9/26/2007
Opening Discussion

- Do you have any questions about the quiz?
- Let's look at some solutions to the interclass problem.
When there is something wrong with a program we call it a bug. This is for historical reasons even though modern bugs are caused by the programmer, not chance.

There are three levels of bugs:
- Syntax errors – The simplest to fix. The compiler helps you.
- Runtime errors – Code compiles, but crashes when you run it. Tools can help you find the point where it crashes.
- Logic errors – Code compiles and runs, but gives you the wrong error. Hardest to find of the errors.
The compiler helps you with syntax errors, but you need a different tool to help you with runtime and logic errors.

Printing extra debug statements is the most general technique, but it is often faster to use a tool called a debugger.

On this system we have a debugger called gbd. If you compile your program with the -g option you can run your program in gdb and get extra information.

gdb has built in help, but to get you started use run to start the program, where to see a stack trace, and print to see variable values.
One of the more unusual operators in C is the comma operator.

It is the lowest priority operator and is just used to separate other expressions.

It has the value of the expression on the right side. So the left side has to have a side effect in order to do anything.

You will probably never see the comma operator used outside of a for loop even though to do so is legal.

Using commas in the wrong place in C can lead to very odd errors.
The Power of Recursion

■ We already saw how we can get repetition through recursion. Of course, C has loops for doing repetition and you should generally use them for basic repetition.

■ The real power of recursion comes from the fact that the stack remembers things for you. A loop doesn't.

■ This also allows recursive methods to call themselves more than once. A recursive method that calls itself more than once generally requires some thought to convert to a loop.

■ Let's see how we can use the memory of the stack.
Why are logic errors so much harder to find than syntax or runtime errors?
Remember that assignment #3 is due Friday at midnight.
Interclass Problem – Do either problem 49 or 50 on page 385.