This code exercise is based on some of the concepts of old school text adventure games.

In this exercise you are supplied with two files. The first is an XML document (with inline DTD) that describes an adventure game map. It will look something like this:

**<map>**

**<room id="1" name="Hallway" north="2" />**

**<room id="2" name="Dining Room" south="1" west="3" east="4"/>**

**<room id="3" name="Kitchen" east="2">**

**<object name="Knife"/>**

**</room>**

**<room id="4" name="Sun Room" west="2">**

**<object name="Potted Plant"/>**

**</room>**

**</map>**

As you can see, a room may or may not permit travel in one of the four cardinal directions and may or may not contain "objects". The second file is a plain text file where the first line indicates the ID of the room the player starts in, and each subsequent line lists the name of an object they must collect. This file will look something like this:

**2**

**Potted Plant**

**Knife**

The objective is to write a program that will:

* \* Parse the XML and create a model of the map
* \* Read the plain text file, noting which room to start in and which items must be collected
* \* Output a valid route one could take to collect all the items specified in the text file

Given the above example the following is (one of the potentially) correct outputs:

**In the Hallway**

**I go north**

**In the Dining Room**

**I go east**

**In the Kitchen**

**I collect the knife**

**I go west**

**In the Dining Room**

**I go west**

**In the Sun Room**

**I collect the Potted Plant**

Make sure you pay attention to whether your moves are actually valid in the context of what is described in the map.xml file.

The actual input files for this exercise are also in the shared folder in which you found this document.

**map.xml**

<?xml version="1.0"?>

<!DOCTYPE map

[

   <!ELEMENT map (room\*)>

   <!ELEMENT room (object\*)>

   <!ATTLIST room id       ID      #REQUIRED>

   <!ATTLIST room name     CDATA   #REQUIRED>

   <!ATTLIST room north    IDREF   #IMPLIED>

   <!ATTLIST room south    IDREF   #IMPLIED>

   <!ATTLIST room east     IDREF   #IMPLIED>

   <!ATTLIST room west     IDREF   #IMPLIED>

   <!ELEMENT object (#PCDATA)>

   <!ATTLIST object name ID #REQUIRED>

]>

<map>

   <room id="pond" name="Pond" east="dirt-track">

       <object name="Fishing-rod"/>

   </room>

   <room id="dirt-track" name="Dirt Track" west="pond" east="mesa" south="front-yard"/>

   <room id="mesa" name="Mesa" west="dirt-track" east="foothills"/>

   <room id="foothills" name="Foothills" west="mesa" south="pine-forest"/>

   <room id="porch" name="Porch" south="hallway" east="front-yard"/>

   <room id="front-yard" name="Front Yard" west="porch" north="dirt-track" />

   <room id="scree-slope" name="Scree Slope" south="cave-entrance" east="pine-forest" />

   <room id="pine-forest" name="Pine Forest" north="foothills" west="scree-slope">

       <object name="Pine-cone"/>

   </room>

   <room id="hallway" name="Hallway" north="porch" east="front-yard" south="dining-room" />

   <room id="library" name="Library" west="hallway" south="secret-passage-west">

       <object name="Book"/>

   </room>

   <room id="cave-entrance" name="Cave Entrance" north="scree-slope" south="secret-passage-east" east="low-tunnel" />

   <room id="low-tunnel" name="Low Tunnel" west="cave-entrance">

       <object name="Pickaxe"/>

   </room>

   <room id="dining-room" name="Dining Room" north="hallway" south="kitchen">

       <object name="Plate"/>

   </room>

   <room id="secret-passage-west" name="Secret Passage (West)" north="library" south="scullery" east="secret-passage-east" />

   <room id="secret-passage-east" name="Secret Passage (East)" north="cave-entrance" south="huge-cavern" west="secret-passage-west" />

   <room id="underground-lake" name="Underground Lake" south="narrow-crawl">

       <object name="Lamp"/>

   </room>

   <room id="kitchen" name="Kitchen" north="dining-room" east="scullery" />

   <room id="scullery" name="Scullery" north="secret-passage-west" west="kitchen" />

   <room id="huge-cavern" name="Huge Cavern" north="secret-passage-east" east="narrow-crawl" />

   <room id="narrow-crawl" name="Narrow Crawl" north="underground-lake"/>

</map>

**scenario-1**

scullery

Plate

Fishing-Rod

Lamp

Book

Pickaxe

Pine-cone