CSE 102: Data Structure and Algorithm
Lab Sheet -2

Sorting

This lab involves understanding and implementing insertion sort and merge sort with the help of inversions present in the array.

What is an inversion in an array?
Given an array arr[], a pair arr[i] and arr[j] forms an inversion if arr[i] < arr[j] and i > j. For example, the array {1, 3, 2, 5} has one inversion (3, 2) and array {5, 4, 3} has inversions (5, 4), (5, 3) and (4, 3).

Insertion sort:

1. Write a CPP program to count the number of inversions of the input array using the idea of insertion sort. —-------------------(3 marks)

   Also write the highest number of inversions possible for an array using this technique in terms of n where n is the size of the array using comments at the end of your cpp code.----------------------->(1 mark)

Merge sort:

1. Write a CPP program to count the number of inversions of the input array using the idea of merge sort. ----------------------->(5 marks)
2. Will there be any relation between the time complexity and number of inversions present in the input array using the merge sort technique.Explain and mention the best and worst case time complexity using comments at the end of your cpp code--------->(1 marks).