Notes 20: UML for Game Design.

We could spend the entire quarter just on UML and OO analysis and design. This is intended only as a very brief intro. I have chosen just enough to give you a flavor of UML and OO analysis and design. For more info check out:


Class Diagrams

<table>
<thead>
<tr>
<th>Class Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Members</td>
</tr>
<tr>
<td>Methods/services</td>
</tr>
</tbody>
</table>

The three areas get filled in with just enough info to concisely describe the class. There are different levels of Class diagrams:

Examples:

<table>
<thead>
<tr>
<th>BouncingBall_MovingMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>_x: Number             // x-coordinate</td>
</tr>
<tr>
<td>_y: Number             // y-coordinate</td>
</tr>
<tr>
<td>xv: Number             // x velocity</td>
</tr>
<tr>
<td>yv: Number             // y velocity</td>
</tr>
<tr>
<td>image: MovieClip       // library name of MC</td>
</tr>
<tr>
<td>width, height</td>
</tr>
<tr>
<td>depth: Number          // depth level</td>
</tr>
</tbody>
</table>
The above examples give enough info to have a good idea how to implement. OO Modelers really recommend three levels of modeling:

1) Conceptual  
2) Specification (interface level)  
3) Implementation (full data types, constructors, members, etc)

I like to do conceptual design with details that are not obvious to me thrown in. Classes also have associations with other classes.
How to Come Up With Initial Needed Classes:

1) Using “Things”
   - Identify individual or groups of things
   - Identify corresponding object

2) Pure Intuition

3) Using Nouns and Verbs
   Nouns become classes and members, verbs become methods (services)

Example:

4) Model after previous approach (Design Patterns, past work)
   - Event Handlers:
     i. Mouse Listener
     ii. Keyboard Listener
     iii. OnEnterFrame
   - Keeping track of State:
     i. Scoring object
     ii. Timer object
     iii. Level/sprite counters
   - Implementation Details:
     i. Assets: which movie clips/graphics needed
     ii. Arrays?
     iii. Linked Lists?
     iv. Sounds?
Sequence Diagrams

Exercise 1:

Add in the mouse handler, keyboard handler, score manager, and sprite counters to the above Class Diagram?

Exercise 2:

In a group of 2 or 3, decide on a classic arcade game to design. Write a textual description of the game. Use this description to come up with an initial class diagram. Create an object diagram by using post-it notes to create instances of your objects. Move the objects around in to create scenarios that the objects need to interact. Write down sequence diagrams for these interactions. Does this modify your design? If so, modify your design.