

LAB 9 FOP: -

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|---------|--------------------------|
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| SECTION | A |

TASK 1: -

```
#include <iostream>

using namespace std;

int main() {

    const int rows = 3;

    const int cols = 3;

    int matrix[rows][cols];

    cout << "Enter elements for the 3x3 matrix:" << endl;

    for (int i = 0; i < rows; ++i) {

        for (int j = 0; j < cols; ++j) {

            cout << "Enter element at position (" << i + 1 << ", " << j + 1 << "): ";

            cin >> matrix[i][j];

        }

    }

    cout << "Required matrix is : "<<endl;

    for (int i = 0; i < rows; i++) {

        for (int j = 0; j < cols; j++) {

            cout << matrix[i][j] << " ";

        }

        cout << endl;

    }

    int leftDiagonalSum = 0;

    for (int i = 0; i < rows; i++) {

        leftDiagonalSum += matrix[i][i];

    }

    int rightDiagonalSum = 0;

    for (int i = 0; i < rows; i++) {

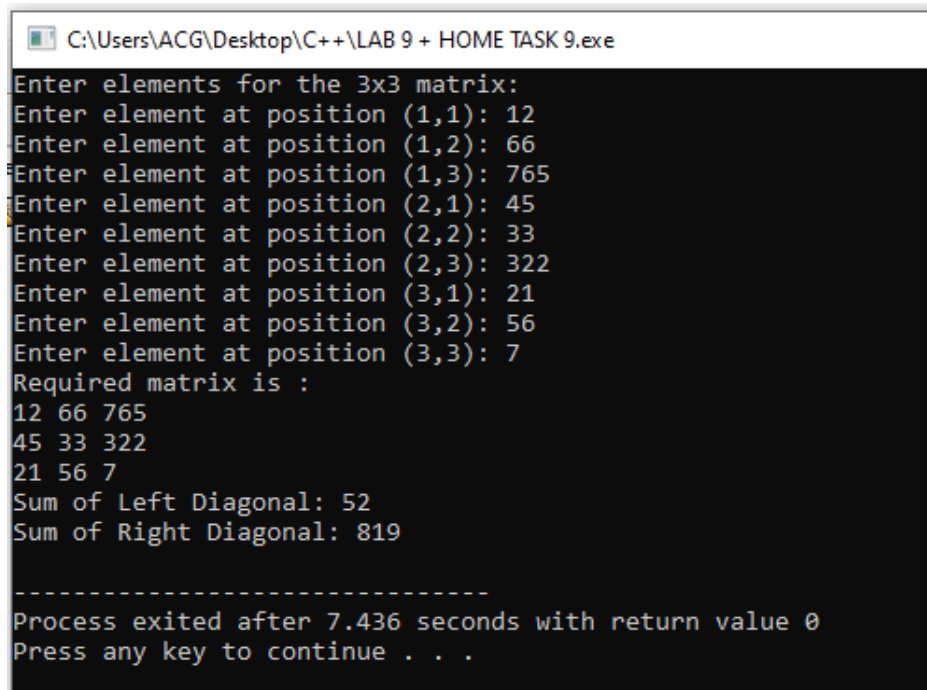
        rightDiagonalSum += matrix[i][rows - 1 - i];

    }

    cout << "Sum of Left Diagonal: " << leftDiagonalSum << endl;

    cout << "Sum of Right Diagonal: " << rightDiagonalSum << endl;
```

```
return 0;
}
```



```
C:\Users\ACG\Desktop\C++\LAB 9 + HOME TASK 9.exe
Enter elements for the 3x3 matrix:
Enter element at position (1,1): 12
Enter element at position (1,2): 66
Enter element at position (1,3): 765
Enter element at position (2,1): 45
Enter element at position (2,2): 33
Enter element at position (2,3): 322
Enter element at position (3,1): 21
Enter element at position (3,2): 56
Enter element at position (3,3): 7
Required matrix is :
12 66 765
45 33 322
21 56 7
Sum of Left Diagonal: 52
Sum of Right Diagonal: 819

-----
Process exited after 7.436 seconds with return value 0
Press any key to continue . . .
```

TASK 2: -

```
#include <iostream>

using namespace std;

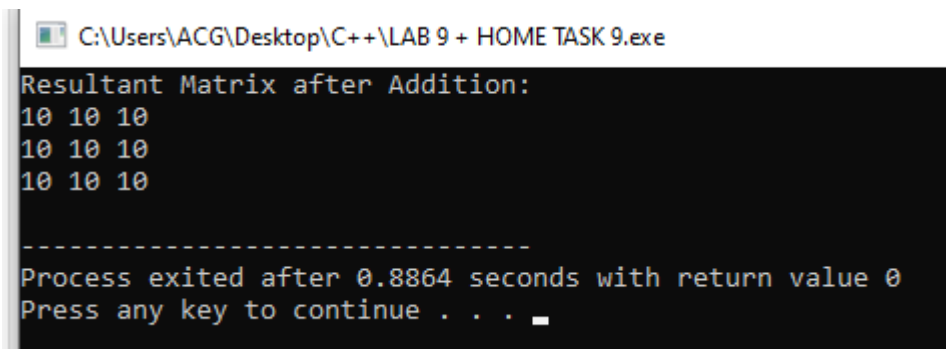
void addMatrices(const int matrix1[3][3], const int matrix2[3][3], int result[3][3]) {
    for (int i = 0; i < 3; i++) {
        for (int j = 0; j < 3; j++) {
            result[i][j] = matrix1[i][j] + matrix2[i][j];
        }
    }
}

int main() {
    const int rows = 3;
    const int cols = 3;

    int matrix1[rows][cols] = {{1, 2, 3},
```

```
        {4, 5, 6},  
        {7, 8, 9}};
```

```
int matrix2[rows][cols] = {{9, 8, 7},  
                           {6, 5, 4},  
                           {3, 2, 1}};  
  
int result[rows][cols];  
addMatrices(matrix1, matrix2, result);  
cout << "Resultant Matrix after Addition:\n";  
for (int i = 0; i < rows; i++) {  
    for (int j = 0; j < cols; j++) {  
        cout << result[i][j] << " ";  
    }  
    cout << endl;  
}  
return 0;  
}
```



The screenshot shows a Windows command prompt window titled "C:\Users\ACG\Desktop\C++\LAB 9 + HOME TASK 9.exe". The output of the program is displayed as follows:

```
Resultant Matrix after Addition:  
10 10 10  
10 10 10  
10 10 10  
  
-----  
Process exited after 0.8864 seconds with return value 0  
Press any key to continue . . .
```

TASK 3: -

```
void transposeMatrix(const int matrix[3][3], int result[3][3]) {  
    for (int i = 0; i < 3; ++i) {  
        for (int j = 0; j < 3; ++j) {
```

```

        result[i][j] = matrix[j][i];
    }
}

int main() {
    int matrix[3][3] = {{1, 2, 3},
                        {4, 5, 6},
                        {7, 8, 9}};

    int transposeMatrixResult[3][3];
    transposeMatrix(matrix, transposeMatrixResult);
    std::cout << "Original Matrix:" << std::endl;
    for (int i = 0; i < 3; ++i) {
        for (int j = 0; j < 3; ++j) {
            std::cout << matrix[i][j] << " ";
        }
        std::cout << std::endl;
    }
    std::cout << "Transposed Matrix:" << std::endl;
    for (int i = 0; i < 3; ++i) {
        for (int j = 0; j < 3; ++j) {
            std::cout << transposeMatrixResult[i][j] << " ";
        }
        std::cout << std::endl;
    }
    return 0;
}

```

```
C:\Users\ACG\Desktop\C++\LAB 9 + HOME TASK 9.exe
Original Matrix:
1 2 3
4 5 6
7 8 9
Transposed Matrix:
1 4 7
2 5 8
3 6 9

-----
Process exited after 0.6346 seconds with return value 0
Press any key to continue . . .
```

TASK 4: -

```
#include <iostream>

using namespace std;

void inputMatrix(int matrix[3][3]) {

    std::cout << "Enter the elements of the matrix (row-wise):" << std::endl;

    for (int i = 0; i < 3; ++i) {

        for (int j = 0; j < 3; ++j) {

            std::cout << "Enter element at position (" << i + 1 << ", " << j + 1 << "): ";

            std::cin >> matrix[i][j];

        }

    }

}

void multiplyMatrices(const int matrix1[3][3], const int matrix2[3][3], int result[3][3]) {

    for (int i = 0; i < 3; ++i) {

        for (int j = 0; j < 3; ++j) {

            result[i][j] = 0;

            for (int k = 0; k < 3; ++k) {

                result[i][j] += matrix1[i][k] * matrix2[k][j];

            }

        }

    }

}
```

```
}
```

```
int main() {  
    int matrix1[3][3], matrix2[3][3], resultMatrix[3][3];  
    std::cout << "Input for Matrix 1:\n";  
    inputMatrix(matrix1);  
  
    std::cout << "\nInput for Matrix 2:\n";  
    inputMatrix(matrix2);  
    multiplyMatrices(matrix1, matrix2, resultMatrix);  
    std::cout << "\nMatrix 1:\n";  
    for (int i = 0; i < 3; ++i) {  
        for (int j = 0; j < 3; ++j) {  
            std::cout << matrix1[i][j] << " ";  
        }  
        std::cout << std::endl;  
    }  
  
    std::cout << "\nMatrix 2:\n";  
    for (int i = 0; i < 3; ++i) {  
        for (int j = 0; j < 3; ++j) {  
            std::cout << matrix2[i][j] << " ";  
        }  
        std::cout << std::endl;  
    }  
  
    std::cout << "\nResult Matrix:\n";  
    for (int i = 0; i < 3; ++i) {  
        for (int j = 0; j < 3; ++j) {  
            std::cout << resultMatrix[i][j] << " ";  
        }  
    }  
}
```

```

    }

    std::cout << std::endl;

}

return 0;

}

```

```

C:\Users\ACG\Desktop\C++\LAB 9 + HOME TASK 9.exe
Input for Matrix 1:
Enter the elements of the matrix (row-wise):
Enter element at position (1, 1): 23
Enter element at position (1, 2): 12
Enter element at position (1, 3): 45
Enter element at position (2, 1): 67
Enter element at position (2, 2): 88
Enter element at position (2, 3): 76
Enter element at position (3, 1): 54
Enter element at position (3, 2): 33
Enter element at position (3, 3): 22

Input for Matrix 2:
Enter the elements of the matrix (row-wise):
Enter element at position (1, 1): 11
Enter element at position (1, 2): 23
Enter element at position (1, 3): 45
Enter element at position (2, 1): 67
Enter element at position (2, 2): 88
Enter element at position (2, 3): 654
Enter element at position (3, 1): 33
Enter element at position (3, 2): 22
Enter element at position (3, 3): 12

Matrix 1:
23 12 45
67 88 76
54 33 22

Matrix 2:
11 23 45
67 88 654
33 22 12

Result Matrix:
2542 2575 9423
9141 10957 61479
3531 4630 24276

-----
Process exited after 20.1 seconds with return value 0
Press any key to continue . . .

```