United International University

Data Structure and Algorithms II Laboratory

Spring 241 CSE 2218

Sec: F Marks: 25

Assignment 01

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1. Count Inversion 13

Write a function **count_inversion** that counts the inversions in an array of **N** numbers *using divide and conquer*. If **i < j** and **A[i] > A[j]**, then the pair **(A[i], A[j])** is called an **inversion** of an array **A**. Write a main function that takes **N** numbers from users and uses the function **count_inversion** to count the number of inversions and print it.

sample input	sample output
5 8 4 -1 2 5	#inversions: 6
7 1 20 6 4 5 8 4	#inversions: 10
10 1 20 6 4 5 8 4 6 2 5	#inversions: 23

The sequence 8, 4, -1, 2, 5 has 6 inversions: (8,4), (8,-1), (8,2), (8,5), (4,-1), (4,2). The sequence 2, 4, 1, 3, 5 has 3 inversions (2,1), (4,1), (4,3).

Hint: The solution is similar to merge-sort. Merge two sorted lists into one output list, but while doing so, we also count the inversion

2. **Longest common prefix of n strings** **12**

Write a program that takes **N** strings from the user and finds the longest common prefix of those strings *using divide and conquer*.

sample input	**sample output**
3 Algolab Algorithms Algeria	Alg
4 Algolab Algorithms Algeria UIU	No common prefix