CSc 115 Spring 2014
Midterm Objectives

In order to successfully complete this midterm, you must be able to:

- Explain difference between primitive data types and references (to any object, including arrays), including the passing of each as parameters to and returning values from methods. Know how each are represented in memory. Know the scope of variables.
- Create and use arrays, including arrays of objects.
- Differentiate between instance methods vs. static methods—how are they different?
- Call instance methods, from within and from outside their class.
- Explain the purpose of an Abstract Data Type in a large programming project
- Describe how an ADT relates to Java's *interface*.
- Design a Java class according to a specification and/or interface, including choosing appropriate attributes and writing instance methods (ie, `toString`, `equals`, getters, setters and helper methods.)
- Instantiate objects
- Write a tester or test cases for a Java class that tests every methods in a class
- Be able to hand trace Java code, showing the contents of memory as the program executes and determine the output. These traces can and will include arrays and linked lists. (Ie, be able to draw memory trace diagrams and then show the corresponding output)
- Write instance methods that implement linked list functionality
- Box trace and write recursive functions.
- Determine and justify the worst case running time of Java methods
  (primarily O(1) and O(n): may extend to a $O(n^2)$).

Format

- No electronic devices (including phones or calculators) will be permitted.
- Expect the midterm to consist of questions that require you to:
  - Write small code sequences
  - Analyze code to determine its effects
  - Analyze code to determine its correctness
  - Separate correct and incorrect statements

Textbook Coverage
Chapters 1, 3, 4, 5, and 10