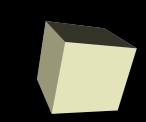
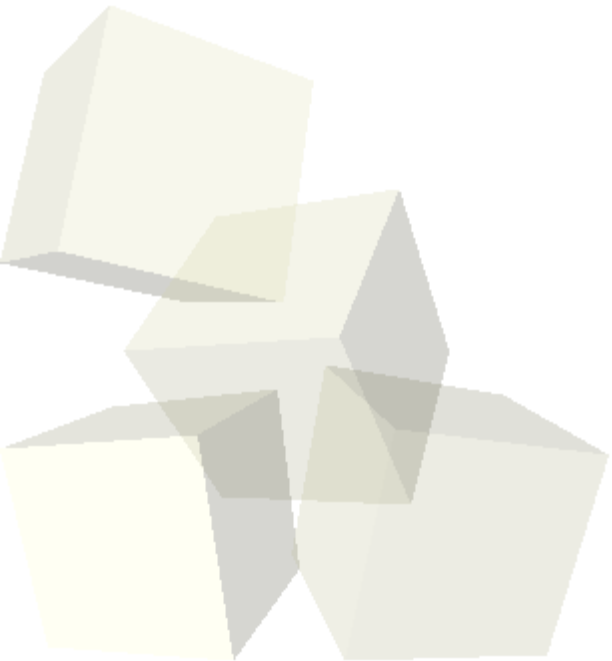


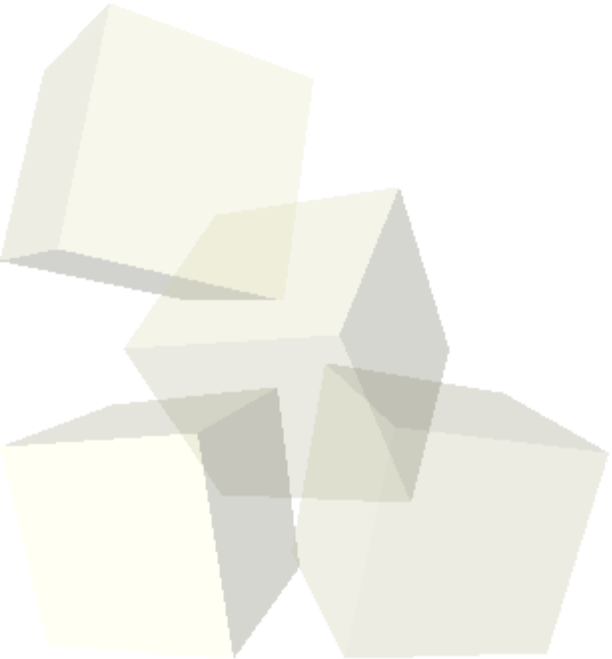
Boolean Expressions and if

9-14-2006



Opening Discussion

- Do you have any questions about the quiz?
- What did we talk about last class? What code did we write last class? What problems did we run into with that code?
- Do you have any questions about the reading?



if Statement

- Last time we ran into a situation where we wanted to do one thing if a variable was positive and something else if it was negative. Let's go look at that code.
- The way we typically deal with situations like this in C is to use an if statement.
- What does an if statement look like in C? How can we use them?
- Let's add the proper if statement to the code in our program.

Boolean Expressions

- The expression in an if statement is interpreted as a boolean expression. This is an expression that has only one of two values, true or false.
- In C99 we could use a variable of type bool in a boolean. In C90 you can use any numeric value and 0 will be taken as false while any other value will be true.
- Most of the time though we want to use real boolean expressions. These require operators that return true or false depending on their arguments.

Simple Boolean Expressions

- We can make simple boolean expressions by comparing expressions of other types. We do this with the following comparison operators.
  - == tests equality
  - != tests inequality
  - <, > are less than and greater than
  - <=, >= are greater than or equal to and less than or equal to
- The results of these on numeric types should be clear. For character types what is compared is the ASCII value of the character.

Boolean Operators

- We can combine boolean expressions into more complex boolean expressions using boolean operators.
- What are the meanings of the following boolean operators?
  - &&
  - ||
  - !
- What are the precedence of these operators?
- When would you use these? Let's put a bit more logic into our program so we can see the use of this.

Conditional Expression

- The problem with an if statement is that it doesn't have a value. As a result, some things are easier to do with the conditional expression in C. This has the form (expr)?(true val):(false val).
- You probably shouldn't use this too much in your programming as it isn't widely used and might confuse some people.
- It is standard in C and all the C-family languages so you should know it and use it when it significantly simplifies your code.
- Could we have used this in our code? Would it have been beneficial?

Minute Essay

- If you do your own taxes you probably realize that the tax code includes some significant boolean logic. Assuming appropriate variables, write the boolean expression you would use for a situation where someone must be under 25 and have a gross income between $20,000 and $50,000.