

Department of Computer Science and Engineering, S V N I T, Surat.
End Semester Practical Exam, 2021-2022
B.Tech.-II (B) – Fourth Semester
Course: Design and Analysis of Algorithm (CS 206)

Date: 29th April 2022

Time: 02:00 PM to 04:00 PM

Exam Duration: 45 Minutes

Marks: 15

Problem Statements for the students whose admission number ends with
Odd number

Problem Statement 1:

Shrink an array by removing triplets that satisfy given constraints

Description:

Given an integer array, shrink it by removing adjacent triplets that satisfy the given constraints and return the total number of elements in the resultant array.

A triplet (x, y, z) can only be removed if, for a given number k, the second element y of the triplet is precise k more than the first element x. The third element, z, is precise k more than the second element y. The total number of elements in the final array should be as few as possible.

Example:

Input: A[] = [1, 2, 3, 5, 7, 8], k = 2

Output: 3

The adjacent triplet (3, 5, 7) can be removed from the array. The resultant array is [1, 2, 8] cannot be reduced further.

Input: A[] = [-1, 0, 1, 2, 3, 4], k = 1

Output: 0

The result is 0 since we can remove all elements from the array. First, the adjacent triplet (2, 3, 4) is removed. The array is now reduced to [-1, 0, 1], which forms another valid triplet and can be removed from the array.

Note that if the adjacent triplet (1, 2, 3) is removed from the array first, we cannot reduce the resultant array [-1, 0, 4] further.

Problem Statement 2:

Print all pairs of anagrams in a set of strings

Description:

Given a set of strings, print all pairs of anagrams together. Two strings, X and Y, are called anagrams if we can get a string Y by rearranging the letters of the string X and using all the characters of the string X exactly once.

For example, the following word pairs are anagrams since we can rearrange the first string to get the second string and vice-versa. The problem requires the anagrams to be grouped.

(actors, costar)

(altered, related)

(auctioned, education)

(aspired, despair)

(mastering, streaming)