National University of Computer and Emerging Sciences, Lahore Campus

Course:	**Programming Fundamentals**	**Course Code:**	**CS 118**
Program:	**BCS & BSE**	**Semester:**	**Fall 2021**
Due Date	**12-DEC-2021 at 11:59 pm**	**Total Marks:**	**55**
Section:	**SE-1A & CS-1G**	**Page(s):**	**2**
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_21L_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: (Total Marks 10)

Write a program which displays the prime frequency of each element within a given range. If the given range index is not within the array boundary (Starting Index of an array or Ending Index of an array), select the nearest boundary index.

Sample Input:
Enter the Array. Enter -1 to exit: 4 3 9 1 51 4 4 7 7 3 7 9
Enter Starting Range Index: 2
Enter Ending Range Index: 7
Sample Output:
Frequency of 4 is prime frequency which is 2
Note: Prime frequency of an element means the number of occurrences of that element should be a prime number.

Question 3: (Total 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 4: (Total Marks 10+10=20)

1. 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

2. You have to read three letters representing three fruits ‘b’ for a banana, ‘m’ for mangoes and ‘a’ for apples, now segregate the values in such a way that all b’s are in the beginning and then m’s mangoes and then a’s apples.

Sample Input:
Enter the Array. Enter -1 to exit: b m m m a a b a m a m b b b a
Sample Output:
Segregated Array: b b b b b m m m m m a a a a a

Best Of Luck!