

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. n-ary 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. $O(n)$ - oracle, table
- ii. $O(mn)$ -- radix
- iii. $O(n \log(n))$ - merge, quick, heap, tree
- iv. $O(n^2)$ - bubble, insert, selection
- v. $O(n^3)$ - usually due to a programmer error
- vi. $O(n!)!$ - random

B. Searching

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

C. Dynamic programming

- i. Fibonacci
- ii. Bioinformatics

3. Analysis of Algorithms**A. Definition of O** **B. Best/worst/average case analysis****C. Counting cycles****D. Empirical verification**