CSCI 101 Thursday 12/7/17

Running times of algorithms:
Suppose algorithm is O(n), takes 3 seconds for n = 100.
   # sec for n=200? \[\rightarrow 3 \times 2 = 6 \text{ sec}\]
   # sec for n=700? \[\rightarrow 3 \times 7 = 21 \text{ sec}\]
   # sec for n=1000? \[\rightarrow 3 \times 10 = 30 \text{ sec}\]

Suppose algorithm is O(n^2), takes 5 seconds for n = 2000.
   # sec for n=4000? \[\rightarrow 5 \times (2^2) = 20 \text{ sec}\]
   # sec for n=14000? \[\rightarrow 5 \times (7^2) = 5 \times 49 = 245 \text{ sec}\]
   # sec for n=20000? \[\rightarrow 5 \times (10^2) = 500 \text{ sec}\]

Challenge: Suppose algorithm is O(2^n), takes 5 seconds for n = 10.
   # sec for n=11? \[\rightarrow 5 \times 2^1 = 10 \text{ sec}\]
   # sec for n=15? \[\rightarrow 5 \times 2^5 = 160 \text{ sec}\]
   # sec for n=20? \[\rightarrow 5 \times 2^{10} = 5120 \text{ sec}\]

Topics to explore:

Programming Languages
Java - Used for web applications. Object-oriented. (Used in CS 201)
C - Used for systems programming. Low-level, imperative. (Used in CS 202)
Javascript - Used to embed code in web pages.
Matlab - Used in matrix computations.
Haskell - Functional language.

Other languages: C++, Ruby, Scheme, Coffeeescript, Processing, R
Block-based languages: Scratch, Alice, App Inventor
Programming Environments: Dr Java, Eclipse, Blue J, Pencil Code, command line

Unix
Use of command line interface (google "Unix tutorial")

HTML / CSS
HTML tutorials (google "HTML tutorial", e.g., w3schools.com/html)
CSS tutorials (google "CSS tutorial", e.g., w3schools.com/css)