Recursion

11-21-2011

Opening Discussion

- Minute essay comments:
  - Getting recursion to be your friend.
  - Odds on IcPs.
  - Final exam. (9:30 section is noon on the 14th, 10:30 section is 8:30 on the 15th)
  - Closing sources.
  - Next IcP is showing your assignment.
  - Having things click.
  - Final is not explicitly cumulative.
  - I have no thoughts on Windows phones.

More

- Last assignment due during finals period. You can pick which chapter 16 project to do.
- You can “recreate your own project.”
- Animating towers of hanoi.
- My guess is that if SOPA had passed it would have been repealed shortly after.

Fibonacci Numbers

- The simplest example of a recursive function that calls itself more than once is the Fibonacci numbers.
  - 1, 1, 2, 3, 5, 8, 13, 21, ...
- Each number is the sum of the two before it.
  - f(n)=if(n>2) f(n-1)+f(n-2) else 1
- Simple, but not great.

Towers of Hanoi

- A classic example of recursion is solving the Towers of Hanoi.
- This game is generally made with disks and three pegs.
- You need to move the disks from one peg to another.
  - Can only move one disk at a time.
  - Can't place a disk on one smaller than it.
- Solution to N disks: move N-1 disks, move 1 disk, move N-1 disks.

Mazes

- My favorite example is mazes.
- Consider a maze as a 2-D grid with each square either filled or not.
- Now the challenge is to find the length of the shortest path through the maze.
- How do you do that?

Minute Essay

- What questions do you have about stuff?