

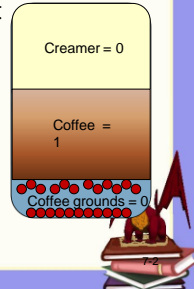
Lists/Arrays

Alice



Lists

- A data structure is a mechanism for storing data and organizing it
- A list is a container that hold groups of items
- Items may be added to the list or removed from it while the world is running



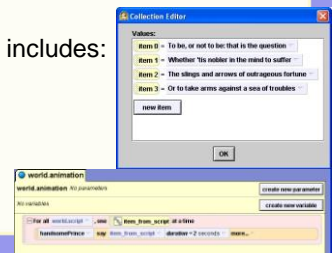
Lists

- Items are stored in a sequence
 - the first item is stored at position 0
 - the second item is stored at position 1
 - and so forth
- Position numbers are referred to as indexes
- Lists have a size...which is the number of items stored in the list



Storing Non-Visual Data in a List

- Non-Visual Data can be stored in lists
- This is NOT the same as storing an invisible object!
- Non-Visual Data includes:
 - numbers
 - strings
 - Boolean values



Arrays

1. Arrays are similar to lists
2. An array is a *container* that hold groups of items
 - The items are called *elements*
3. An array's size is fixed
 - Each element's position is numbered just like the list
 - Each position is referred to as *indexes*
4. Items may NOT be added to the list or removed from it while the world is running
 - Arrays can not use the same insert and remove methods that lists can use



Lists

LISTS

- A list is a container that hold groups of items
- 2. Items may be added to the list or removed from it while the world is running
- 3. Position numbers are referred to as *indexes*

ARRAYS

- An array is a container that hold groups of items
 - The items are called *elements*
- 2. An array's size is fixed... items may NOT be added or removed while the world is running
- 3. Each element's position is numbered just like the list...*indexes*

Arrays vs. Lists

- | | |
|---|--|
| 1. Array has fixed size | 1. Lists can be added and subtracted to |
| 2. When an object is "added" to an array, it replaces an object | 2. When an objects is "added" to an array, objects may shift position AND the list gets bigger |

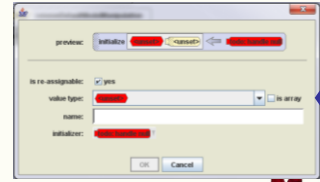
Arrays process faster!

Lists are more dynamic!



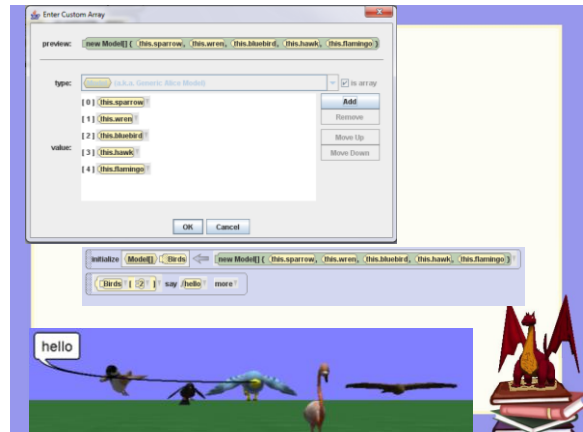
Creating an Array in Alice

- Created the same way that a List is created
- Use create new variable, but select Array instead



Working with Arrays

- Instructions can be used with Arrays much like they were with individual objects
 - Move, Turn, etc.
- Arrays use Loops rather than For all in order or For all together
 - With this example, the index variable increments by 1, so the first element moves, then the second element, etc.



Parameters

- Built-in methods provide flexibility by providing parameters such as distance and direction.
- Parameters allow you to pass in values (arguments).

Example

```
georgeBeetle.move up 0.5 meters duration = 0.5 seconds mi
```

Parameters: distance, direction
Arguments: 0.5 meters, 0.5 seconds



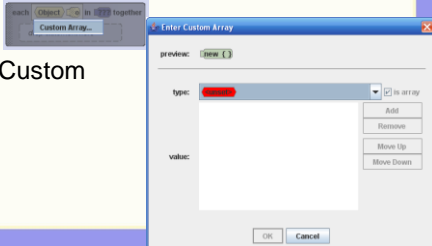
Kinds of Parameters

- Alice provides several kinds of parameters that can be used in your own methods.

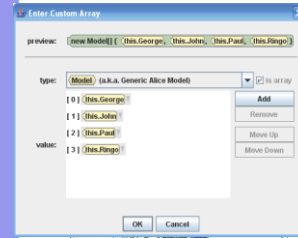


Creating an Array

- 1 Drag "each in [] together" to the methods editor
- 2 Select Custom Array



Creating an Array



NEW FORM OF INTERACTION..



Using the Let the mouse move <objects> Event

7.1

- 1 mouse move <objects> procedure allows the user to move objects by dragging them

