

# National University of Computer and Emerging Sciences, Lahore Campus



Course:	Programming Fundamentals	Course Code:	CS 1002
Program:	BS (Computer Science)	Semester:	Fall 2023
Due Date	5-NOV-2023 at 11:59 pm	Total Marks:	80
Section:	1C,1E & 1J	Page(s):	4
Type:	Assignment 3		

## Important Instructions:

1. You have to upload only .cpp file. Assignment in any other format (extension) will not be accepted and will be awarded with zero marks. You have to make a zip file and upload it onto the google classroom submission folder. For question 1, name your solution file with your roll number, i.e., Q1\_22L\_1111.cpp. Similarly, you can name other questions.
2. You are not allowed to copy solutions from other students. We will check your code for plagiarism using plagiarism checkers. If any sort of cheating is found, negative marks will be given to all students involved.
3. Late submission of your solution is not allowed

### Question # 1:

[Marks: 10]

Write a C++ program that has an integer array of size N. The array contains N integers. You can hardcode the elements of the array. Now the program will ask the user to enter an integer number. Your program will tell whether the number given by the user is the summation of any three numbers in the array. Also print the three numbers whose sum is equal to the given number.

For example, if the array is: 9, 4, 54, 23, 54, -23 0, 54, 5, 8 and the number entered by the user is 86, then your program will print 9, 54 and 23.

It is possible to have more than one triplet whose summation equals the given number. In this case, print all triplets. Such as, if the user enters 85, then the program will print: a. 54, 23, and 8

b. 54, 54, and -23

### Question 2:

[Marks: 5+5+5=15]

Write a program that takes upto 20 integers (Capacity) with -99.

1. Further your program should be able to identify the distinct elements and store it in an array named as DistinctArray and then using the print function it should display the DistinctArray. Distinct elements of an array are such that if an element appears more than once, then it should be printed once only.
2. Further your program should be able to identify the unique element and store it in an array named as UniqueArray and then using the print function it should display the UniqueArray. Unique elements of an array are the ones which occur only once in an array.
3. Now your program should make sure that the DistinctArray should be sorted in increasing order.

### Sample Input:

20 11 12 20 16 15 12 16 8 12 -99 **Sample**

**Output:**

Distinct Element in Sorted (Increasing order) are: 8 11 12 15 16 20

Unique Element in Sorted(Decreasing order ) are: 15 11 8

**Question 3:**

**[Marks: 10]**

You have an array of zeros and ones, move all zeros to the left and ones to the right.

**Sample Input:**

Enter the Array. Enter -1 to exit: 1 0 0 1 0 1 0 0 0 -1 **Sample**

**Output:**

Segregated Array: 0 0 0 0 0 0 1 1 1

**Question 4:**

**[Marks: 20]**

You are given an array of Prime, Fibonacci and Non-PrimeFibonacci (the numbers neither prime nor fibonacci) numbers in random order. Segregate all Fibonacci on left side, Prime on right side and Non-PrimeFibonacci in the middle of the array. If a number is Prime and Fibonacci both, it's your choice to treat it as a Prime or Fibonacci number. Also find the MinimumSwapsCount - the number of swaps required to get the final array.

Sample Input: Size: 13													
INDEX	0	1	2	3	4	5	6	7	8	9	10	11	12
VALUE	2	5	4	17	34	11	10	8	18	24	23	89	1
Sample Output													
INDEX	0	1	2	3	4	5	6	7	8	9	10	11	12
VALUE	1	5	89	8	34	4	10	24	18	17	23	11	2
Minimum Swaps Count: 5													
Fibonacci elements are {1, 5, 89, 8, 34}, NonPrimeFibonacci elements are {4, 10, 24, 18} and													
Prime elements are {17, 23, 11, 2}													

**Question 5:**

**[Marks: 5]**

You are given an array and an index. You have to add an element at the given index of the given array and print the new array .

**Sample Input :** -6 -4 0 1 4 56 589

index = 2 , element = -2

**Sample Output:** -6 -4 -2 0 1 4 56 589

**Question 6:**

**[Marks: 10]**

Write a program which sorts the given data with respect to their frequency.

Hint: Do exactly the same process as you did for finding the unique first Us. Then make another array Freq holding frequencies, in which you should populate the frequency of each element in a unique array and save it as a Freq array. Now sort Us not on the basis of values but their corresponding frequency in Freq, the element with highest frequency should appear first in the Us array. Now replace all the values inside the data array D, by replacing each Us value one by one, as many times as their frequency is there in the Freq array.

**Sample input:**

Input Array: 2 5 76 53 2 89 4 76 2 2 43 53 53 2 89 76 76 -99 **Sample**

**Output:**

Us: 2 5 76 53 89 4 43

Freq: 5 1 4 3 2 1 1

Sorted Us: 2 76 53 89 5 4 43

New D Array: 2 2 2 2 2 76 76 76 76 53 53 53 89 89 5 4 43

**Question 7:**

**[Marks 5+5=10]**

**Part-1:**

Write a program that keeps on taking input from the user until the user enters -1 (at maximum 100 values) and then sort the even index values, in increasing order and odd index values, in decreasing order

Sample Input								
INDEX	0	1	2	3	4	5	6	7
VALUE	100	10	2	3	27	9	19	13
Sample Output								
INDEX	0	1	2	3	4	5	6	7
VALUE	2	13	19	10	27	9	100	3

**Part-2:**

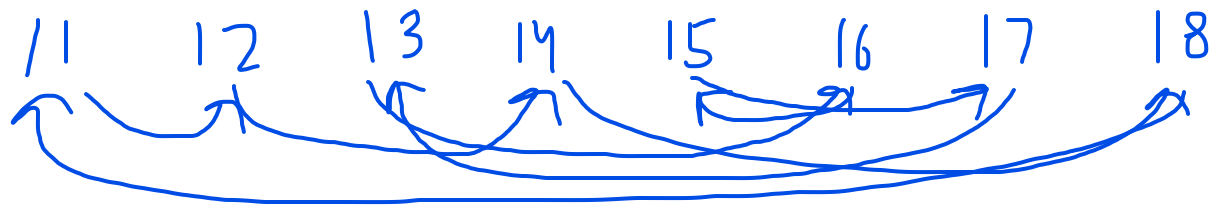
Given an array of integers, print and sort the array in such a way that the first element is first maximum and second element is first minimum and so on.

Sample Input: Size: 8

INDEX	0	1	2	3	4	5	6	7
VALUE	17	11	12	13	14	15	16	18

Sample Output

INDEX	0	1	2	3	4	5	6	7
VALUE	18	11	17	12	16	13	15	14



18 12 17 14 16 15 13 11

18 11 17 13 15 16 14 12

18 11 17 12 14 16 15 13

13 15 16 14