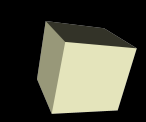
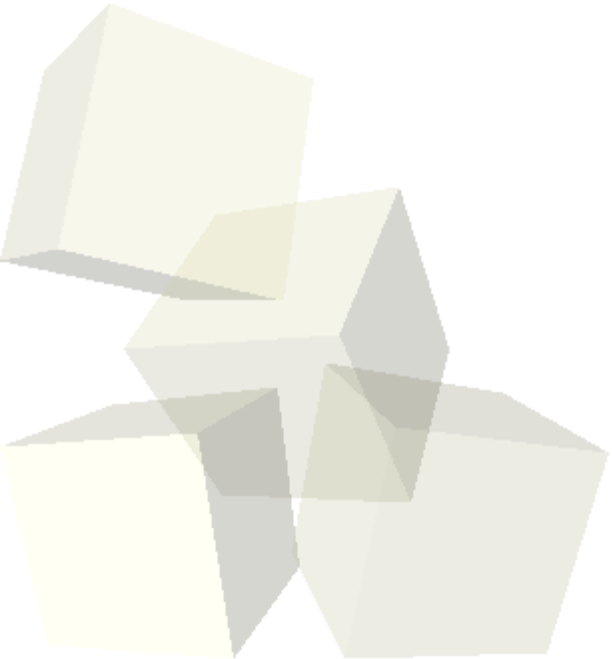


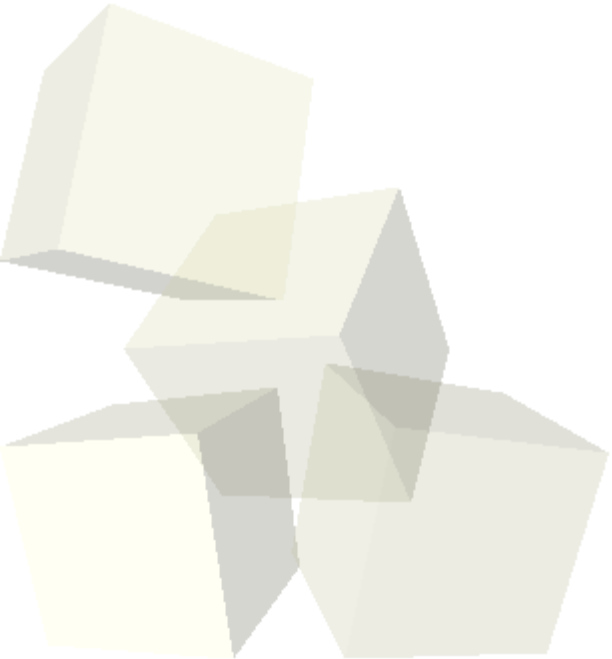
Unions and More Recursion

11-14-2006



Opening Discussion

- Do you have any questions about the quiz?
- What are some user defined types you can create in C? When would you use them?
- Do you have any questions about the assignment?
- Minute essay on representing some geometry.

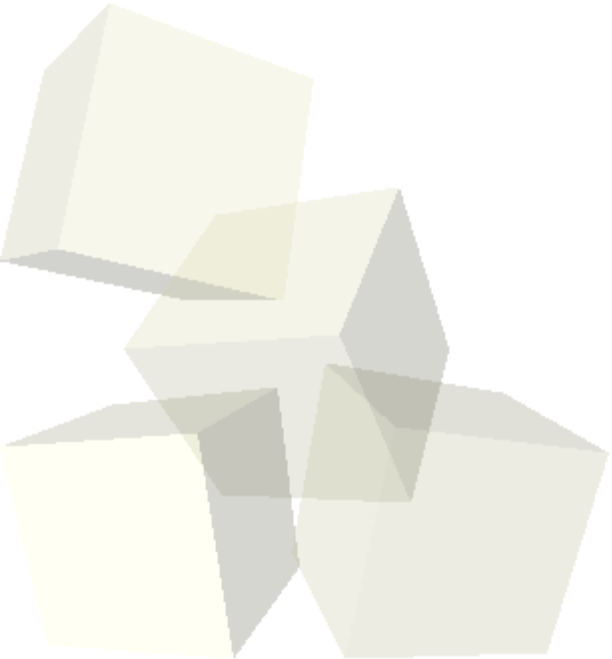


Structures with Pointers

- Structures are a nice way to keep things organized and you can put any type you want inside a structure.
- We've seen arrays and even other structures inside of a structure. What happens when you put a pointer in a structure? Why would you want to do that?
- What are some of the issues with doing this?

Assignment of Structures

- You know what happens if you do a=b when a and b are standard types. What happens if a and b are structures?
- What are some things that might happen to make this process more interesting?

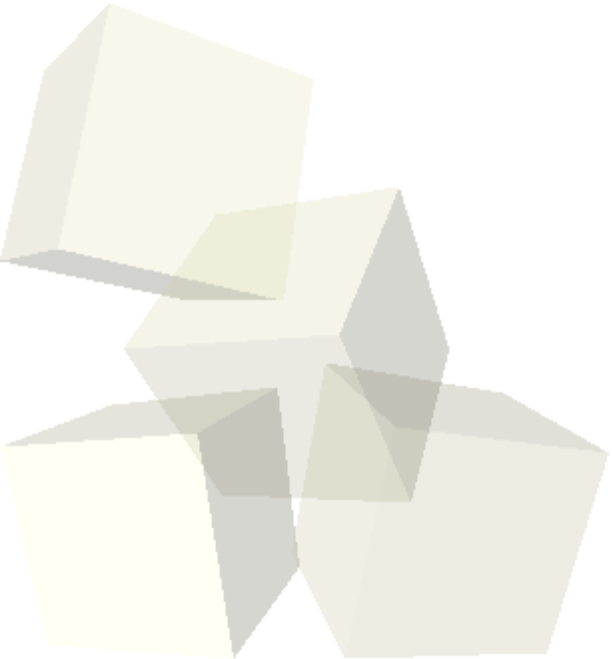


Unions

- A structure is a user defined type that has all of the fields at once. You can think of it as having field_1 and field_2 and ...
- A union is a user defined type that should only be used as one of several possible types. The union will get enough memory for the largest option, but if you store one option in it, you shouldn't try to read out another one.
- This is C's way of doing a polymorphic type, one type that can represent many possibilities.
- Most of the time you will hide a union inside a structure. The reason is that you need to have a value (often an enum) that tells you which option in the union you are using. Lack type safety.

Optimizing Recursion

- Let's go back to our maze solver and try to figure out a way to make it more efficient.
- It turns out that while recursion is very powerful, in some problems it winds up repeating a lot of work.
- If we view the recursive calls as branches of a tree, our optimization methods attempt to prune off parts of that tree.
- As time permits let's write a different recursive problem that can be nicely optimized. In this case I want to do something called memoization to optimize the recursion.

Minute Essay

- What is the primary problem with using unions in C?
- Remember that assignment #8 is due on Thursday.