

CSCI 101 Thursday 5/10/18

Running times of algorithms:

Suppose algorithm is $O(n)$, takes 3 seconds for $n = 100$.

sec for $n=200$? $\rightarrow 3 * 2 = 6$ sec

sec for $n=700$? $\rightarrow 3 * 7 = 21$ sec

sec for $n=1000$? $\rightarrow 3 * 10 = 30$ sec

Suppose algorithm is $O(n^2)$, takes 5 seconds for $n = 2000$.

sec for $n=4000$? $\rightarrow 5 * (2^2) = 20$ sec

sec for $n=14000$? $\rightarrow 5 * (7^2) = 5*49 = 245$ sec

sec for $n=20000$? $\rightarrow 5 * (10^2) = 500$ sec

Challenge: Suppose algorithm is $O(2^n)$, takes 5 seconds for $n = 10$.

sec for $n=11$? $\rightarrow 5 \times 2^1 = 10$ sec

sec for $n=15$? $\rightarrow 5 \times 2^5 = 160$ sec

sec for $n=20$? $\rightarrow 5 \times 2^{10} = 5120$ 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, Coffeescript, 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)