

## LAB TASKS

### **TASK 01**

```
#include <iostream>

using namespace std;

int main()
{
    int mat[3][3];
    int sum = 0;
    for (int i = 0; i < 3; i++)
    {
        cout << "Enter data for row " << i + 1 << endl;
        for (int j = 0; j < 3; j++)
        {
            cin >> mat[i][j];
        }
    }

    cout << "The resultant matrix\n";
    for (int m = 0; m < 3; m++)
    {
        for (int n = 0; n < 3; n++)
        {
            cout << mat[m][n] << " ";
        }
        cout << endl;
    }

    for (int k = 0; k < 3; k++)
    {
        sum += mat[k][k];
    }
}
```

```

}

cout << "The sum of the right diagonal is " << sum << endl;

sum = 0;

for (int z = 2; z >= 0; z--)
{
    sum += mat[2-z][z];
}

cout << "The sum of the left diagonal is " << sum;

return 0;}

```

## TASK 02

```

#include <iostream>

using namespace std;

int result(int a[3][3], int b[3][3])
{
    int sum[3][3];

    for (int i = 0; i < 3; i++)
    {
        for (int j = 0; j < 3; j++)
        {
            sum[i][j] = a[i][j] + b[i][j];
        }
    }

    cout << "The resultant matrix after addition is: " << endl;

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

```

```
cout << sum[i][j]<<" ";
}
cout << endl;
}
return 0;
}
int main()
{
int num = 0;
int mat1[3][3];
int mat2[3][3];
cout << "Enter the data for matrix number one\n";
for (int i = 0; i < 3;i++)
{
cout << "Enter data for row " << i + 1 << endl;
for (int j = 0; j < 3;j++)
{
cin >> mat1[i][j];
}
}
cout << "The resultant matrix\n";
for (int m = 0; m < 3; m++)
{
for (int n = 0;n < 3; n++)
{
cout << mat1[m][n]<<" ";
}
cout << endl;
}
```

```

cout << "Enter the data for matrix number two\n";
for (int i = 0; i < 3;i++)
{
cout << "Enter data for row " << i + 1 << endl;
for (int j = 0; j < 3;j++)
{
cin >> mat2[i][j];
}
}
cout << "The resultant matrix\n";
for (int m = 0; m < 3; m++)
{
for (int n = 0;n < 3; n++)
{
cout << mat2[m][n] << " ";
}
cout << endl;
}
result(mat1, mat2);
return 0;
}

```

### TASK 3

```

#include <iostream>

using namespace std;

int transpose(int a[3][3])
{
int result[3][3];

```

```

for (int i = 0; i < 3; i++)
{
for (int j = 0; j < 3; j++)
{
result[j][i] = a[i][j];
}
}

cout << "While the transpose of the matrix is: " << endl;

for (int i = 0; i < 3; i++)
{
for (int j = 0; j < 3; j++)
{
cout << result[i][j] << " ";
}
cout << "\n";
}

return 0;
}

int main()
{
int mat[3][3];

for (int i = 0; i < 3; i++)
{
cout << "Enter data of row " << i + 1 << endl;

for (int j = 0; j < 3; j++)
{
cin >> mat[i][j];
}
}
}

```

```

cout << "The resultant matrix is " << endl;
for (int i = 0; i < 3; i++)
{
    for (int j = 0; j < 3; j++)
    {
        cout << mat[i][j] << " ";
    }
    cout << endl;
}
cout << endl;
transpose(mat);
return 0;
}

```

## TASK 04

```

#include <iostream>

using namespace std;

int multiply(int a[2][2], int b[2][2])
{
    int result[2][2] = { 0 };
    for (int i = 0; i < 2; i++)
    {
        for (int j = 0; j < 2; j++)
        {
            for (int k = 0; k < 2; k++)
            {
                result[i][j] += a[i][k] * b[k][j];
            }
        }
    }
}

```

```

    }
}

cout << "The result of multiplication is: " << endl;
for (int i = 0; i < 2; i++)
{
    for (int j = 0; j < 2; j++)
    {
        cout << result[i][j] << " ";
    }
    cout << endl;
}

return 0;
}

int main()
{
    int mat1[2][2];
    cout << "Enter data for matrix 1\n";
    for (int i = 0; i < 2; i++)
    {
        cout << "Enter data of row " << i + 1 << endl;
        for (int j = 0; j < 2; j++)
        {
            cin >> mat1[i][j];
        }
    }

    cout << "The resultant matrix is " << endl;
    for (int i = 0; i < 2; i++)
    {
        for (int j = 0; j < 2; j++)

```

```

{
cout<< mat1[i][j]<<" ";
}
cout << endl;
}
cout << endl;
int mat2[2][2];
cout << "Enter data for matrix 2\n";
for (int i = 0; i < 2;i++)
{
cout << "Enter data of row " << i + 1 << endl;
for (int j = 0; j < 2; j++)
{
cin >> mat2[i][j];
}
}
cout << "The resultant matrix is " << endl;
for (int i = 0; i < 2;i++)
{
for (int j = 0; j < 2; j++)
{
cout << mat2[i][j] << " ";
}
cout << endl;
}
cout << endl;
multiply(mat1, mat2);
return 0;
}

```



## TASK 05

```
#include <iostream>

using namespace std;

int table(int num, int i)
{
    if (i <= 10)
    {
        cout << num << "*" << i << "=" << num * i << endl;
        return table(num, i + 1);
    }
    else
    {
        return 1;
    }
}

int main()
{
    table(15, 1);
    return 0;}
```

## HOME TASK

```
#include <iostream>

using namespace std;

int Determinant(int a[2][2])
{
    return (a[0][0] * a[1][1]) - (a[0][1] * a[1][0]);
}
```

```

}

int Adjoint(int b[2][2])
{
    int temp = 0;
    temp = b[0][0];
    b[0][0] = b[1][1];
    b[1][1] = temp;
    temp = -b[0][1];
    b[0][1] = -b[1][0];
    b[1][0] = temp;
    return 0;
}

int Inverse(int a[2][2])
{
    cout << "The inverse is :" << endl;
    cout << 1 << "/" << Determinant(a) << " multiplied by the matrix :" << endl;
    for (int i = 0; i < 2; i++)
    {
        for (int j = 0; j < 2; j++)
        {
            cout << a[i][j] << " ";
        }
        cout << endl;
    }
    return 0;
}

int InputMatrix(int b[2][2])
{
    for (int i = 0; i < 2; i++)

```

```

{
cout << "Enter data for row " << i + 1 << endl;
for (int j = 0; j < 2; j++)
{
cin >> b[i][j];
}
}
return 0;
}

int main()
{
int mat[2][2];
InputMatrix(mat);
cout << "The input matrix :" << endl;
for (int i = 0; i < 2; i++)
{
for (int j = 0; j < 2; j++)
{
cout << mat[i][j] << " ";
}
cout << endl;
}
Determinant(mat);
Adjoint(mat);
Inverse(mat);
return 0;
}}

```