Assignment – 1

1.Write a c++ program that prints “Hello, World!” to the console.

Hello.cpp > main()

```cpp
#include<iostream>
using namespace std;
int main(){
    cout<<"Hello";
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS D:\Akhil\DAC\C++@CDAC> g++ .\Hello.cpp
PS D:\Akhil\DAC\C++@CDAC> ./a
Hello
PS D:\Akhil\DAC\C++@CDAC>
```

2.Write a C++ program that takes two integers input from the user and prints their sum.

TwoIntSum.cpp > main()

```cpp
#include<iostream>
using namespace std;
int main(){
    int a,b;
    cout<<"Enter a and b:";
    cin>> a>>b;
    cout<<"Sum of two numbers:"<<a+b;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS D:\Akhil\DAC\C++@CDAC> g++ .\TwoIntSum.cpp
PS D:\Akhil\DAC\C++@CDAC> ./a
Enter a and b:23 17
Sum of two numbers:40
PS D:\Akhil\DAC\C++@CDAC>
```

3 Write a C++ program to swap two numbers without using third variable.

SwapWithoutThird.cpp > main()

```cpp
#include<iostream>
using namespace std;
int main(){
    int a,b;
    cout<<"Enter two numbers:";
    cin>>a>>b;
    a = a+b;
    b = a-b;
    a = a-b;
    cout<<"After Swapping:"<<a<<" "<<b;
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS
PS D:\Akhil\DAC\C++@CDAC> g++ .\SwapWithoutThird.cpp
PS D:\Akhil\DAC\C++@CDAC> ./a
Enter two numbers:23 32
After Swapping:32 23
PS D:\Akhil\DAC\C++@CDAC>
```

4 Write a C++ program that checks whether a number entered by the user is even or odd.

EvenOrOdd.cpp > main()

```cpp
#include<iostream>
using namespace std;
int main(){
    int num;
    cout<<"Enter a number:";
    cin>>num;
    if(num%2==0){
        cout<<num<<" is even number";
    }else{
        cout<<num<<" is odd number";
    }

    return 0;
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS
PS D:\Akhil\DAC\C++@CDAC> g++ .\EvenOrOdd.cpp
PS D:\Akhil\DAC\C++@CDAC> ./a
Enter a number:22
22 is even number
```

5 Write a C++ program that takes two number and an operator(+,-,*,/) as input and performs the corresponding operation.

ArithWithSwitch.cpp > main()

```cpp
#include<iostream>
using namespace std;
int main(){
    int a,b;
    char op;
    cout<<"Enter two numbers:";
    cin>>a>>op>>b;
    switch(op){
        case '+':cout<<"Sum of two numbers:"<<a+b;
                 break;
        case '-':cout<<"Subtraction of numbers:"<<a-b;
                 break;
        case '*':cout<<"Multiplication of numbers:"<<a*b;
                 break;
        case '/':cout<<"Division of two numbers:"<<a/b;
                 break;
        case '%':cout<<"Modulo division of two numbers:"<<a%b;
                 break;
        default:cout<<"Enter valid operator.";
                break;
    }

}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS D:\Akhil\DAC\C++@CDAC> g++ .\ArithWithSwitch.cpp
PS D:\Akhil\DAC\C++@CDAC> ./a
Enter two numbers:2 * 3
Multiplication of numbers:6
PS D:\Akhil\DAC\C++@CDAC>
```

6. Write a c++ program that takes n numbers as input , stores them in an array, and finds the largest number.

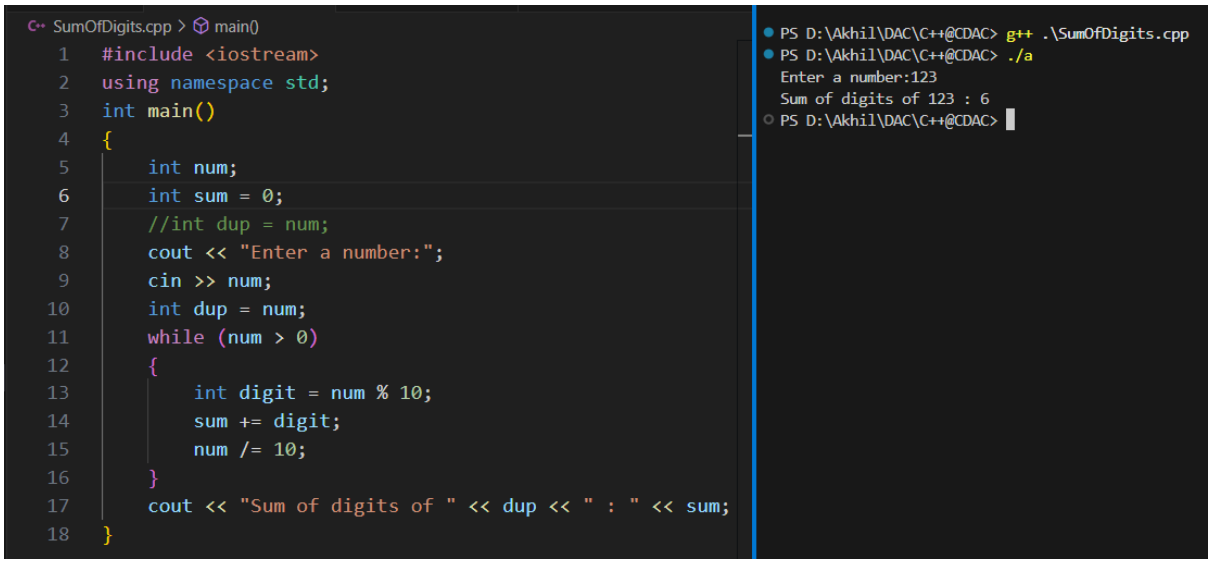
NnumbersInArrayAndMax.cpp > main()

```cpp
#include <iostream>
using namespace std;
int main()
{
    int num;
    cout << "Enter how many numbers do you want:";
    cin >> num;
    int arr[num];
    for (int i = 0; i < num; i++)
    {
        cin >> arr[i];
    }

    for (int i = 0; i < num; i++)
    {
        cout << arr[i] << " ";
    }

    int max = arr[0];
    for (int i = 0; i < num; i++)
    {
        if (max < arr[i])
        {
            max = arr[i];
        }
    }
    cout << "\n";
    cout << "\nMaximum number in the array:" << max;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS D:\Akhil\DAC\C++@CDAC> g++ .\NnumbersInArrayAndMax.cpp
PS D:\Akhil\DAC\C++@CDAC> ./a
Enter how many numbers do you want:5
1
2
3
4
5
1 2 3 4 5

Maximum number in the array:5
PS D:\Akhil\DAC\C++@CDAC>
```

7.Write a C++ program that takes an integer input and calculates the sum of digits

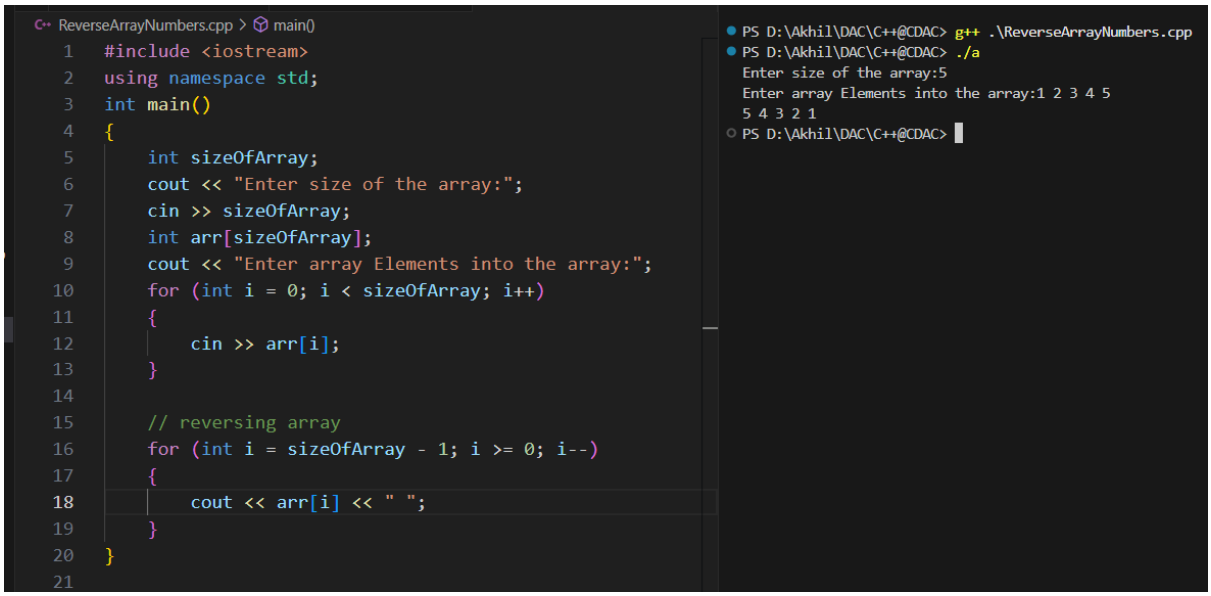


SumOfDigits.cpp > main()

```cpp
#include <iostream>
using namespace std;
int main()
{
    int num;
    int sum = 0;
    //int dup = num;
    cout << "Enter a number:";
    cin >> num;
    int dup = num;
    while (num > 0)
    {
        int digit = num % 10;
        sum += digit;
        num /= 10;
    }
    cout << "Sum of digits of " << dup << " : " << sum;
}
```

```
PS D:\Akhil\DAC\C++@CDAC> g++ .\SumOfDigits.cpp
PS D:\Akhil\DAC\C++@CDAC> ./a
Enter a number:123
Sum of digits of 123 : 6
PS D:\Akhil\DAC\C++@CDAC>
```

8 Write a C++ program to take n elements in an array and print them in the reverse order.



ReverseArrayNumbers.cpp > main()

```cpp
#include <iostream>
using namespace std;
int main()
{
    int sizeOfArray;
    cout << "Enter size of the array:";
    cin >> sizeOfArray;
    int arr[sizeOfArray];
    cout << "Enter array Elements into the array:";
    for (int i = 0; i < sizeOfArray; i++)
    {
        cin >> arr[i];
    }

    // reversing array
    for (int i = sizeOfArray - 1; i >= 0; i--)
    {
        cout << arr[i] << " ";
    }
}
```

```
PS D:\Akhil\DAC\C++@CDAC> g++ .\ReverseArrayNumbers.cpp
PS D:\Akhil\DAC\C++@CDAC> ./a
Enter size of the array:5
Enter array Elements into the array:1 2 3 4 5
5 4 3 2 1
PS D:\Akhil\DAC\C++@CDAC>
```

9. Write a C++ program to check if a given number is palindrome or not

NumberPalindrome.cpp > main()

```cpp
#include <iostream>
using namespace std;
int main()
{
    int num;
    cout << "Enter a number:";
    cin >> num;
    int dup = num;
    int reverseNum = 0;
    while (num > 0)
    {
        int digit = num % 10;
        reverseNum = reverseNum * 10 + digit;
        num /= 10;
    }

    if (dup == reverseNum)
    {
        cout << dup << " is a palindrome";
    }
    else
    {
        cout << dup << " is not a palindrome";
    }
}
```

```
PS D:\Akhil\DAC\C++@CDAC> g++ .\NumberPalindrome.cpp
PS D:\Akhil\DAC\C++@CDAC> ./a
Enter a number:12321
12321 is a palindrome
PS D:\Akhil\DAC\C++@CDAC> ./a
Enter a number:1234
1234 is not a palindrome
PS D:\Akhil\DAC\C++@CDAC>
```

10. Write a C++ program to print the Fibonacci series up to n terms.

Fibonacci.cpp > main()

```cpp
#include <iostream>
using namespace std;
int main()
{
    int zerothTerm = 0;
    int firstTerm = 1;
    int terms;
    cout << "Enter how many terms you need:";
    cin >> terms;
    cout << zerothTerm << " " << firstTerm;
    for (int i = 2; i < terms; i++)
    {
        int secondTerm = zerothTerm + firstTerm;
        zerothTerm = firstTerm;
        firstTerm = secondTerm;
        cout << " " << secondTerm;
    }
}
```

```
PS D:\Akhil\DAC\C++@CDAC> g++ .\Fibonacci.cpp
PS D:\Akhil\DAC\C++@CDAC> ./a
Enter how many terms you need:10
0 1 1 2 3 5 8 13 21 34
PS D:\Akhil\DAC\C++@CDAC>
```

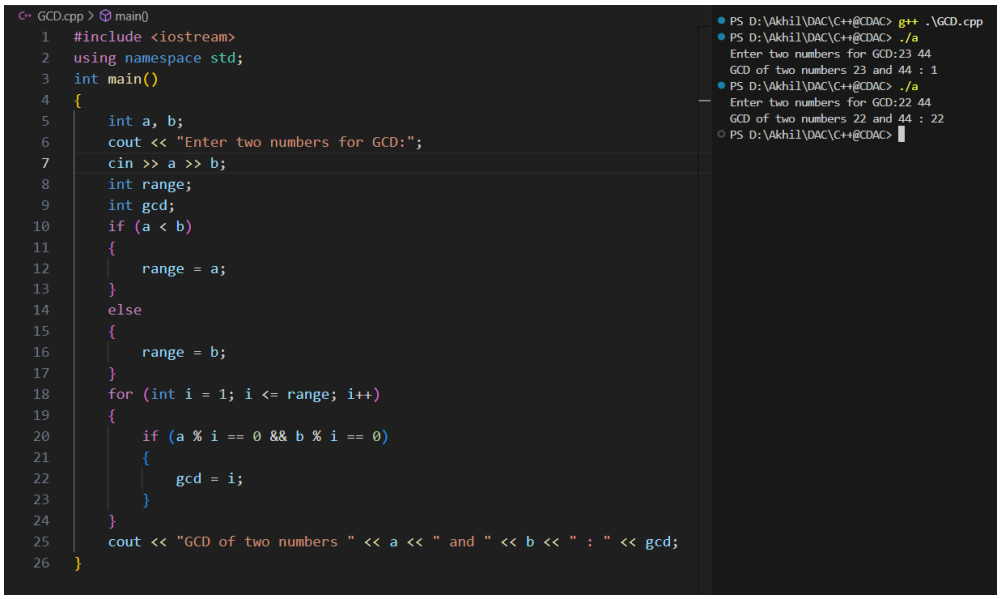
11. Write a C++ program that takes a string input and the counts the number of vowels.

VowelCount.cpp > main()

```cpp
#include <iostream>
using namespace std;
int main()
{
    string str;
    cout<<"Enter a string:";
    cin>>str;
    char vowels[] = {'a', 'e', 'i', 'o', 'u', 'A', 'E', 'I', 'O', 'U'};
    int count = 0;

    for (int i = 0; i < str.length(); i++)
    {
        for (int j = 0; j < 10; j++)
        {
            if (str[i] == vowels[j])
            {
                count++;
            }
        }
    }
    cout << "Number of vowels in the string " << str << " is :" << count;
}
```

```
PS D:\Akhil\DAC\C++@CDAC> g++ .\VowelCount.cpp
PS D:\Akhil\DAC\C++@CDAC> ./a
Enter a string:Akhil
Number of vowels in the string Akhil is :2
PS D:\Akhil\DAC\C++@CDAC>
```

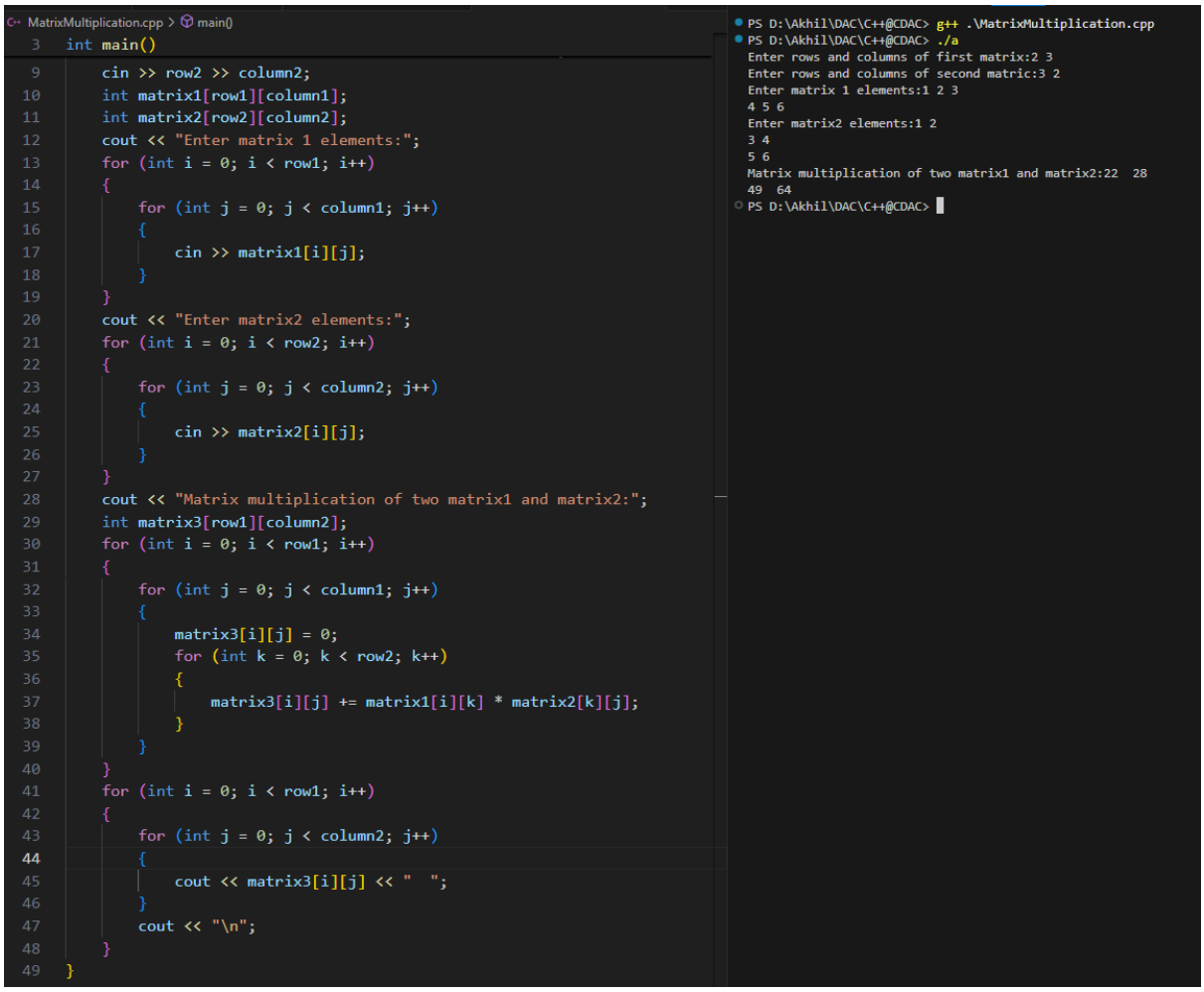
12.Write a C++ program to find the GCD of numbers.



```cpp
#include <iostream>
using namespace std;
int main()
{
    int a, b;
    cout << "Enter two numbers for GCD:";
    cin >> a >> b;
    int range;
    int gcd;
    if (a < b)
    {
        range = a;
    }
    else
    {
        range = b;
    }
    for (int i = 1; i <= range; i++)
    {
        if (a % i == 0 && b % i == 0)
        {
            gcd = i;
        }
    }
    cout << "GCD of two numbers " << a << " and " << b << " : " << gcd;
}
```

```
PS D:\Akhil\DAC\C++@CDAC> g++ .\GCD.cpp
PS D:\Akhil\DAC\C++@CDAC> ./a
Enter two numbers for GCD:23 44
GCD of two numbers 23 and 44 : 1
PS D:\Akhil\DAC\C++@CDAC> ./a
Enter two numbers for GCD:22 44
GCD of two numbers 22 and 44 : 22
PS D:\Akhil\DAC\C++@CDAC>
```

13. Write a C++ program to multiply two Matrices.



```cpp
int main()
{
    cin >> row2 >> column2;
    int matrix1[row1][column1];
    int matrix2[row2][column2];
    cout << "Enter matrix 1 elements:";
    for (int i = 0; i < row1; i++)
    {
        for (int j = 0; j < column1; j++)
        {
            cin >> matrix1[i][j];
        }
    }
    cout << "Enter matrix2 elements:";
    for (int i = 0; i < row2; i++)
    {
        for (int j = 0; j < column2; j++)
        {
            cin >> matrix2[i][j];
        }
    }
    cout << "Matrix multiplication of two matrix1 and matrix2:";
    int matrix3[row1][column2];
    for (int i = 0; i < row1; i++)
    {
        for (int j = 0; j < column1; j++)
        {
            matrix3[i][j] = 0;
            for (int k = 0; k < row2; k++)
            {
                matrix3[i][j] += matrix1[i][k] * matrix2[k][j];
            }
        }
    }
    for (int i = 0; i < row1; i++)
    {
        for (int j = 0; j < column2; j++)
        {
            cout << matrix3[i][j] << "  ";
        }
        cout << "\n";
    }
}
```

```
PS D:\Akhil\DAC\C++@CDAC> g++ .\MatrixMultiplication.cpp
PS D:\Akhil\DAC\C++@CDAC> ./a
Enter rows and columns of first matrix:2 3
Enter rows and columns of second matric:3 2
Enter matrix 1 elements:1 2 3
4 5 6
Enter matrix2 elements:1 2
3 4
5 6
Matrix multiplication of two matrix1 and matrix2:22  28
49  64
PS D:\Akhil\DAC\C++@CDAC>
```

14. Write a C++ program to check whether the given number is Armstrong number or not

ArmstrongNumber.cpp > main()

```cpp
#include <iostream>
#include <cmath>
using namespace std;
int main()
{
    int num;
    cout << "Enter number:";
    cin >> num;
    int dup = num;
    int count = 0;
    while (num > 0)
    {
        num /= 10;
        count++;
    }
    num = dup;
    int sum = 0;
    while (num > 0)
    {
        int digit = num % 10;
        sum += pow(digit, count);
        num /= 10;
    }
    if (sum == dup)
    {
        cout << dup << " is armstrong number";
    }
    else
    {
        cout << dup << " is not armstrong number";
    }
}
```

```
PS D:\Akhil\DAC\C++@CDAC> g++ .\ArmstrongNumber.cpp
PS D:\Akhil\DAC\C++@CDAC> ./a
Enter number:153
153 is armstrong number
PS D:\Akhil\DAC\C++@CDAC> ./a
Enter number:123
123 is not armstrong number
PS D:\Akhil\DAC\C++@CDAC>
```

15 Write a C++ program to Print Pascals Triangle upto n rows

PascalsTriangle.cpp > main()

```cpp
#include <iostream>
#include <iomanip> // for setw
using namespace std;

int main()
{
    int n;
    cout<<"Enter how many rows:";
    cin>>n;
    int triangle[n][n] = {0}; // large enough

    triangle[0][0] = 1;

    for (int i = 0; i < n; i++)
    {
        cout << "\n";

        for (int k = n; k > i; k--)
        {
            cout << "  ";
        }

        for (int j = 0; j <= i; j++)
        {
            if (j == 0 || j == i)
            {
                triangle[i][j] = 1;
            }
            else
            {
                triangle[i][j] = triangle[i - 1][j - 1]
            }

            cout << setw(4) << triangle[i][j]; // forma
        }
    }

    return 0;
}
```

```
PS D:\Akhil\DAC\C++@CDAC> g++ .\PascalsTriangle.cpp
PS D:\Akhil\DAC\C++@CDAC> ./a
Enter how many rows:6

                1
            1   1
        1   2   1
    1   3   3   1
1   4   6   4   1
1   5  10  10   5   1
PS D:\Akhil\DAC\C++@CDAC>
```