Administrivia

- Grade summaries mailed yesterday. Do let me know if it seems I have made a mistake.

- Next homework on the Web. Due in a week.

- Quiz 4 next week. Likely topic is arrays.

Slide 1

Arrays — Review/Recap

- Arrays give you a way to do something akin to subscripted variables in math: You reserve space for a group of values of a particular type, giving a name, and then reference particular vaiues with that name and an *index* (like a math subscript).

- Valid indices range from 0 to one less than the array size. Alas, in C it's all too easy to use an index not in that range, and results are — unpredictable. (Your program might crash, or it might overwrite some other variable.) (Worth noting that more-modern programmming languages have safety checks to prevent this. C doesn't do that, for reasons its adherents think good.)

- (As one more example, we could write the program mentioned last time, the one that counts how many of each character in input.)

Slide 2

I/O Redirection Revisited — Pipes

Slide 3

- I talked briefly in class earlier in the semester about "I/O redirection" as a way to get program input from some source other than the keyboard, and to output to something other than the screen. At the time I mostly talked about using files as the input source or output destination.

- But in UNIXworld, programs can also get input, or write output, to "pipes" — i.e., you use the output of one program as input to another. Examples from class:

  `echo "aaaa bb cccc dd" | a.out` to run that character-counting program with a single line of input. (Why is this any better than letting the program prompt? well, you can repeat it more easily with the up arrow.)

  `a.out | less` to page through output of the first "floating point is strange" example.

Floating-Point Revisited

Slide 4

- One of the exam questions asked you about representing 0.1 in (binary) floating point. Only one person got it right. Why is the answer "can't be done exactly"?

- Well . . .

Numbers in Math Versus Numbers in Programming (Review)

- The integers and real numbers of the idealized world of math have some properties not completely shared by their computer representations.

- Math integers can be any size; computer integers can't.

Slide 5

- Math real numbers can be any size and precision; floating-point numbers can't. Also, some quantities that can be represented easily in decimal can't be represented in binary.

- Math operations on integers and reals have properties such as associativity that don't necessarily hold for the computer representations. (Yes, really!)

- (Two "floating point is strange" example programs.)

Minute Essay

- None really — sign in? unless you have questions?

Slide 6