.planet" expr="mars"/>
<assign name="document.topic" expr="atmosphere"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'moons mars'">
<assign name="document.planet" expr="mars"/>
<assign name="document.topic" expr="moons"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'all mars'">
<assign name="document.planet" expr="mars"/>
<assign name="document.topic" expr="all"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'distance jupiter'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="distance"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'orbit jupiter'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="orbit"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'temperature jupiter'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="temperature"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'size jupiter'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="size"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'atmosphere jupiter'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="atmosphere"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'moons jupiter'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="moons"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'all jupiter'">
<assign name="document.planet" expr="jupiter"/>
<assign name="document.topic" expr="all"/>
<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'distance saturn'">
<assign name="document.planet" expr="saturn"/>
<assign name="document.topic" expr="distance"/>
<goto next="#lookupdata"/>
</if>

```

```

<if cond="planetnc2 == 'orbit saturn'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="orbit"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'temperature saturn'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="temperature"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'size saturn'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="size"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'atmosphere saturn'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="atmosphere"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'moons saturn'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="moons"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'all saturn'">
  <assign name="document.planet" expr="saturn"/>
  <assign name="document.topic" expr="all"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'distance uranus'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="distance"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'orbit uranus'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="orbit"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'temperature uranus'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="temperature"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'size uranus'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="size"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'atmosphere uranus'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="atmosphere"/>
  <goto next="#lookupdata"/>

```

```

</if>
<if cond="planetnc2 == 'moons uranus'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="moons"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'all uranus'">
  <assign name="document.planet" expr="uranus"/>
  <assign name="document.topic" expr="all"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'distance neptune'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="distance"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'orbit neptune'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="orbit"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'temperature neptune'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="temperature"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'size neptune'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="size"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'atmosphere neptune'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="atmosphere"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'moons neptune'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="moons"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'all neptune'">
  <assign name="document.planet" expr="neptune"/>
  <assign name="document.topic" expr="all"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'distance pluto'">
  <assign name="document.planet" expr="pluto"/>
  <assign name="document.topic" expr="distance"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'orbit pluto'">
  <assign name="document.planet" expr="pluto"/>
  <assign name="document.topic" expr="orbit"/>

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<goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'temperature pluto'">
  <assign name="document.planet" expr="'pluto'"/>
  <assign name="document.topic" expr="'temperature'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'size pluto'">
  <assign name="document.planet" expr="'pluto'"/>
  <assign name="document.topic" expr="'size'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'atmosphere pluto'">
  <assign name="document.planet" expr="'pluto'"/>
  <assign name="document.topic" expr="'atmosphere'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'moons pluto'">
  <assign name="document.planet" expr="'pluto'"/>
  <assign name="document.topic" expr="'moons'"/>
  <goto next="#lookupdata"/>
</if>
<if cond="planetnc2 == 'all pluto'">
  <assign name="document.planet" expr="'pluto'"/>
  <assign name="document.topic" expr="'all'"/>
  <goto next="#lookupdata"/>
</if>
<prompt>
  <audio src="z-different.au">
    <break msec="150"/>Try asking that question in a different way.
  </audio>
</prompt>
<goto next="#helloworlds2"/>
</filled>
</field>
</form>

<form id="mainmenu">
  <block>
    <assign name="helpcounter" expr="0"/>
    <assign name="currentform" expr="mainmenu"/>
    <assign name="goback" expr="helloworlds2"/>
  </block>
  <field name='main'>
    <prompt>
      <break msec="150"/>
      <audio src="z-onestep.au">
        Let's do this one step at a time.
      </audio>
      <audio src="z-sayplanet.au">
        Say Mercury, <break msec="750"/> Venus, <break msec="750"/> Earth,
        <break msec="750"/> Mars, <break msec="750"/> Jupiter, <break msec="750"/> Saturn,
        <break msec="750"/> Uranus, <break msec="750"/> Neptune, <break msec="750"/>
        Pluto, <break msec="750"/> or Exit.
      </audio>
    </prompt>
  </field>
</form>

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```

</audio>
</prompt>
<catch event="help noinput nomatch">
  <assign name="helpcounter" expr="helpcounter+1"/>
  <if cond="helpcounter == 1">
    <audio src="z-mainhelp1.au">
      <break msec="150"/>Please say the name of a planet. <break msec="2000"/>
      Select Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto.
    </audio>
  </if>
  <if cond="helpcounter == 2">
    <audio src="z-anytime.au">
      <break msec="150"/>At any time you can say Help, Repeat, Go Back, Start Over, or Exit.
    </audio>
    <audio src="z-mainhelp2.au">
      To continue, say Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune,
      or Pluto.
    </audio>
    <assign name="helpcounter" expr="0"/>
  </if>
</catch>
<grammar>
  mercury | venus | earth | mars | jupiter |
  saturn | uranus | neptune | pluto
</grammar>
<filled>
  <assign name="document.planet" expr="main"/>
  <goto next="#playlandmark"/>
</filled>
</field>
</form>

<form id="getplanet">
  <block>
    <assign name="helpcounter" expr="0"/>
    <assign name="currentform" expr="getplanet"/>
    <assign name="goback" expr="helloworlds2"/>
  </block>
  <field name='planet'>
    <prompt>
      <break msec="150"/>
      <audio src="z-whichplanet.au">
        For which planet? <break msec="3000"/>
      </audio>
      <audio src="z-sayplanet.au">
        Say Mercury, <break msec="750"/> Venus, <break msec="750"/> Earth,
        <break msec="750"/> Mars, <break msec="750"/> Jupiter, <break msec="750"/> Saturn,
        <break msec="750"/> Uranus, <break msec="750"/> Neptune, <break msec="750"/>
        Pluto, <break msec="750"/> or Exit.
      </audio>
    </prompt>
  </field>
</form>
<catch event="help noinput nomatch">
  <assign name="helpcounter" expr="helpcounter+1"/>
  <if cond="helpcounter == 1">

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<audio src="z-mainhelp1.au">
  <break msec="150"/>Please say the name of a planet. <break msec="2000"/>
  Select Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto.
</audio>
</if>
<if cond="helpcounter == 2">
  <audio src="z-anytime.au">
    <break msec="150"/>At any time you can say Help, Repeat, Go Back, Start Over, or Exit.
  </audio>
  <audio src="z-mainhelp2.au">
    To continue, say Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune,
    or Pluto.
  </audio>
  <assign name="helpcounter" expr="0"/>
</if>
</catch>
<grammar>
mercury | venus | earth | mars | jupiter |
saturn | uranus | neptune | pluto
</grammar>
<filled>
<assign name="document.planet" expr="planet"/>
<goto next="#lookupdata"/>
</filled>
</field>
</form>

<form id="playlandmark">
<block>
<audio src="triple.au"/>
<break msec="150"/>
<if cond="document.planet=='mercury'">
  <audio src="z-mercury.au">
  <break msec="150"/><value expr="document.planet"/>
  </audio>
</if>
<if cond="document.planet=='venus'">
  <audio src="z-venus.au">
  <break msec="150"/><value expr="document.planet"/>
  </audio>
</if>
<if cond="document.planet=='earth'">
  <audio src="z-earth.au">
  <break msec="150"/><value expr="document.planet"/>
  </audio>
</if>
<if cond="document.planet=='mars'">
  <audio src="z-mars.au">
  <break msec="150"/><value expr="document.planet"/>
  </audio>
</if>
<if cond="document.planet=='jupiter'">
  <audio src="z-jupiter.au">
  <break msec="150"/><value expr="document.planet"/>

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</audio>
</if>
<if cond="document.planet=='saturn'">
  <audio src="z-saturn.au">
  <break msec="150"/><value expr="document.planet"/>
</audio>
</if>
<if cond="document.planet=='uranus'">
  <audio src="z-uranus.au">
  <break msec="150"/><value expr="document.planet"/>
</audio>
</if>
<if cond="document.planet=='neptune'">
  <audio src="z-neptune.au">
  <break msec="150"/><value expr="document.planet"/>
</audio>
</if>
<if cond="document.planet=='pluto'">
  <audio src="z-pluto.au">
  <break msec="150"/><value expr="document.planet"/>
</audio>
</if>
<break msec="150"/>
<audio src="triple.au"/>
<goto next="#gettopic"/>
</block>
</form>

<form id='gettopic'>
<block>
<assign name="helpcounter" expr="0"/>
<assign name="document.goback" expr="helloworlds2"/>
<assign name="currentform" expr="gettopic"/>
</block>
<field name="topic">
<prompt>
<break msec="150"/>
<audio src="z-selectatopic.au">
  Select a topic.
  <break msec="3000"/>
</audio>
<audio src="z-list.au">
  Say Distance from Sun, <break msec="750"/> Orbital Period,
  <break msec="750"/> Temperature, <break msec="750"/> Size, <break msec="750"/>
  Atmospheric Composition, <break msec="750"/> Number of Moons, <break msec="750"/>
  or Tell Me Everything.
</audio>
</prompt>
<catch event="help noinput nomatch">
<assign name="helpcounter" expr="helpcounter+1"/>
<if cond="helpcounter == 1">
  <audio src="z-topichelp1.au">
    <break msec="150"/>Please say the topic you're interested in.
    Select Distance from Sun, Orbital Period, Temperature, Size, Atmospheric Composition,

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        Number of Moons, or Tell Me Everything.
    </audio>
</if>
<if cond="helpcounter == 2">
    <audio src="z-anytime.au">
        <break msec="150"/>At any time you can say Help, Repeat, Go Back, Start Over, or Exit.
    </audio>
    <audio src="z-topichelp2.au">
        To continue, say Distance from Sun, Orbital Period, Temperature, Size,
        Atmospheric Composition, Number of Moons, or Tell Me Everything.
    </audio>
    <assign name="helpcounter" expr="0"/>
</if>
</catch>
<grammar>
distance from sun {distance}| orbital period {orbit}| temperature | size |
atmospheric composition {atmosphere}| number of moons {moons}|
tell me everything {all} | no {goback} | that not right {goback}
</grammar>
<filled>
<assign name="document.topic" expr="topic"/>
<if cond="topic=='goback'">
<goto next="#helloworlds2"/>
</if>
<goto next="#lookupdata"/>
</filled>
</field>
</form>

<form id='lookupdata'>
<block>
<if cond="document.planet == 'mercury'">
<assign name="document.distance" expr="'58 million kilometers'"/>
<assign name="document.position" expr="'the closest planet to the sun'"/>
<assign name="document.orbit" expr="'88 days, which is the fastest in the solar system,'"/>
<assign name="document.temperature" expr="'440 degrees Celsius'"/>
<assign name="document.size" expr="'next to smallest'"/>
<assign name="document.atmosphere" expr="'98% helium, 2% hydrogen'"/>
<assign name="document.moons" expr="'no moons'"/>
</if>
<if cond="document.planet == 'venus'">
<assign name="document.distance" expr="'108 million kilometers'"/>
<assign name="document.position" expr="'the second planet from the sun'"/>
<assign name="document.orbit" expr="'224 days'"/>
<assign name="document.temperature" expr="'457 degrees Celsius, the hottest in the solar
system due to a runaway greenhouse effect'"/>
<assign name="document.size" expr="'sixth largest'"/>
<assign name="document.atmosphere" expr="'97% carbon dioxide, 3% nitrogen'"/>
<assign name="document.moons" expr="'no moons'"/>
</if>
<if cond="document.planet == 'earth'">
<assign name="document.distance" expr="'150 million kilometers'"/>
<assign name="document.position" expr="'the third planet from the sun'"/>
<assign name="document.orbit" expr="'365 days'"/>

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<assign name="document.temperature" expr="15 degrees Celsius"/>
<assign name="document.size" expr="fifth largest"/>
<assign name="document.atmosphere" expr="79% nitrogen, 21% oxygen"/>
<assign name="document.moons" expr="one moon"/>
</if>
<if cond="document.planet == 'mars'">
<assign name="document.distance" expr="228 million kilometers"/>
<assign name="document.position" expr="the fourth planet from the sun and the closest planet to
earth"/>
<assign name="document.orbit" expr="687 days"/>
<assign name="document.temperature" expr="negative 55 degrees Celsius"/>
<assign name="document.size" expr="seventh largest"/>
<assign name="document.atmosphere" expr="96% carbon dioxide, 3% nitrogen, 1% argon"/>
<assign name="document.moons" expr="two moons"/>
</if>
<if cond="document.planet == 'jupiter'">
<assign name="document.distance" expr="778 million kilometers"/>
<assign name="document.position" expr="the fifth planet from the sun"/>
<assign name="document.orbit" expr="12 years"/>
<assign name="document.temperature" expr="negative 153 degrees Celsius"/>
<assign name="document.size" expr="largest"/>
<assign name="document.atmosphere" expr="90% hydrogen, 10% helium"/>
<assign name="document.moons" expr="39 moons, the most of any planet in the solar system"/>
</if>
<if cond="document.planet == 'saturn'">
<assign name="document.distance" expr="1.4 billion, yes, thats billion with a b, kilometers"/>
<assign name="document.position" expr="the sixth planet from the sun"/>
<assign name="document.orbit" expr="29 and a half years"/>
<assign name="document.temperature" expr="negative 185 degrees Celsius"/>
<assign name="document.size" expr="next to largest"/>
<assign name="document.atmosphere" expr="75% hydrogen, 25% helium"/>
<assign name="document.moons" expr="30 moons"/>
</if>
<if cond="document.planet == 'uranus'">
<assign name="document.distance" expr="2.9 billion, yes, thats billion with a b, kilometers"/>
<assign name="document.position" expr="the seventh planet from the sun"/>
<assign name="document.orbit" expr="84 years"/>
<assign name="document.temperature" expr="negative 215 degrees Celsius"/>
<assign name="document.size" expr="third largest"/>
<assign name="document.atmosphere" expr="83% hydrogen, 15% helium, 2% methane"/>
<assign name="document.moons" expr="21 moons"/>
</if>
<if cond="document.planet == 'neptune'">
<assign name="document.distance" expr="4.5 billion, yes, thats billion with a b, kilometers"/>
<assign name="document.position" expr="usually the eighth planet from the sun"/>
<assign name="document.orbit" expr="165 years"/>
<assign name="document.temperature" expr="negative 225 degrees Celsius"/>
<assign name="document.size" expr="fourth largest"/>
<assign name="document.atmosphere" expr="85% hydrogen, 13% helium, 2% methane"/>
<assign name="document.moons" expr="eight moons"/>
</if>
<if cond="document.planet == 'pluto'">
<assign name="document.distance" expr="5.9 billion, yes, thats billion with a b, kilometers"/>
<assign name="document.position" expr="usually the farthest planet from the sun"/>

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<assign name="document.orbit" expr="248 and a half years, the longest of any planet, ""/>
<assign name="document.temperature" expr="negative 233 degrees Celsius, only 40
degrees above absolute zero, making it the coldest in the solar system""/>
<assign name="document.size" expr="smallest""/>
<assign name="document.atmosphere" expr="mostly nitrogen, with some carbon monoxide and
methane""/>
<assign name="document.moons" expr="one moon""/>
</if>
<goto next="#playit"/>
</block>
</form>

<form id='playit'>
<block>
<if cond="document.topic == 'distance'">
At an average distance of <value expr="document.distance"/>,
<value expr="document.planet"/> is <value expr="document.position"/>.
</if>
<if cond="document.topic == 'orbit'">
It takes <value expr="document.planet"/> <value expr="document.orbit"/> to orbit the sun.
</if>
<if cond="document.topic == 'temperature'">
The average surface temperature of <value expr="document.planet"/> is
<value expr="document.temperature"/>.
</if>
<if cond="document.topic == 'size'">
<value expr="document.planet"/> is the <value expr="document.size"/> planet.
</if>
<if cond="document.topic == 'atmosphere'">
The atmosphere of <value expr="document.planet"/> contains <value expr="document.atmosphere"/>.
</if>
<if cond="document.topic == 'moons'">
<value expr="document.planet"/> has <value expr="document.moons"/>.
</if>
<if cond="document.topic == 'all'">
At an average distance of <value expr="document.distance"/>,
<value expr="document.planet"/> is <value expr="document.position"/>,
taking <value expr="document.orbit"/> to complete its orbit.
It has an average surface temperature of <value expr="document.temperature"/>.
The atmosphere is <value expr="document.atmosphere"/>. <value expr="document.planet"/> is
the <value expr="document.size"/> planet, and has <value expr="document.moons"/>.
</if>
<goto next="#helloworlds2"/>
</block>
</form>

<form id='goback'>
<block>
<goto expr="#" + document.goback"/>
</block>
</form>

<form id='confirmexit'>
<field name="exitChoice" type="boolean">

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<prompt>
<break msec="150"/>
<audio src="z-end.au">
Do you want to end this call?
</audio>
</prompt>
<catch event="help noinput nomatch">
<assign name="helpcounter" expr="helpcounter+1"/>
<if cond="helpcounter == 1">
<audio src="z-yesnorepeat.au">
<break msec="150"/>Please say Yes, No, or Repeat.
</audio>
</if>
<if cond="helpcounter == 2">
<audio src="z-anytime.au">
<break msec="150"/>At any time you can say Help, Repeat, Go Back, Start Over, or Exit.
</audio>
<audio src="z-exithelp2.au">
To end the call, say Yes. To return to Hello Worlds, say No.
</audio>
<assign name="helpcounter" expr="0"/>
</if>
</catch>
<filled>
<if cond="exitChoice">
<goto next="#exit"/>
<else/>
<audio src="triple.au"/>
<break msec="150"/>
<audio src="z-returning.au">
Returning.
</audio>
<goto expr="#" + document.currentform"/>
</if>
</filled>
</field>
</form>

<form id='exit'>
<block>
<break msec="150"/>
<audio src="z-bye.au">
Thanks for calling Hello Worlds. Goodbye!
</audio>
<exit/>
</block>
</form>

</vxml>

```