Arrays: Part 3

10-21-2002

Opening Discussion

- What did we talk about last class?
- Do you have questions about the 5th assignment?
- How do we go through and do something with the characters in a string?
- Converting a string to upper case.
- ASCII values and character literals.
- -> in C.

Basic String Functions

- There are some operations that are very handy to be able to do with strings.
  - length: we like to be able to find the length of a string.
  - compare: checks if two string are equal.
  - copy: it is helpful to be able to copy a string.
  - concatenate: appends one string to another.
- Let's write one or two of these.

Multidimensional Arrays

- It is possible in C to have arrays of more than one dimension. The way we do this is by having arrays of arrays. In many ways they are similar to pointers to pointers.

```
int a[10][20];
int j,k;
for(j=0; j<10; j++)
     for(k=0; k<20; k++)
          a[j][k]=0.0;
```

Passing Multidimensional Arrays

- When we pass multidimensional arrays to functions we have to specify the size of every subscript beyond the first one. This is a significant pain and oddly I can't find a way to avoid it under the newer compilers. When we talk about dynamic memory we'll fix this problem.

```
void foo(int a[][20]);
```

Multidimensional Arrays as Pointers

- Multidimensional arrays are represented as arrays of pointers to array or pointers to pointers. Let's draw this.
- This has the implication that they don't have to be rectangular.
- Testing with the new compilers indicates that this doesn't seem to be 100% true for arrays declared as local variables and put on the stack.

Code

- Now let's write a bit of code that works with some multidimensional arrays. Keep in mind that while we need one loop when playing with the elements of a 1-D array, we typically need n loops when playing with an n-D array.

Minute Essay

- Write a function that takes an int [][10], 2-D array and returns the value of the largest element in it.
- Make sure you are working on assignment #5. Remember that the programs get bigger and more complex over the course of the semester. Sit and think first and don't hesitate to ask me questions when they arise. Earlier is better.