

## CSC 112 Test 2: Study Guide

At this point in the course, one should be able to demonstrate the following new skills:

- An understanding of what it means for an algorithm to be recursive or tail-recursive
- The ability to read medium complexity recursive and tail-recursive algorithms and trace their function calls
- The ability to define base-cases (stopping conditions) for arbitrary difficulty problems
- The ability to write tail-recursive algorithms for simple problems and “standard” recursive algorithms for simple to medium difficulty problems
- The ability to verify the correctness of a simple recursive algorithm
- The ability to demonstrate an understanding of the relationship between recursion and looping
  
- An understanding of the definition of the “searching” problem and the “sorting” problem
- The ability to read algorithms purported to solve the searching or sorting problems and evaluate their correctness.
- The ability to simulate the processes employed in binarySearch, insertion sort, selection sort, and merge sort.
- An understanding of the relative computational complexity of insertion sort, selection sort, and merge sort
- The ability to determine the computational complexity (Big Oh notation) for simple problems
- An understanding of the purpose and applicability of templates