Assignment II
Lab MC504

Send your assignment solution to mc504lab@gmail.com.
Deadline: 20.01.2021, 12 midnight.
Put all files into one folder create a zip and name it as <**RollNo**>_<**Assignment_<No>** and mention the files name as: Q1.c, Q2.c and so on. In each file please mention your roll number.
Subject of mail should be: <**RollNo**>_**Assignment_<No>**. **For example : 1911MC04_Assignment_II.**
You have to take inputs from user. Otherwise marks (40%) will be deducted.

CSE :(1Q,2Q,3Q,4Q,5Q,6Q)
Non-CSE :(IQ,IIQ,IIIQ,IVQ,VQ,VIQ)

1Q.
Given an array and a number k where k is smaller than the size of array, the task is to find the k'th smallest element in the given array. It is given that all array elements are distinct.

Example: Input A[]={7, 10, 4, 3, 20, 15}, k=3
Output 7
Input A[]={7, 10, 4, 3, 20, 15}, k=5
Output 15

2Q.
Given an array A[ ] you have to find the number of subarrays whose sum is an even number.
Example: Input: A[]={1, 2, 2, 3, 4, 1}

Output: 9

Explanation:
{1, 2, 2, 3} Sum = 8
{1, 2, 2, 3, 4} Sum as = 12
{2} Sum as = 2 (At index 1)
{2, 2} Sum as Sum = 4
{2, 2, 3, 4, 1} Sum as = 12
{2} Sum as = 2 (At index 2)
{2, 3, 4, 1} Sum as = 10
{3, 4, 1} Sum as = 8
{4} Sum as = 4

Q3.

```
        *
      * * *
    * * * * *
  * * * * * * *
```

Write a C program to print the above structure.

Q4.

Write a C program to print first twenty twin prime pairs. A twin prime is a prime number that is either 2 less or 2 more than another prime number —for example, the twin prime pair (41, 43).

Q5

Starting with a 1-indexed array of zeros and a list of operations, for each operation add a value to each the array element between two given indices, inclusive. Once all operations have been performed, return the maximum value in the array.

E.g.

Input:-

N =10 :- number of elements in the array.

Queries = [[1,5,3],[4,8,7],[6,9,1]].

for reference

Interpretation of queries.
a b k
1 5 3
4 8 7
6 9 1
Add the values of **k** between the indices **a** and **b** inclusive:
index-> 1 2 3 4 5 6 7 8 9 10
[0,0,0, 0, 0,0,0,0,0, 0]
[3,3,3, 3, 3,0,0,0,0, 0]
[3,3,3,10,10,7,7,7,0, 0]
[3,3,3,10,10,8,8,8,1, 0]

Output :-

The largest value is 10 after all operations are performed.

E.g-2

Input:-

```
5 3 # no of elements, # of queries
1 2 100
2 5 100
3 4 100
```

Output:-
200

Q6
Given a 6x6 2D Array ,arr :

```
1 1 1 0 0 0
0 1 0 0 0 0
1 1 1 0 0 0
0 0 0 0 0 0
0 0 0 0 0 0
0 0 0 0 0 0
```

We define an hourglass in to be a subset of values with indices falling in this pattern in arr 's graphical representation:

```
a b c
 d
e f g
```

There are 16 hourglasses in arr, and an hourglass sum is the sum of an hourglass' values. Calculate the hourglass sum for every hourglass in arr, then print the maximum hourglass sum.

For example, given the 2D array:

```
-9 -9 -9  1 1 1
 0 -9  0  4 3 2
-9 -9 -9  1 2 3
 0  0  8  6 6 0
 0  0  0 -2 0 0
 0  0  1  2 4 0
```

We calculate the following 16 hourglass values:

```
-63, -34, -9, 12,
-10, 0, 28, 23,
-27, -11, -2, 10,
9, 17, 25, 18
```

Our highest hourglass value is 28 from the hourglass:

```
0 4 3
  1
8 6 6
```

Constraints:

- **-9 <= arr[i][j]<= -9**
- **0<= i,j <=5**

NON-CSE

IQ.
Write a program to merge two sorted arrays.

Example: arr1[]={1,3,5,7,9} arr2[]={2,4,6,8}
Output: arr3[]={1,2,3,4,5,6,7,8,9}

IIQ.
Given an array of integers containing duplicate elements. The task is to find the sum of all odd occurring elements in the given array. That is the sum of all such elements whose frequency is odd in the array.
Example:**Input** : arr[] = {1, 1, 2, 2, 3, 3, 3}
Output : 9
The odd occurring element is 3, and it's number
of occurrence is 3. Therefore sum of all 3's in the
array = 9.

Input : arr[] = {10, 20, 30, 40, 40}
Output : 60
Elements with odd frequency are 10, 20 and 30.
Sum = 60.

IIIQ.
Write a C program to delete an element from an array at specified position and shift all the elements to the left.

IVQ.

```
        *
      * * *
    * * * * *
  * * * * * * *
```

Write a C program to print the above structure.

VQ Given an array and a value, find if there is a triplet in the array whose sum is equal to the given value. If there is such a triplet present in the array, then print the triplet and return true. Else return false.

Input: array = {12, 3, 4, 1, 6, 9}, sum = 24;
Output: 12, 3, 9
Explanation: There is a triplet (12, 3 and 9) present
in the array whose sum is 24.

Input: array = {1, 2, 3, 4, 5}, sum = 9
Output: 5, 3, 1

Explanation: There is a triplet (5, 3 and 1) present
in the array whose sum is 9.

VIQ.

Given an array of random numbers, Push all the zero's of a given array to the end of the array. For example, if the given arrays is {1, 9, 8, 4, 0, 0, 2, 7, 0, 6, 0}, it should be changed to {1, 9, 8, 4, 2, 7, 6, 0, 0, 0, 0}. The order of all other elements should be the same.

Input : arr[] = {1, 2, 0, 4, 3, 0, 5, 0};
Output : arr[] = {1, 2, 4, 3, 5, 0, 0,0};

Input : arr[] = {1, 2, 0, 0, 0, 3, 6};
Output : arr[] = {1, 2, 3, 6, 0, 0, 0};