Fop Lab Task 9

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Section: B

(NOTE: Codes are attached in main.cpp file.**)**

TASK 1

```cpp
#include <bits/stdc++.h>
using namespace std;
int main()
{
    int rows=3, cols=3, matrix[rows][cols], ldsum=0, rdsum=0;

    for (int i=0; i<rows; i++) {
        for (int j=0; j<cols; j++) {
            cout<<"Enter element at position "<<i<<","<<j<<": ";
            cin>>matrix[i][j];
        }
    }

    for (int i=0; i<rows; i++)
        ldsum+=matrix[i][i];

    for (int i=0, j=cols-1; i<rows; i++, j--)
        rdsum+=matrix[i][j];

    cout<<"Left Diagonal Sum: "<<ldsum<<endl;
    cout<<"Right Diagonal Sum: "<<rdsum;
    return 0;
}
```

```
"C:\Users\Hp\Downloads\Documents\NUST Content\Semester 1\Computer Systems & Programming Lab\week 11\week11\b
Enter element at position 0,0: 1
Enter element at position 0,1: 2
Enter element at position 0,2: 3
Enter element at position 1,0: 4
Enter element at position 1,1: 5
Enter element at position 1,2: 6
Enter element at position 2,0: 7
Enter element at position 2,1: 8
Enter element at position 2,2: 9
Left Diagonal Sum: 15
Right Diagonal Sum: 15
Process returned 0 (0x0)   execution time : 8.003 s
Press any key to continue.
```

TASK 2

```cpp
#include <bits/stdc++.h>
using namespace std;
void add3x3matrix(int m1[][3], int m2[][3], int r[][3]) {
    for (int i=0; i<3; i++) {
        for (int j=0; j<3; j++)
            r[i][j] = m1[i][j]+m2[i][j];
    }
}
void get3x3matrix(int arr[][3]){
    for (int i=0; i<3; i++) {
        for (int j=0; j<3; j++) {
            cout<<"Enter element at position "<<i<<","<<j<<": ";
            cin>>arr[i][j];
        }
    }
}
int main()
{
    // Getting matrices from the user
    int arr1[3][3], arr2[3][3], result[3][3];
    cout<<"Enter 1st Array"<<endl;
    get3x3matrix(arr1);
    cout<<"Enter 2nd Array"<<endl;
    get3x3matrix(arr2);

    // Adding both Matrices
    add3x3matrix(arr1, arr2, result);

    // Printing Final Matrix
    cout<<endl<<"Final Matrix"<<endl;
    for (int i=0; i<3; i++) {
        for (int j=0; j<3; j++) {
            cout<<result[i][j]<<" ";
        }
        cout<<endl;
    }
    return 0;
}
```

```
"C:\Users\Hp\Downloads\Documents\NUST Content\Semester 1\Computer Systems & Programming Lab\week 11\week11\bin\Debu...
Enter 1st Array
Enter element at position 0,0: 1
Enter element at position 0,1: 2
Enter element at position 0,2: 3
Enter element at position 1,0: 1
Enter element at position 1,1: 2
Enter element at position 1,2: 3
Enter element at position 2,0: 1
Enter element at position 2,1: 2
Enter element at position 2,2: 3
Enter 2nd Array
Enter element at position 0,0: 4
Enter element at position 0,1: 5
Enter element at position 0,2: 7
Enter element at position 1,0: 3
Enter element at position 1,1: 5
Enter element at position 1,2: 8
Enter element at position 2,0: 3
Enter element at position 2,1: 7
Enter element at position 2,2: 1

Final Matrix
5 7 10
4 7 11
4 9 4

Process returned 0 (0x0)   execution time : 17.390 s
Press any key to continue.
```

TASK 3

```cpp
#include <bits/stdc++.h>
using namespace std;

void transpose3x3(int original[][3], int transpose[][3]) {
    for (int i=0; i<3; i++) {
        for (int j=0; j<3; j++) {
            transpose[j][i] = original[i][j];
        }
    }
}
int main()
{
    int matrix[3][3], transpose[3][3];

    // Getting matrix
    for (int i=0; i<3; i++) {
        for (int j=0; j<3; j++) {
            cout<<"Enter element at position "<<i<<","<<j<<": ";
            cin>>matrix[i][j];
        }
    }
    // Transposing Matrix
    transpose3x3(matrix, transpose);

    //Printing the Transposed Matrix
    cout<<endl<<"Transposed Matrix"<<endl;
    for (int i=0; i<3; i++) {
        for (int j=0; j<3; j++) {
            cout<<transpose[i][j]<<" ";
        }
        cout<<endl;
    }
    return 0;
}
```

```
"C:\Users\Hp\Downloads\Documents\NUST Content\Semester 1\Computer S
Enter element at position 0,0: 1
Enter element at position 0,1: 2
Enter element at position 0,2: 3
Enter element at position 1,0: 4
Enter element at position 1,1: 5
Enter element at position 1,2: 6
Enter element at position 2,0: 7
Enter element at position 2,1: 8
Enter element at position 2,2: 9

Transposed Matrix
1 4 7
2 5 8
3 6 9

Process returned 0 (0x0)   execution time : 7.686 s
Press any key to continue.
```

TASK 4

```cpp
#include <bits/stdc++.h>
using namespace std;

void multiply3x3(int arr1[][3], int arr2[][3], int result[][3]) {
    int sum;
    for (int i=0; i<3; i++) {
        for (int j=0; j<3; j++) {
            sum = 0;
            for (int k=0; k<3; k++) {
                sum += arr1[i][k]*arr2[k][j];
            }
            result[i][j] = sum;
        }}}
void get3x3matrix(int arr[][3]){
    for (int i=0; i<3; i++) {
        for (int j=0; j<3; j++) {
            cout<<"Enter element at position "<<i<<","<<j<<": ";
            cin>>arr[i][j];
        }}}
int main()
{
    int arr1[3][3], arr2[3][3], result[3][3];
    // Get two 3x3 matrices from the user
    cout<<"Enter 1st Matrix"<<endl;
    get3x3matrix(arr1);
    cout<<"Enter 2nd matrix"<<endl;
    get3x3matrix(arr2);
    // Multiply both matrices
    multiply3x3(arr1, arr2, result);
    // Printing Final Matrix
    cout<<endl<<"Final Matrix"<<endl;
    for (int i=0; i<3; i++) {
        for (int j=0; j<3; j++) {
            cout<<result[i][j]<<" ";
        }
        cout<<endl;
    }
    return 0;
}
```

```
"C:\Users\Hp\Downloads\Documents\NUST Content\Semester 1\Computer Systems & Programming Lab\week 11\week11\bin\De
Enter 1st Matrix
Enter element at position 0,0: 2
Enter element at position 0,1: 4
Enter element at position 0,2: 2
Enter element at position 1,0: 5
Enter element at position 1,1: 3
Enter element at position 1,2: 8
Enter element at position 2,0: 3
Enter element at position 2,1: 33
Enter element at position 2,2: 8
Enter 2nd matrix
Enter element at position 0,0: 2
Enter element at position 0,1: 5
Enter element at position 0,2: 3
Enter element at position 1,0: 63
Enter element at position 1,1: 2
Enter element at position 1,2: 35
Enter element at position 2,0: 7
Enter element at position 2,1: 9
Enter element at position 2,2: 1

Final Matrix
270 36 148
255 103 128
2141 153 1172

Process returned 0 (0x0)   execution time : 17.211 s
Press any key to continue.
```

TASK 5

```cpp
#include <bits/stdc++.h>
using namespace std;

int table(int num, int mult) {
    if (mult==11)
        return 0;

    cout<<num<<" x "<<mult<<" = "<<num*mult<<endl;
    return table(num, mult+1);
}

int main()
{
    int num;
    cout<<"Enter the number for the table: ";
    cin>>num;

    table(num, 1);

    return 0;
}
/*
```