Note: Thanks to Wanda Dann and Steve Cooper for slide ideas
Announcements

• New pairs today
• Read Chapter 4, Section 2 for next time
• Assignment 3 storyboard due today
  – World is due Thursday
Review

- Fish circling around island

Show world

<table>
<thead>
<tr>
<th>fish</th>
<th>move forward</th>
<th>2.5 meters</th>
<th>more...</th>
</tr>
</thead>
<tbody>
<tr>
<td>fish</td>
<td>turn right</td>
<td>0.25 revolutions</td>
<td>more...</td>
</tr>
<tr>
<td>fish</td>
<td>move forward</td>
<td>10 meters</td>
<td>more...</td>
</tr>
<tr>
<td>fish</td>
<td>turn right</td>
<td>0.25 revolutions</td>
<td>more...</td>
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<td>more...</td>
</tr>
<tr>
<td>fish</td>
<td>turn right</td>
<td>0.25 revolutions</td>
<td>more...</td>
</tr>
<tr>
<td>fish</td>
<td>move forward</td>
<td>7.5 meters</td>
<td>more...</td>
</tr>
</tbody>
</table>

jagged                      smooth

fishturn right 1 revolution asSeenBy = island more...
What we will do today

• Lecture on Chap 4, Sec 1
• Classwork
  – Create two animations
    • Snowpeople mods including flipping hats
    • Helicopter
  – Get checked off today and for last time
Larger Programs

• Programs start to increase in size – many lines of code
• Games and “real world” applications have thousands, even millions of lines of code
• Want to organize large programs into small manageable pieces
Classes, Objects and Methods

• Object-oriented programming uses classes, objects and methods as basic components

• These components help you
  – Organize large program into small pieces
  – Design and think about an intricate program
  – Find and remove errors (bugs)
In your programs, you’ve used

• Classes
  – In Alice, classes are predefined as 3D models

• Objects
  – An object is an instance of a class
    • Class: Chicken
    • Objects: Chicken, Chicken2
In your programs, you’ve also used

• Built-in (predefined) methods
  – Examples: move, turn to face, say

• World.my first method
  – Example: snowpeople from chapter 2, wrote code where snowman tried to get attention of snowwoman
  – All the code in World.my first method
Modifying the Program

- Modify program to get snowman to try twice to get snowwoman’s attention twice
- To make modification, add more lines of code
  - makes the program code longer and more difficult to read and think about
- Show demo
A Solution

• A solution to the problem is to
  – Define our own method
  – Name the new method `catchAttention`

• Then, can drag-and-drop the `catchAttention` method into the edit box, just like the built-in methods
Demo: The Solution

- First associate new method with the world
- Select World tile
- Select methods tab
- Click on “create new method”
- Demo
World-level method

- catchAttention is a world-level method because it
  - Is defined as a method for World
  - Has instructions that involve more than one object (snowman, snowwoman, camera)
Using the `catchAttention` method

- This method is executed by calling (invoking) the method from my first method.

- For testing, invoke temporarily when world starts.
Why write our own Methods?

• Saves time – can call method again and again without rewriting code
• Reduces code size – call method instead of rewriting same code
• Allows us to think at higher level
  – Think “catchAttention” instead of “turn head to face camera, say ahem…”
  – Technical term for “think at a higher level” is abstraction
Classwork today

• Modify snowpeople to add two methods
  – catchAttention
  – fliphats

• Create airport/helicopter world with new method
  – circleTower