Topics

- Java and OOP
  - classes
  - static variables and methods vs. instances variables and methods
  - public and private
  - references vs. objects
- Inheritance
  - method overloading and overriding
  - variables of type T can refer to any object that is a subclass of T

Topics

- Queues and stacks
  - minimal set of operations
  - generic ADTs used in everyday life
  - different implementations possible
  - first introduction to interfaces
- Memory model
  - runtime stack, object space, static space
  - following local pointers and referencing the correct answer

- Linked data structures
  - a different use of references
  - linked list insert, delete
- interfaces, abstract classes and ADTs
  - Comparable, Iterator
  - difference between interface and abstract class
  - what is an ADT?
  - using interfaces to define an ADT

- Comments
  - general
  - preconditions
  - representation invariants
  - javadoc
- Exceptions
  - objects in Java
  - throws
  - throw, try, catch
- Trees
  - terminology
  - BST algorithms
- Recursion

- Proofs
  - Basic proof structures
  - Using induction to prove methods correct
- Complexity (Big O)
  - definition
  - Relationship between functions
  - How to analyze iterative code, and method calls.
- Merge Sort

About the Exam

- You may bring one 8.5x11 sheet, handwritten on both sides.
- Types of questions:
  - short answer: one word or a sentence or two
  - true/false (not too many)
  - Writing code
  - Tracing code (maybe with a memory model)
  - Writing a proof (or filling in a proof)
  - Designing a class or classes
  - Writing comments, preconditions, representation invariants, test cases

Exam strategy

- Studying:
  - practice rather than read
  - do old exams **without** looking at the solutions
  - go over assignments and labs
- Get a good night's sleep!!
- Arrive with a positive attitude

At the exam

- Dress in layers – exam rooms are often warm
- Bring water, or something to drink
- No cell phones, pagers, or other electronic devices will be allowed on your desk (or in your ears), so bring an old-fashioned watch.
- Check the number of questions and flip through the exam first.
- Start with an easy question.
- If you get stuck on a question move on.
- Read carefully!
- Time management is crucial!!