# Midterm Review Sheet

This test will consist of 10 questions that are similar in many ways to the questions that you have had on the quizzes. There is also an extra credit question. You will have 50 minutes to complete the test. Generally the way I try to lie out tests they will have 4 short answer questions, 3 coding questions, and 3 tracing questions. It is possible that that format will change a bit because this class focuses more on object-oriented design and programming than basic problem solving. The test can include any material that we have covered in class so far though I'm not going to be putting GUIs on it. Below is a list of the general topics we have covered and some of the main points that I might expect you to know about them.

Object-Orientation
> Encapsulation.
> Separation of interface from implementation.
> Know what objects are and why we consider them useful.
> Know what you should do in code to use this model more effectively.

Classes
> You need to understand the basics of class based OOPLs.
> What is the function of a class? How does it differ from an object?
> Know what the different types of inner classes are and what they do.

UML
> Know the basics of class diagrams and be able to draw one.

Java Basics
> Understand the basic syntax and semantics of Java. You will have to write some code.
> Know how Java classes are laid out and the different things that you can put into them.
> What does import mean and do?
> Know the differences between primitives and objects.
> Understand the Java syntax, including method invocation.

Inheritance in Java
> What is inheritance? What roles can in play in a language?
> Why do we use inheritance?
> What are Interfaces in Java? How are they different from classes?
> Be able to describe the limitations on inheritance in Java.

Polymorphism
> How is polymorphism achieved in Java?
> What details of the language make this very usable in Java?
> Be able to write code that uses polymorphism or trace code that uses it.

String Processing
> Understand the Java String class and how to use it. This includes the fact that it is immutable.

Arrays
> Understand Java array objects and how to use them.
> Know what you need to do to create and use single and multidimensional arrays.
> Know how to sort the values in an array as well as how to search for values in arrays.

Stacks and Queues
> Understand the ADTs for stacks and queues.
> What if LIFO and what if FIFO? Which is what a stack does? What about a queue?
> Know how to implement both of these using arrays.

Linked Lists
> Understand what a linked list is.
> Be able to draw pictures showing basic manipulations on linked lists.
> Be able to write the code for the basic methods of a linked list.
> Understand the concepts of circular and doubly linked lists.