

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!!