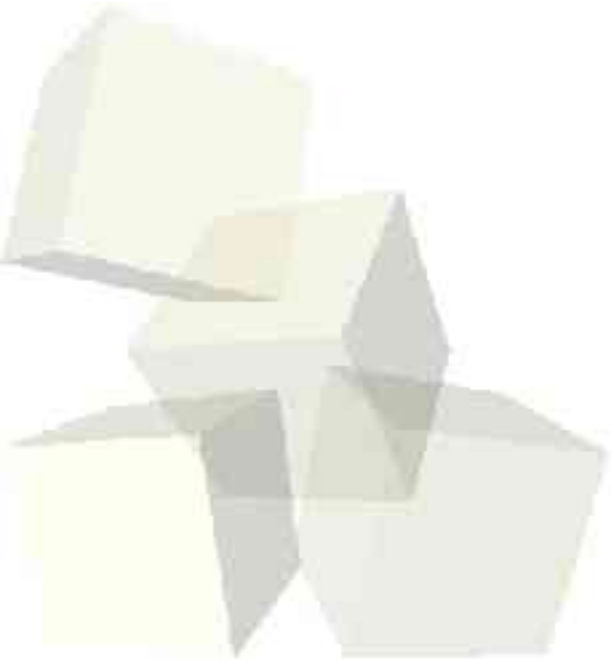
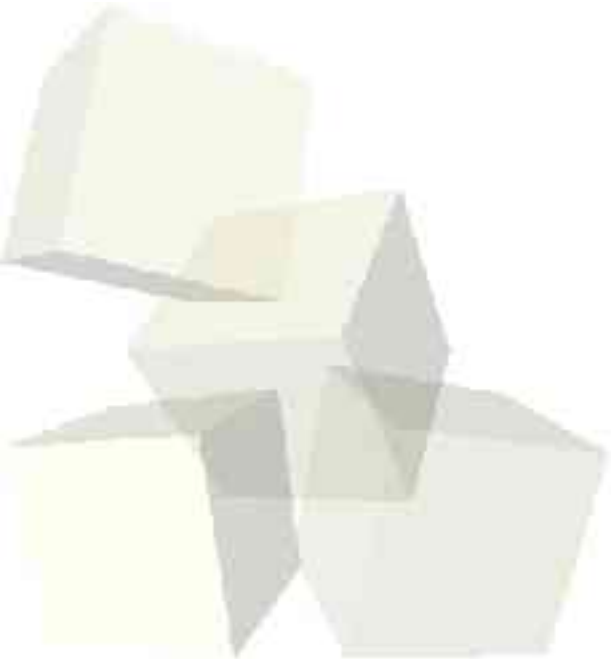
Conceptual Models

1-27-2004



Opening Discussion

- What did we talk about last class?
- The description of the first assignment has been posted. Let's go look at it.



Conceptual Models

- The idea of a conceptual model is that it should be easily understood, but it is not formal. The lack of formality means that it doesn't directly produce a simulation.
- We only spend one day on this chapter because what is covered here is very basic and I would hope that parts of it are almost second nature to you at this point.

Text Descriptions

- The simplest type of conceptual model is a basic prose description of the system. Such a description will typically do more than just tell us what we are simulating, it should also inform us to some extent about the level of detail of the simulation.

Conversion to OO

- Your book spends a fair bit of time talking about how to convert a written conceptual description into a class hierarchy in an object-oriented language. I'm not going to spent much time on this for two reasons.
  - I don't think you should need it. Everyone in here has spent a fair bit of time working with object-orientation and much of it should be second nature.
  - The way they present it seemed good in 1995, but it lacks depth for current ideas on OO. Classes aren't always nouns.

Pictorial Descriptions

- A picture can be worth a thousand words. In a conceptual model it should be worth at least a few paragraphs.
- Conceptual models are meant to communicate ideas and pictures can do a very good job of that. A simple stick figure drawing can display a lot of things that are hard to get across in words. Of course, such drawings are also often ambiguous and lack the rigor to produce a simulation directly from them.

Concept Graphs

- A slightly more defined type of conceptual model that we can draw is a concept graph.
- Like any graph, these graphs have vertices/nodes that are connected by edges. In a concept graph, the nodes are typically labeled as nouns and the edges are labeled as the action or relationship between them.
- For example, if we had a simulation that included a red car the concept graph might indicate this by having nodes for car and red with an edge that points from car to red labeled color_of.

Schematics

- A schematic diagram is a conceptual model that includes the full details of what is happening because it has a rules that fully qualify what different components mean.
- We won't be dealing much with schematics in this course, but things like circuit diagrams would be examples of them.

Class Hierarchies

- UML diagrams are effectively conceptual diagrams, only they have a closer link to the code than to the simulation system.
- Class diagrams can be used to display the major actors in the simulation and some of the relationships between them.
- Sequence diagrams, action diagrams, and object diagrams can be used to show specifically how aspects of the simulation work together.

Minute Essay

- Provide both textual and pictorial models of the office space event that will be held on Friday afternoon.
- Remember that assignment #1 is due on Tuesday.