**III Year A and B**

**Problem-Solving Questions**

**Date: 24.01.23 and 27.01.23**

**1.** Given an array **A** of **N** integers, find any 3 elements in it such that A[i] < A[j] < A[k] and i < j < k.

**Example 1:**

**Input:**

N = 5

A[] = {1,2,1,1,3}

**Output:** 1

**Explanation:** a sub-sequence 1 2 3 exist**.**

**Example 2:**

**Input:**

N = 3

A[] = {1,1,3}

**Output:** 0

**Explanation:** no such sub-sequence exists.

**2.** Given an array, find the maximum sum of the smallest and second smallest elements chosen from all possible sub-arrays. More formally, if we write all (nC2) sub-arrays of an array of size >=2 and find the sum of the smallest and second smallest, then our answer will be the maximum sum among them.

**Example 1:**

**Input :** arr[] = [4, 3, 1, 5, 6]

**Output :** 11

Subarrays with smallest and

second smallest are,

[4, 3]

smallest = 3 second smallest = 4

[4, 3, 1]

smallest = 1 second smallest = 3

[4, 3, 1, 5]

smallest = 1 second smallest = 3

[4, 3, 1, 5, 6]

smallest = 1 second smallest = 3

[3, 1]

smallest = 1 second smallest = 3

[3, 1, 5]

smallest = 1 second smallest = 3

[3, 1, 5, 6]

smallest = 1 second smallest = 3

[1, 5]

smallest = 1 second smallest = 5

[1, 5, 6]

smallest = 1 second smallest = 5

[5, 6]

smallest = 5 second smallest = 6

Maximum sum among all

above choices is, 5 + 6 = 11

**Example 2:**

**Input :** arr[] = {5, 4, 3, 1, 6}

**Output :** 9

3. Given an array of n integers(duplicates allowed). Print “Yes” if it is a set of contiguous integers else print “No”.

**Example 1:**

**â€‹Input :** arr[ ] = {5, 2, 3, 6, 4, 4, 6, 6}

**Output :** Yes

**Explanation:**

The elements  of array form a contiguous

set of integers which is {2, 3, 4, 5, 6}

so the output is "Yes".

**Example 2:**

**Input :** arr[ ] = {10, 14, 10, 12, 12,

13, 15}

**Output :** No

**4.** A step array is an array of integer where each element has a difference of at most k with its neighbor. Given a key x, we need to find the index value of k if multiple elements exist, return the first occurrence of the key.

**Example 1:**

**â€‹Input :** arr[ ] = {4, 5, 6, 7, 6}, K = 1

and X = 6

**Output :** 2

**Explanation:**

In an array arr 6 is present at index 2.

So, return 2.

**â€‹Example 2:**

**Input :** arr[ ] = {20 40 50}, K = 20

and X = 70

**Output :** -1