

Institute for Advancing Intelligence (IAI), TCG-CREST  
Assignment 01  
Ph.D Program Session: 2022–2023  
Subject: Design and Analysis of Combinatorial Algorithms

Submission Deadline: 16.02.2023

Full Marks: 100

Clarification Deadline : 14.02.2023

Instructions:

- For submission, each solution file must have a name  $AL0x0y\_firstName.c$ . Keep all such solution in a zip file with name  $algo\_assignment\_0x\_firstName.zip$ , and send them to  $laltu.sardar@outlook.com$  with subject as “ $algo\_assignment\_0x\_firstName$ ”.
- Language to be used: *python*.

1. Problem id #AL0101: Closest pair finding.

Problem 01: Given a set of distinct points in a plane, find a closest pair of points, using divide and conquer method.

- *Input*: a file “input\_algo\_01.txt”.  
Each line contains two floats separated by space.
- *Output*: on the terminal,  
 $(x_1, y_1) (x_2, y_2) d$   
Where  $d = dist((x_1, y_1)(x_2, y_2))$

[50]

2. Problem id #AL0102: Maximum sub-sequence finding.

Given a sequence of distinct integers, find a sub-sequence having largest sum using dynamic programming method.

- *Input*: a file “input\_algo\_02.txt”  
Only one line containing a set of integers each separated by spaces.
- *Output*: on the terminal,  
Two lines :  
Line 1: contains the largest sum,  
Line 2: the maximum sub-sequence.

[50]