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LAB MANUAL 9

TASK 1:

```cpp
#include<iostream>
using namespace std;
int main(){
    int matrix[3][3];

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

        cout<<"Enter the elements of matrix"<< i+1<< " ,"<<j+1<<endl;
    cin>> matrix[i][j];

        }
           cout<<endl;

    }
    int leftdiagonal =0;

    for(int i=0;i<3;i++){
         leftdiagonal += matrix[i][i];}
        cout<<"sum of left diagonal"<<endl;
        cout<<leftdiagonal<<endl;

    int rightdiagonal = 0;
    for( int j=0;j<3;j++){
        rightdiagonal+= matrix[j][2-j];}
        cout<<" sum of right diagonal"<<endl;
        cout<<rightdiagonal<<endl;
        return 0;


}
```

```
Enter the elements of matrix1 ,1
1
Enter the elements of matrix1 ,2
2
Enter the elements of matrix1 ,3
3

Enter the elements of matrix2 ,1
4
Enter the elements of matrix2 ,2
5
Enter the elements of matrix2 ,3
6

Enter the elements of matrix3 ,1
7
Enter the elements of matrix3 ,2
8
Enter the elements of matrix3 ,3
9

sum of left diagonal
15
 sum of right diagonal
15

--------------------------------
Process exited after 4.559 seconds with return value 0
Press any key to continue . . .
```

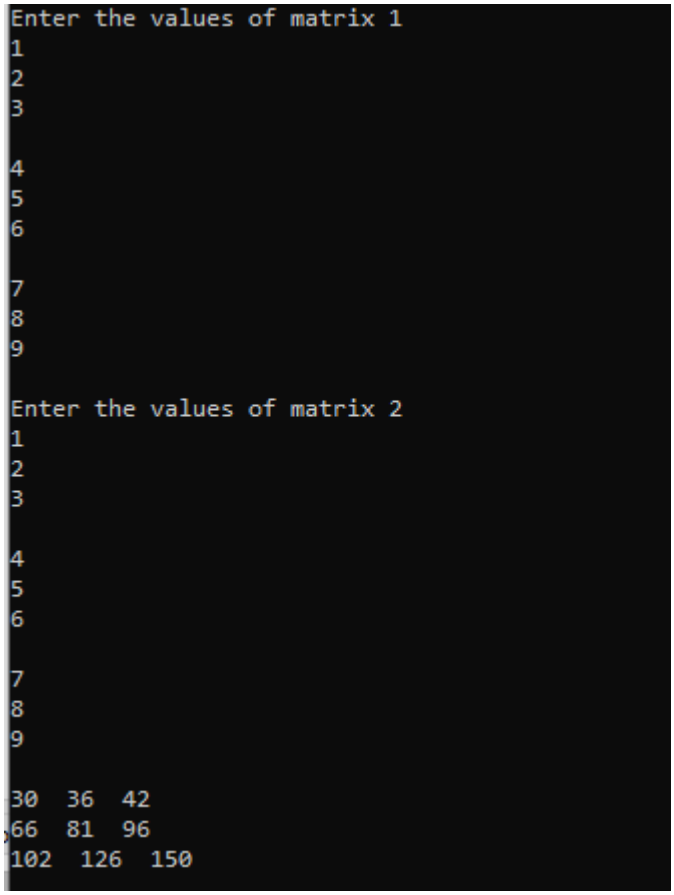
TASK 2

```cpp
#include<iostream>
using namespace std;
void addarrays (int array1[3][3],int array2[3][3], int result[3][3] ){
    for( int i=0;i<=2;i++){
        for( int j=0;j<=2;j++){


            result[i][j]= array1[i][j]+array2[i][j];
            cout<<result[i][j]<<"  ";
        }
    cout<<endl;
    }


}
int main(){
    int array1[3][3];int array2[3][3];int result[3][3];
    cout<<"Enter the values of array1 "<<endl;
    for(int i=0;i<=2;i++)
    {
        for(int j=0;j<=2;j++){

        cin>> array1[i][j];

        }
        cout<<endl;
    }

    cout<<"Enter the values of array2"<<endl;

    for( int i =0;i<=2;i++){
        for( int j=0;j<=2;j++){
            cin>>array2[i][j];}
```

```
3

4
5
6

7
8
9

Enter the values of array2
1
2
3

4
5
6

7
8
9

2  4  6
8  10  12
14  16  18
```

TASK 4:

```
#include<iostream>
using namespace std;
void multiplication( int matrix1[3][3],int matrix2[3][3], int result[3][3] ){
    for( int i=0;i<=2;i++){
        for( int j=0;j<=2;j++){
            result[i][j] =0;
            for( int k=0;k<=2;k++){
        result[i][j]+=matrix1[i][k]*matrix2[k][j];
        }

        }
    }
}
int main(){
    int matrix1[3][3];int matrix2[3][3];int result[3][3];
    cout<<"Enter the values of matrix 1"<<endl;
    for( int i=0;i<=2;i++){

    for( int j=0;j<=2;j++)
    {

        cin>>matrix1[i][j];
    }
    cout<<endl;
}
cout<<"Enter the values of matrix 2"<<endl;
for( int i=0;i<=2;i++)
{
    for( int j=0;j<=2;j++){
        cin>>matrix2[i][j];

    }

cout <<endl;}
multiplication( matrix1,matrix2,result);{

 for( int i=0;i<=2;i++){
    for( int j=0;j<=2;j++)
    {cout<< result[i][j]<<"  ";
     }
     cout<<endl;
 }}}
```


Enter the values of matrix 1
1
2
3
4
5
6
7
8
9
Enter the values of matrix 2
1
2
3
4
5
6
7
8
9
30 36 42
66 81 96
102 126 150

TASK 3

```cpp
#include<iostream>
using namespace std;
void transpose( int array[3][3]){
    int temp;
    for(int i=0;i<=2;i++)
    {
        for( int j=0;j<=2;j++){


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


    }


}
int main(){

     int array[3][3];
     cout<<" Enter the values of array"<<endl;
     for( int i=0;i<=2;i++)
       {
        for(int j=0;j<=2;j++){
            cin>>array[i][j];

        }
        cout<<endl;
       }
       transpose( array);
       for( int i=0;i<=2;i++)
       {
        for( int j=0;j<=2;j++){


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

       } cout<<endl;}



}
```

```
 Enter the values of array
1
2
3

4
5
6

7
8
9

1  4  7
2  5  8
3  6  9

--------------------------------
Process exited after 4.363 seconds with return value 0
Press any key to continue . . .
```

TASK 5

```cpp
#include <iostream>

using namespace std;


void multiplationtable(int mynum, int start) {
    if (start > 10) {
        return;
    }
    else{
    int product=mynum * start;
    cout<<mynum<<"*"<<start<<"="<<product<<endl;
    multiplationtable(mynum,start+1);
    }
    }
int main(){
    int start=0;
    cout << "table of 15 is" << endl;
    multiplationtable(15,start);
    return 0;
}
```

```
table of 15 is
15*0=0
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
```

HOME TASK

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

double determinant(int array[3][3], int row, int col) {
    return array[(row + 1) % 3][(col + 1) % 3] * array[(row + 2) % 3][(col + 2) % 3]
     - array[(row + 1) % 3][(col + 2) % 3] * array[(row + 2) % 3][(col + 1) % 3];
}

double calcDeterminant(int array[3][3]) {
    double det = 0.0;
    for (int i = 0; i < 3; ++i) {
        det += array[0][i] * determinant(array, 0, i);
    }
    return det;
}

void adjoint(int array[3][3], double adj[3][3]) {
    for (int i = 0; i < 3; ++i) {
        for (int j = 0; j < 3; ++j) {
            adj[j][i] = determinant(array, i, j);
            if ((i + j) % 2 != 0)
                adj[j][i] = -adj[j][i];
        }
    }
}

bool inversemyarray(int array[3][3], double inv[3][3]) {
    double det = calcDeterminant(array);
    if (det == 0) {
        cout << "array is singular, inverse does not exist." << endl;
        return false;
    }

    double adj[3][3];
    adjoint(array, adj);

    for (int i = 0; i < 3; ++i) {
        for (int j = 0; j < 3; ++j) {
            inv[i][j] = adj[i][j] / det;
        }
    }
    return true;
}

void displaymyarray(double array[3][3]) {
    for (int i = 0; i < 3; ++i) {
        for (int j = 0; j < 3; ++j) {
            cout << array[i][j] << " ";
        }
        cout << endl;
```

```
Inverse of the array is:
0.166667 0.333333 0.166667
0.333333 -2.33333 -1.66667
0.166667 -2.33333 -1.5

Process returned 0 (0x0)   execution time : 0.078 s
Press any key to continue.
```