

# Study guide for CS165 second midterm exam

By now, you should be able to interpret or write a Java program that uses any of the items shown below.

## 1) Review Topics

- a. Basic Programming
- b. Classes versus Objects
- c. Object Instantiation
- d. Abstract Classes and Interfaces
- e. Recursion
- f. Inheritance
- g. Polymorphism
- h. Dynamic binding

## 2) Data Structures

- a. Collections hierarchy
- b. Collection interface
- c. List interface
- d. Queue interface
- e. Stack interface
- f. ArrayList class
- g. LinkedList class
- h. Stack class
- i. Collections class
- j. Comparable interface
- k. Comparator interface
- l. Iterators
- m. ArrayList implementation
- n. LinkedList implementation

## 3) Priority Queues, Heaps

- a. Offer/add
- b. Complete binary tree
- c. Array storage
- d. maxHeap, minHeap
- e. Insert/delete
- f. HeapSort

## 4) Grammars, Expressions, Parsing

- a. Grammars / Production Rules
- b. Regular Expressions
- c. Infix, Prefix, Postfix,
- d. Expression Trees
- e. Expression Evaluation

## 5) Trees

- a. Binary Trees
- b. Binary Search Trees (BST)
  - ✓ Searching
  - ✓ Inserting / Delete
  - ✓ Inorder, Preorder, Postorder, LevelOrder Traversal
- c. B+ Trees
  - ✓ Advantages and Disadvantages
  - ✓ Structure
  - ✓ Insert / Delete
  - ✓ Rotation
  - ✓ Bulk loading