Programming with Alice

Week 5 Lists and Arrays

Objectives

- Store and manage objects in linear data structures called lists and arrays
- Compare and contrast lists and arrays
- Use the For all together and For all in order statements
- Change the contents of lists dynamically using built-in list methods
- Randomly choose an object in a list or array

Chapter 5 PowerPoint
Source Code for CH 5

5.1 Managing Multiple Objects

Colony of Penguins example – We’d like for the members of the colony to have the capacity to act in unison and to act individually. Our old Do together will be too tedious; For all together and For all in order will help us manage multiple objects.
5.2 Lists
SchoolOfFish
TryThis: 1–4

Built-in List Methods

<table>
<thead>
<tr>
<th>set value</th>
</tr>
</thead>
<tbody>
<tr>
<td>insert &lt;item&gt; at beginning of world.my.first.method.school</td>
</tr>
<tr>
<td>insert &lt;item&gt; at end of world.my.first.method.school</td>
</tr>
<tr>
<td>insert &lt;item&gt; at position &lt;index&gt; of world.my.first.method.school</td>
</tr>
<tr>
<td>remove item from beginning of world.my.first.method.school</td>
</tr>
<tr>
<td>remove item from end of world.my.first.method.school</td>
</tr>
<tr>
<td>remove item from position &lt;index&gt; of world.my.first.method.school</td>
</tr>
<tr>
<td>remove all items from world.my.first.method.school</td>
</tr>
</tbody>
</table>

List Functions

- first item from list
- last item from list
- random item from list
- ith item from list
- is list empty
- list contains
- size of list
- first index of
- last index of
5.3 Arrays
WackAMole
TryThis: 5–6

Two integer variables, index and previous are used to keep track of mole movements

<table>
<thead>
<tr>
<th>world.my first method</th>
</tr>
</thead>
<tbody>
<tr>
<td>world.my first method  No parameters</td>
</tr>
</tbody>
</table>

```
* moles = [mole, mole2, mole3, mole4, mole5, mole6, mole7, mole8]. index = 0. previous = 0

Wait 0.5 seconds

Item index from moles move up 0.5 meters duration 0.25 seconds more...

While true

Wait random number minimum 0.25 maximum 0.75 more...

previous set value to index more...

Index set value to random number minimum 0 maximum 7 more...

Do together

Item previous from moles move down 0.5 meters duration 0.25 seconds more...

Item index from moles move up 0.5 meters duration 0.25 seconds more...
```

5.4 More to Explore
Saving Objects
Opacity – making object disappear, fade away, or emerge into existence

Texture – adding character to your object