Spring 2017

CS241 Data Structures and Algorithms - Topics

1. Data Structures

A. Lists
i. arrays
ii. lists of lists (e.g. 2-d arrays)
iii. `ArrayList<type>`
iv. stacks & queues

B. Trees
i. Binary trees
ii. Binary search trees
iii. Heaps
iv. nary trees
v. game trees and minimax

C. Tables
i. Hash tables, `HashMap<type>`
ii. look-up tables

D. Java interfaces
i. `Collection`
ii. `List`
iii. `Set`

2. Algorithms

A. Sorting
i. Ø(n) - oracle, table
ii. Ø(n log(n)) - merge, quick, heap, tree
iii. Ø(m log(n) -- radix
iv. $Ø(n^2)$ - bubble, insert, selection
v. $Ø(n^3)$ - usually due to a programmer error
vi. Ø(n!)! - random

B. Searching
i. linear
ii. binary
iii. look-up

C. Dynamic programming
i. Fibonacci
ii. Bioinformatics

3. Analysis of Algorithms

A. Definition of Ø

B. Best/worst/average case analysis

C. Counting cycles

D. Empirical verification