WEEK 5: OPERATOR OVERLOADING

1. Write a C++ program to create a class called Matrix using 2-Dimensional array of integers. Implement the following by overloading the operator == which checks compatibility of the two matrices to be added and subtracted. Perform the following by overloading + and - operators.

```
if (m1 == m2)
{
    m3 = m1 + m2;
    m4 = m1 - m2;
}
else
{
    // Display an error message
}
```

where m1, m2, m3, and m4 are objects of Matrix class.

Program:

```
// Author Name: Al-Fareed
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// Name of Program: Program to compare, add
// and subtract two matrices using operator overloading
//
#include<iostream>
using namespace std;

class matrix
{
    int a, b;
    int arr[9][9];
```

```
public: matrix()
    {
        a=b=0;
    }
    matrix(int x, int y)
    {
        a=x;
        b=y;
    }
void accept()
{
    for(int i=0; i<a; i++)
    {
        for(int j=0; j<b; j++)
        {
            cout<<" a";
            cin>>arr[i][j];
        }
    }
}
void display()
{
    for(int i=0, i<a; i++)
    {
        cout<<" ";
        for (int j=0; j<b; j++)
        {
            cout<<arr[i][j]<<" \t";
        }
        cout<<"\n";
    }
}
```

```
int operator == (matrix m)
{
    if(a==m.a && b==m.b)
        return 1;
    else
        return 0;
}
matrix operator+(matrix x)
{
    matrix m5;
    for(int i=0; i<a; i++)
    {
        for(int j=0; j<b; j++)
        {
            m5.arr[i][j]=arr[i][j]+x.arr[i][j];
        }
        m5.a=a;
        m5.b=b;
    }
    return m5;
}
matrix operator - (matrix x)
{
    matrix m6;
    for(int i=0; i<a; i++)
    {
        for(int j=0; j<b; j++)
        {
            m6.arr[i][j]=arr[i][j]-x.arr[i][j];
        }
        m6.a=a;
        m6.b=b;
    }
```

```
    return m6;
  }
};
int main()
{
    int m, j, n, i;
  cout<<" Enter the size of the ~~element~~ 1st matrix:";
  cin>>m>>n;
  cout<<" Enter the size of the 2nd matrix:";
   cin>>i>>j;
  matrix m2(i,j);
  matrix m1(m,n);
  matrix m4, m3;
   if(m1 == m2)
   {
      cout<<"\n Enter Matrix Elements for 1st
Matrix :\n");
   m1.accept();
  cout<<"\n Entered 1st Matrix is :\n";
   m1.display();
  cout<<"\n Enter matrix Elements for 2nd Matrix:
   \n";
   m2.accept();
  cout<<"\n Entered 2nd Matrix is:\n";
   m2.display();
    m3= m1+m2;
   cout<<" Addition of Matrices are:\n";
   m3.display();
   cout<<" Subtraction of two Matrices are:\n";
   m4= m1-m2;
   m4.display();
}
```

```
else
{
    cout<<" Entered size doesn't match";
}
return 0;
}
```

OUTPUT:

Enter the size of the 1st Matrix: 2 2
Enter the size of the 2nd Matrix: 2 2

Enter matrix Elements for 1st Matrix:
1 2
3 4
~~Enter matrix Elements for 2nd Matrix:~~
~~1 2 3 4~~
Entered 1st Matrix is:
1 2
3 4
Enter matrix Elements for 2nd Matrix:
1 2 3 4
Entered 2nd Matrix is:
1 2
3 4
Addition of two matrices are:
2 4
6 8
Substraction of two matrices are:
0 0
0 0