Design and Analysis of Algorithms | IT252

Lab Exercise 5 | Week 6

a) Implement the **'Counting Inversions'** problem discussed in class. Given an input array of integers the program counts the number of inversions in the array. For e.g. for the input array A = {8,5,2,4,1} the program outputs 9. First implement the brute-force $O(n^2)$ algorithm that considers each pair and checks if it is an inverted pair or not. Then implement the O(nlogn) 'Divide and Conquer' algorithm as a separate function. The brute-force algorithm will help you check that your second algorithm is correct.

b) **Comparing run times:** Run the two algorithms on arrays of increasingly large size N (N=10,100,1000,10000,..) Randomly generate the numbers in an input array. Run the brute-force algorithm and the Divide and Conquer algorithm on the same input and compare the time taken by them to count the inversions.