Study guide for CS165 first midterm exam

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

1) Recursion
   a. Basic definition of recursion
   b. Calling a method from itself
   c. Stack model for recursion
   d. Helper methods
   e. Memoization
   f. Hanoi, PentagonPark
   g. Tail recursion

2) Classes & Objects
   a. Classes versus Objects
   b. Class variables (static)
   c. Instance variable (non-static)
   d. operator for data and method access
   e. Class and Instance methods
   f. Scoping of variables
   g. Instantiating an object from a class
   h. Class constructors
   i. Object references
   j. public versus private data and methods
   k. Getter and Setter methods
   l. Arrays / ArrayLists of objects
   m. this keyword

3) Inheritance
   a. Basic inheritance
   b. Super and Sub Classes
   c. extends keyword
   d. implements keyword
   e. super keyword
   f. Constructor chaining
   g. Overriding methods
   h. Overloading methods
   i. Polymorphism and casting
   j. Dynamic binding
   k. instanceof operator
   l. equals and toString methods
   m. Access modifiers: private, public, protected
   n. final keyword

4) Abstract Classes
   a. Abstract Methods vs. Concrete Methods (differences)
   b. Terminology
      ✓ Superclass versus Subclass
      ✓ Base class versus Derived class
      ✓ Parent class versus Child class
   c. Sharing code via abstract class
   d. Differentiating code via abstract class
   e. extends keyword
   f. super keyword

5) Interfaces
   a. Only contains abstract methods
   b. Cannot contain concrete methods
   c. implements keyword
   d. Methods only, no class or instance data
   e. Constants sometimes included
   f. Enumerations often included
   g. Signature: Pure functionality (no implementation).
   h. Arrays of interface types can store any class that implements
      the interface
   i. Comparable, Cloneable, List