

Lab Manual 09

Lab task submission

Task 01

```
#include <iostream> using
namespace std;

int main()
{
    int i,j,k;      int
array[3][3];  int
sum1(0),sum2(0);
cout<<"enter elements\n";
for(i=0;i<3;i++){
    for(j=0;j<3;j++){
        cin>>array[i][j];
    }
}
cout<<"your array is \n";
    for(i=0;i<3;i++){
for(j=0;j<3;j++){
        cout<<array[i][j];

    }
    cout<<endl;
}

    cout<<"left diagonal \n";
for(i=0;i<3;i++){
    for(j=0;j<3;j++){
        if(i==j){
```

```

        cout<<array[i][j]<<endl;

sum2+=array[i][j];

    }

}

}

cout<<"right diagonal \n";
for(i=0;i<3;i++){
    for(j=0;j<3;j++){
        if(i*j==1){
            cout<<array[i][j]<<endl;

            sum1=sum1+array[i][j];
        }
        else if(i-j==2){
cout<<array[i][j]<<endl;
sum1=sum1+array[i][j];
        }
        else if(i-j==-2){
cout<<array[i][j]<<endl;
sum1=sum1+array[i][j];
        }
    }
}

cout<<"sum of right diagonal = "<<sum1<<endl;
cout<<"sum of left diagonal = "<<sum2;

}

```

```
C:\Users\TALHA SANGRASI\O x + v
enter elements
1
2
3
4
5
6
7
8
9
your array is
123
456
789
left diagonal
1
5
9
right diagonal
3
5
7
sum of right diagonal = 15
sum of left diagonal = 15
-----
Process exited after 6.206 seconds with return value 0
Press any key to continue . . . |
```

Task 02

```
#include <iostream> using
```

```
namespace std;
```

```
int sum_of_matrices(int array1[3][3],int array2[3][3]){
```

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

```
j=0;j<3;j++){        int sum=
```

```
array1[i][j]+array2[i][j];
```

```
        cout<<sum<<" ";
```

```
    }
```

```
    cout<<endl;
```

```

    }
}

int main()
{
    int array1[3][3];    int array2[3][3];
    int i,j,k,l,sum(0);    cout<<"enter elements for
first matrix\n";    for(i=0;i<3;i++){
for(j=0;j<3;j++){
        cin>>array1[i][j];
    }
}
    cout<<"enter elements for second matrix\n";
for(i=0;i<3;i++){    for(j=0;j<3;j++){
        cin>>array2[i][j];
    }
}
    cout<<"first matrix\n";
for(i=0;i<3;i++){    for(j=0;j<3;j++){
        cout<<array1[i][j]<<" ";
    }
    cout<<endl;
}cout<<"second matrix\n";
for(i=0;i<3;i++){ for(j=0;j<3;j++){

        cout<<array2[i][j]<<" ";

    }
    cout<<endl;
}
}

```

```
cout<<endl;

cout<<"sum of matrices = \n";
```

```
sum_of_matrices( array1, array2);

}
```

```
enter elements for first matrix
1
2
3
4
5
6
7
8
9
enter elements for second matrix
9
8
7
6
5
4
3
2
1
first matrix
1 2 3
4 5 6
7 8 9
second matrix
9 8 7
6 5 4
3 2 1

sum of matrices =
10 10 10
10 10 10
10 10 10
```

Task 03

```
#include <iostream> using
```

```
namespace std;
```

```
int transpose(int array[3][3],int array0[3][3]){
```

```

        for(int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                cout<<array0[i][j]<<" ";

            }
            cout<<endl;
        }
    }
}

```

```

int main()
{
    int array[3][3];
    int array0[3][3]={0,0,0,0,0,0,0,0,0};
    int i,j,k(0);

    cout<<"enter elements\n";
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            cin>>array[i][j];
        }
    }

    cout<<"your matrix is \n";
    for(i=0;i<3;i++){
        for(j=0;j<3;j++){
            cout<<array[i][j]<<" ";
        }
        cout<<endl;
    }

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

```

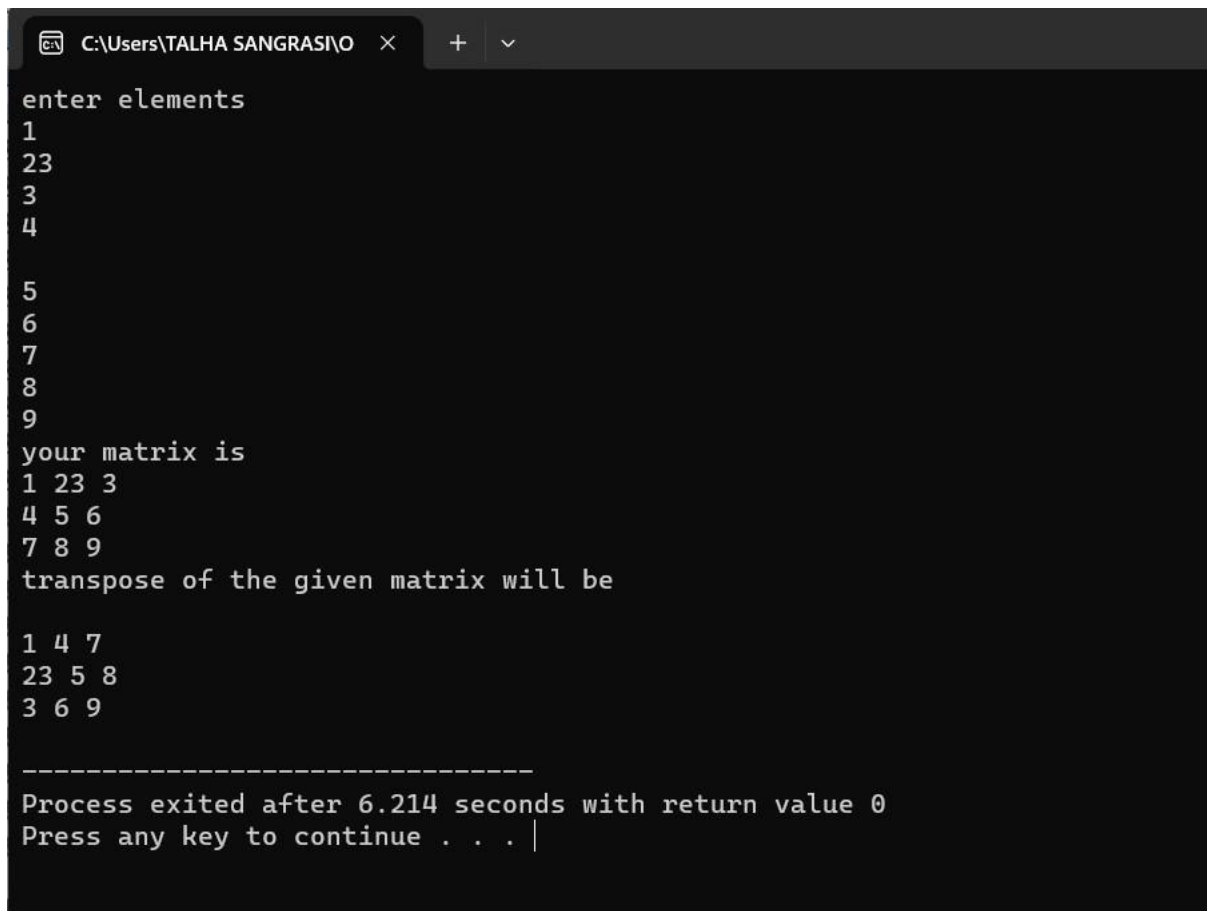
```

        array0[i][j]=array[j][i];
    }
}

cout<<"transpose of the given matrix will be \n"<<endl;

transpose(array,array0);
}

```



```

C:\Users\TALHA SANGRASI\O x + v
enter elements
1
23
3
4
5
6
7
8
9
your matrix is
1 23 3
4 5 6
7 8 9
transpose of the given matrix will be

1 4 7
23 5 8
3 6 9

-----
Process exited after 6.214 seconds with return value 0
Press any key to continue . . . |

```

Task 04

```

#include <iostream> using
namespace std;

```

```

void multiply_matrices(int array1[3][3], int array2[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] += array1[i][k] * array2[k][j];
        }

        cout << result[i][j] << " ";
    }
    cout << endl;
}
}

```

```

int main() {    int
array1[3][3];    int
array2[3][3];

    cout << "Enter elements for first matrix:\n";
    for (int i = 0; i < 3; i++) {
    for (int j = 0; j < 3; j++) {
    cin >> array1[i][j];

        }
    }

    cout << "Enter elements for second matrix:\n";

```



```
    for (int i = 0; i < 3; i++) {  
for (int j = 0; j < 3; j++) {  
cin >> array2[i][j];  
    }  
}
```

```
    cout << "First matrix:\n";  
    for (int i = 0; i < 3; i++) {  
for (int j = 0; j < 3; j++) {  
cout << array1[i][j] << " ";  
    }  
    cout << endl;  
}
```

```
    cout << "Second matrix:\n";  
    for (int i = 0; i < 3; i++) {  
for (int j = 0; j < 3; j++) {  
cout << array2[i][j] << " ";  
    }  
    cout << endl;  
}
```

```
    cout << endl;    cout << "Product  
of matrices:\n";  
multiply_matrices(array1, array2);  
  
    return 0;  
}
```

```
C:\Users\TALHA SANGRASI\O X + v
Enter elements for first matrix:
1
2
3
4
5
6
7
8
9
Enter elements for second matrix:
9
8
7
6
5
4
3
2
1
First matrix:
1 2 3
4 5 6
7 8 9
Second matrix:
9 8 7
6 5 4
3 2 1

Product of matrices:
30 24 18
84 69 54
138 114 90

-----
Process exited after 23.77 seconds with return value 0
Press any key to continue . . . |
```

Task 05

```
#include <iostream> using
namespace std;
```

```

void Table(int n, int m) {   if (m <= 10) {       cout <<
n << " * " << m << " = " << n * m << endl;

    Table(n, m + 1);

    }
}

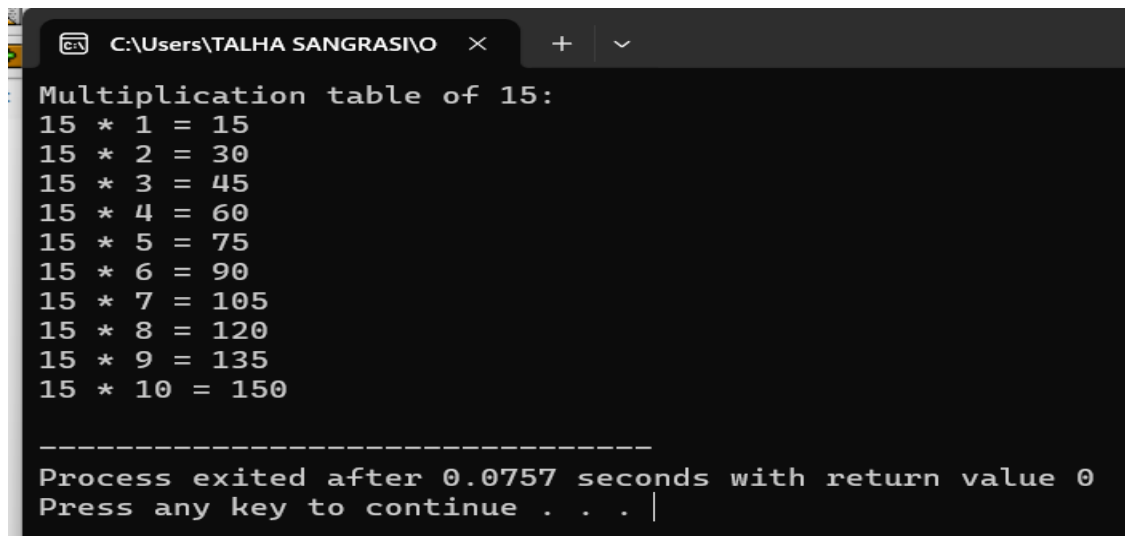
int main() {   int
number = 15;

    cout << "Multiplication table of " << number << ":\n";

    Table(number, 1);

    return 0;
}

```



```

C:\Users\TALHA SANGRASI\O
Multiplication table of 15:
15 * 1 = 15
15 * 2 = 30
15 * 3 = 45
15 * 4 = 60
15 * 5 = 75
15 * 6 = 90
15 * 7 = 105
15 * 8 = 120
15 * 9 = 135
15 * 10 = 150

-----
Process exited after 0.0757 seconds with return value 0
Press any key to continue . . . |

```

Home task submission

Task 01

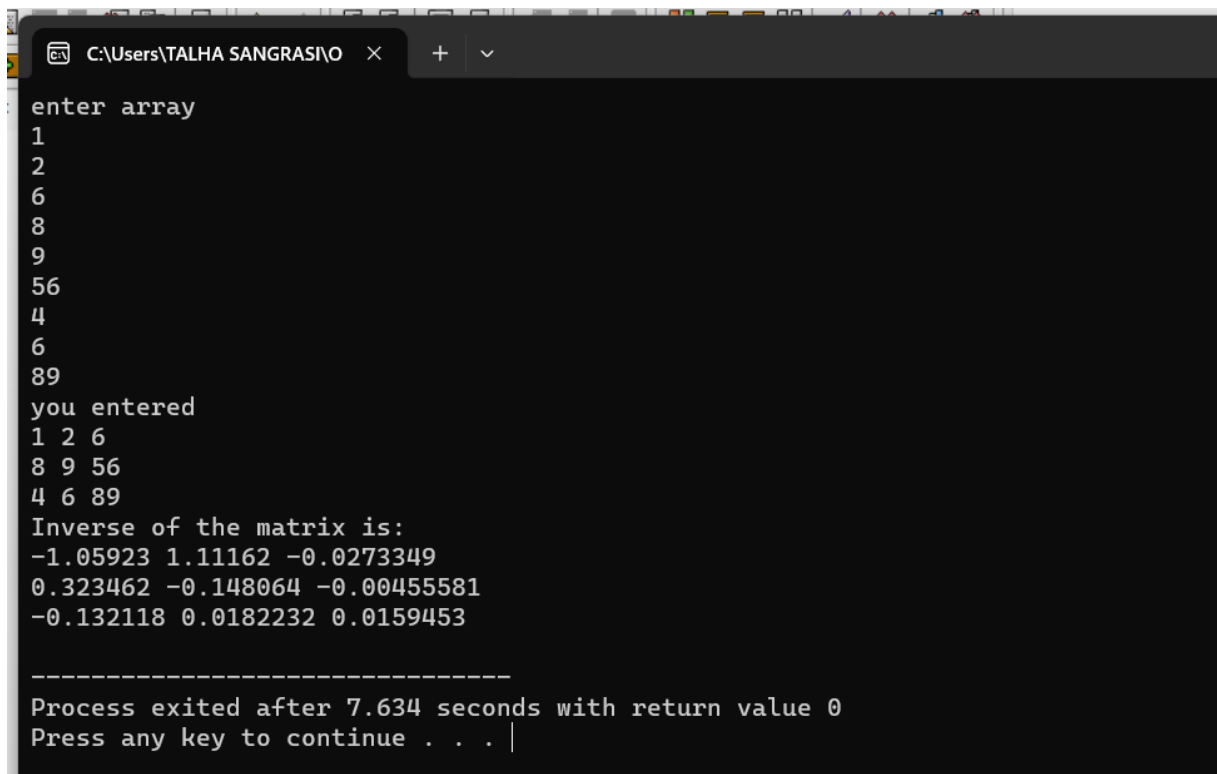
```
#include <iostream>
using namespace std;
int main()
{
    int i,j;
    double array[3][3];
    cout<<"enter array\n";
    for (i=0;i<3;i++){
        for(j=0;j<3;j++){
            cin>>array[i][j];
        }
    }
    cout<<"you entered \n";
    for (i=0;i<3;i++){
        for(j=0;j<3;j++){
            cout<<array[i][j]<<" ";
        }
        cout<<endl;
    }

    double det=array[0][0] * (array[1][1] * array[2][2] - array[2][1] * array[1][2]) -
array[0][1] * (array[1][0] * array[2][2] - array[2][0] * array[1][2]) +
array[0][2] * (array[1][0] * array[2][1] - array[2][0] * array[1][1]);
    double adj[3][3];
    adj[0][0] = array[1][1] * array[2][2] - array[2][1] * array[1][2];
    adj[0][1] = -(array[1][0] * array[2][2] - array[2][0] * array[1][2]);
    adj[0][2] = array[1][0] * array[2][1] - array[2][0] * array[1][1];
    adj[1][0] = -(array[0][1] * array[2][2] - array[2][1] * array[0][2]);
    adj[1][1] = array[0][0] * array[2][2] - array[2][0] * array[0][2];
    adj[1][2] = -(array[0][0] * array[2][1] - array[2][0] * array[0][1]);
    adj[2][0] = array[0][1] * array[1][2] - array[1][1] * array[0][2];
    adj[2][1] = -(array[0][0] * array[1][2] - array[1][0] * array[0][2]);
    adj[2][2] = array[0][0] * array[1][1] - array[1][0] * array[0][1];
    if (det == 0) {
        cout << "The matrix is singular" <<endl;
    }
    else{
        double inv[3][3];
        for (int i = 0; i < 3; i++) {
            for (int j = 0; j < 3; j++) {
```

```

        inv[i][j] = adj[i][j] / det;
    }
}
cout << "Inverse of the matrix is:" << endl;
    for (int i = 0; i < 3; ++i) {
        for (int j = 0; j < 3; ++j) {
            cout << inv[i][j] << " ";
        }
        cout << endl;
    }
}
}
}

```



```

C:\Users\TALHA SANGRASI\O
enter array
1
2
6
8
9
56
4
6
89
you entered
1 2 6
8 9 56
4 6 89
Inverse of the matrix is:
-1.05923 1.11162 -0.0273349
0.323462 -0.148064 -0.00455581
-0.132118 0.0182232 0.0159453

-----
Process exited after 7.634 seconds with return value 0
Press any key to continue . . .

```