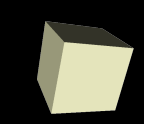
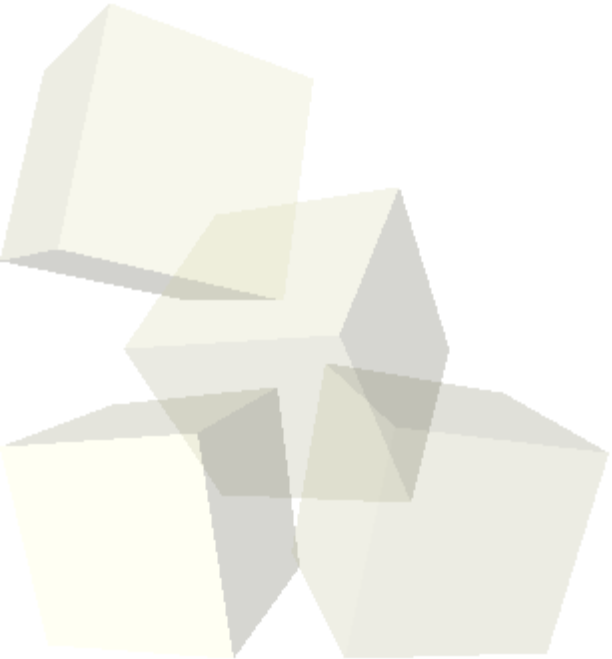


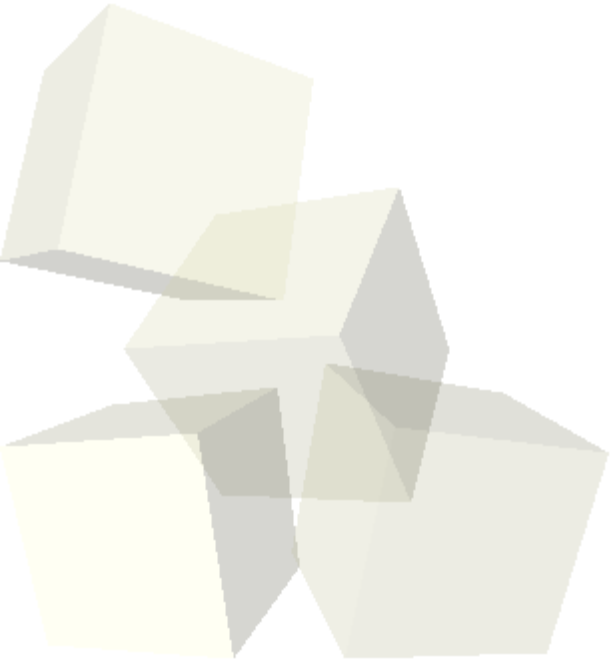
Syntax and Structure of Java

2/27/2008



Opening Discussion

- Let's look at some solutions to the interclass problem.
- Do you have any questions about the project?



Endless Possibilities

- Early in the course I stressed how I wanted to feature creativity. Alice was good tool to let you create interesting things quickly early on. Fundamentally it lacks power though.
- Java provides a basically unlimited scope for creativity. It is limited only by your motivation.
- I'd like to show you two projects that I've written in Java.
  - The program you will use for submitting your assignments. This is short and sweet, but does something that we really need.
  - A data plotting/analysis package that I've worked on for a while called SwiftVis.

Documentation/APIs

- There are basically two parts to any significant programming language: the language itself and the libraries for it.
- The language describes the syntax and semantics of how you give instructions in your program. The library is a collection of code written by others that you can call on to help you do things.
- Java has a fairly simple language, but very extensive libraries. We'll be covering the language in detail over the rest of the semester. We'll also see some parts of the libraries.
- You can (and should) look at the API on-line to see the possibilities in the libraries.

Structure of a Java Program

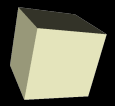
- Now that you know where to look for libraries, let's look at the language. We can do this by going back and looking at the interclass problem some.
- A class contains methods, data members, and potentially other classes.
- Inside a method we put statements. Basic statements end with semicolons.
  - Variable declarations have type, variable name, and potentially initialization.
  - Assignment statements have variable=expression.
  - Method calls are also allowed as statements.
  - We'll learn later about control flow statements.
- Expressions have a type and a value.

Comments in Java

- Just like in Alice, you can put comments in Java. They are probably more common in Java than in Alice.
- Single line comments can be added with //.
- Multiline comments can be added with /* and */.
- A comment that starts with /** is interpreted as being a special Javadoc comment. I'm not going to force you to learn how to do Javadoc comments, but they are what was used to create the API.

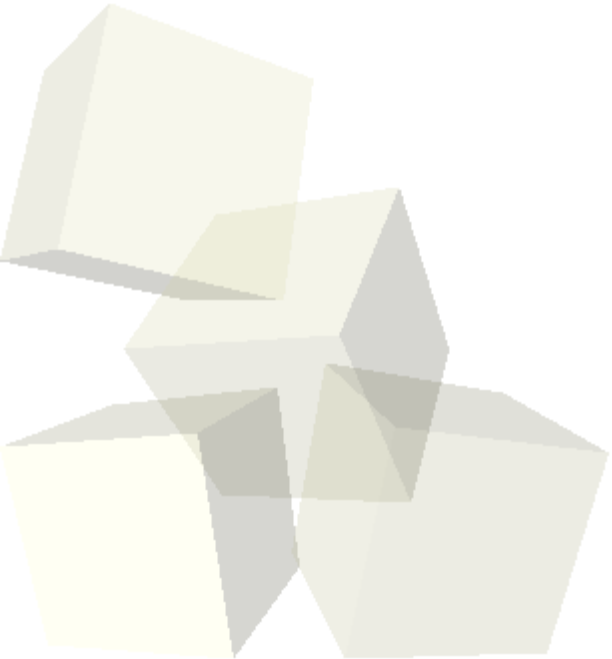
Import Statements

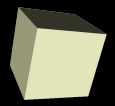
- Java code, including libraries are arranged into packages.
- Your code only sees the package it is in and java.lang. Other classes must b fully specified or imported. The import statement tells the Java compiler to look in a different location if it can't find something.
- Eclipse can add import statements for you through the Ctrl-Alt-M or Ctrl-Alt-O keystrokes.



Text Output in Java

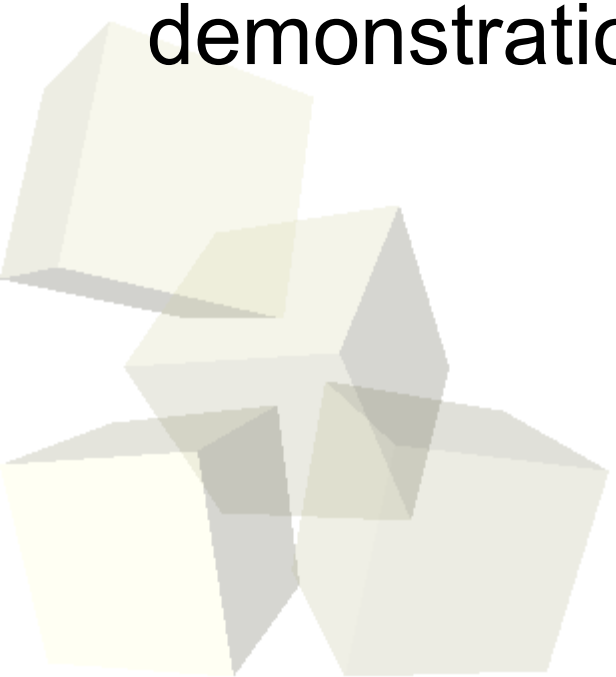
- We saw last time that we can use System.out.println() to print things.
- Your book likes System.out.printf(), but you won't see me use that much.
- Let's look in the API to see what System.out really is and what all we can do with it.
- Now let's write a bit of code to print some things.





Text Input in Java

- The easiest way to do text input in Java is with the Scanner class. Technically this is java.util.Scanner so we will normally have an input statement.
- Let's look at this in the API as well.
- Now I'm going to write some code that uses both a Scanner and prints output. It might not all make sense at this point, but I want to do it for demonstration purposes.



Minute Essay

- What similarities do you see between Java and Alice? What things are different?
- Remember that the project is due Friday.
- Interclass Problem – Write code that uses input and output in Java, but isn't right from your book.