Practice Problems from Array (1D, 2D)

Solve the following problems using C++

1. Develop a program that stores your Name and ID using two different arrays and displays your information at the end.

2. Develop a program that has an array which stores 4 integer numbers and 4 floating point numbers by asking the user for inputs. The program estimates the summation, average as well as multiplication of the stored numbers and prints all the results.

3. Develop a program that takes three student's CGPAs as inputs using a single array and finds the lowest CGPA.

4. Create an array to store five integer numbers by asking user for the inputs. Now, develop a program that checks whether each number present in the array is an even number or an odd number and replaces the even numbers with a '0' and odd numbers with a '1'. Later, the program prints the modified array.

5. Build a program that has two arrays where the size of each array is 6 to store floating point and integer numbers. Later, the program multiplies each index element of the first array with each index element of the second array, but in the opposite order of the second array's indexes.

```
Sample:
    Input: 2 4 3
    Input: 4 1 3
   Output: 6 4 12
```

6. Develop a program that takes a word as input from the user using a character array and prints only the vowels present in the inputted word.

```
Sample:
    Input: Hello
    Output: e, o
```

7. Develop a program that has an array which can store integer numbers as well as floating point numbers and the program checks each element of the array whether the number is an integer number or a floating-point number.

8. Create an array to store 5 years by taking inputs from the user. Now, develop a program that checks each year present in the array to determine if the year is leap year and prints only the leap years from the array.

Sample:
Inputted Years: 2024 1991 2400 2008 1800
Output: Leap years present in the array are: 2024, 2400, 2008

9. Build a program that takes a word or a number which has more than one element as input from the user using a character array. Afterwards, the program checks whether the input is palindrome or not palindrome.

Sample:
Input: MADAM
Output: Palindrome

Input: 2002
Output: Palindrome

10. Build a program that takes five positive integer numbers using an array to check whether each number present in the array is a prime number or not a prime number.

11. Build a program that stores a word "Bangladeshi" using a character array and makes a full pyramid from the inputted word.

Sample:

```
          B
        B A N
      B A N G L
    B A N G L A D
  B A N G L A D E S
B A N G L A D E S H I
```

12. Develop a program that stores five countries' names using a single 2D array and prints the names at the end.

13. Develop a program that has a 2D array that can hold floating point numbers. The 2D array has 2 rows and four columns. The program finds the largest element from the first row, the smallest element from the second row, multiplies them and displays the largest element, smallest element as well as the multiplied result.

14. Develop a program that has a 2D array that stores floating point numbers given by user. Later, the program takes a number as input and searches the number whether it is present or not present in the array.

15. Develop a program that has two 2D matrices of same size. Later, the program displays the rows, columns of each array as well as performs matrix addition, subtraction, and multiplication between the matrices. Finally, the program prints all the results.

Problem: Write a program that stores five integer numbers using an array and checks each number whether it is a positive number or a negative number.

Solution:

```
#include<iostream>
using namespace std;
int main(){
   int arr[5];

   cout<<"Enter the elements of the array: ";
   for(int i=0; i<5; i++){
      cin>>arr[i];

      if(arr[i]>=0){
         cout<<arr[i]<<" is a positive number."<<endl;
      }

      else{
         cout<<arr[i]<<" is a negative number."<<endl;
      }
   }

   return 0;
}
```

Problem: Write a program that stores a word using a character and takes an alphabet as input from the user. Later, the program checks whether the inputted alphabet is present in the array or not present in the array.

Solution:

```
#include<iostream>
using namespace std;
int main(){
   char arr[5]={'P','a','R','i','S'};
   char Alphabet; bool flag=false; int index;

   cout<<"Enter the element that you want to search: ";
   cin>>Alphabet;

   for(int i=0; i<5; i++){
      if(arr[i]==Alphabet){
         flag=true;
         index=i;
         break;
      }
```

```
    }

    if(flag==true){

        cout<<Alphabet<<" is present in the array at index "<<index<<endl;
    }
    else{
        cout<<Alphabet<<" is not present in the array"<<endl;
    }
    return 0;
}
```

Problem: Write a program that has a 2D array which can hold floating point numbers. Later, the program estimates the number of rows, columns of the array and displays the summation and average of the numbers present in the array.

Solution:

```
#include<iostream>
using namespace std;
int main(){
    float arr[2][3], sum=0, avg=0;
    int rows=0, cols=0, total_elements=0;

    rows=sizeof(arr)/sizeof(arr[0]);
    cols=sizeof(arr[0])/sizeof(float);
    total_elements=rows*cols;

    cout<<"Enter "<<total_elements<<" numbers: ";

    for(int i=0; i<rows; i++){
        for(int j=0; j<cols; j++){
            cin>>arr[i][j];
            sum=sum+arr[i][j];
        }
    }

    avg=sum/total_elements;
    cout<<"Sum: "<<sum<<endl;
    cout<<"Average: "<<avg;

    return 0;
}
```