COMP 200: Data Structures and Algorithms
Fall 2020
Lab 12: Sorting

Task 1: Implement InsertionSort algorithm for a given Python list.

Task 2: Implement the bottom-up MergeSort algorithm given on page 549 of the textbook.

Task 3: Implement the in-place Quicksort algorithm given on page 559 of the textbook.

Task 4: Now combine Task 1 and Task 2 so that when the elements are fewer than 50 in a merge step, InsertionSort is used and for greater than 50 the elements are merged using the Merge algorithm.

Task 5: Now combine Task 1 and Task 3 so that when the elements are fewer than 50 in a quicksort step, InsertionSort is used and for greater than 50 the elements are merged using the Quicksort algorithm.

Task 6: Write driver code to sort 10000 random numbers using your sort algorithms from Task 1, Task 2, Task 3, Task 4 and Task 5. Time your algorithms to determine which is the fastest.