

Recursion and Repetition

2-8-2012

Opening Discussion

- Minute essay comments:
 - Efficiency for 10,000 numbers.
 - Assignments vs. IcPs.
 - Programming concepts involved in video games.
 - Do I see danger in self-driving cars?
 - Picking up withdraw forms.

Motivation

- We have the ability to do things once and to control whether or not certain things happen that once.
- Computers are really great for doing things multiple times.
- Reading a whole file or doing something until the user tells us to stop.

Mathematical Recursion

- The idea of recursion comes from mathematics.
- A function is recursive if it is defined in terms of itself.
- All recursive functions will have at least two cases.
 - One where the function refers to itself.
 - A base case where it doesn't refer to itself.
- Let's look at some examples of this.

Programmatic Recursion

- Now I want us to write some Scala functions that are recursive.
- They will look much like the math functions.
- We have to provide a return type.
- One argument changes to tell us when to stop.

Scripts and Redirection

- One way to process data from a file is to write a script and use redirection.
 - `scala script.scala < input.txt`
- This way you don't have to enter the input over and over. Also handy if the input is really large.
- We'll learn other ways to deal with files later.

Averaging Numbers

- I have some large files of numbers in the in-class code directory.
- I want to use recursion and redirection to find the average of these.
- If time allows let's think of some other things we might want to do with them.

Minute Essay

- What questions do you have about this topic?
- We will do IcP #3 on Friday.