

## fop lab manual 9:

lab task 1:

```
#include <bits/stdc++.h>
using namespace std;
int main(){
    int matrix[3][3], sumld=0, sumrd=0;
    cout<<"Input 9 integers "<<endl;
    for(int i=0; i<3; i++){
        for(int j=0; j<3; j++){
            cin>>matrix[i][j];
        }
    }
    cout<<"The values of matrix are : "<<endl;
    for(int i=0; i<3; i++){
        cout<<"| ";
        for(int j=0; j<3; j++){
            cout<<matrix[i][j]<<" ";
        }
        cout<<"|"<<endl;
    }
    int j=2;
    for(int i=0; i<3; i++){
        sumld+=matrix[i][i];
        sumrd+=matrix[j][i];
        j--;
    }
    cout<<"Sum of left diagonal = "<<sumld<<endl;
    cout<<"Sum of right diagonal= "<<sumrd<<endl;

    return 0;
}
```

<pre> int main(){     int matrix[3][3], sumld=0, sumrd=0;     cout&lt;&lt;"Input 9 integers "&lt;&lt;endl;     for(int i=0; i&lt;3; i++){         for(int j=0; j&lt;3; j++){             cin&gt;&gt;matrix[i][j];         }     }     cout&lt;&lt;"The values of matrix are : "&lt;&lt;endl;     for(int i=0; i&lt;3; i++){         cout&lt;&lt;"  ";         for(int j=0; j&lt;3; j++){             cout&lt;&lt;matrix[i][j]&lt;&lt;" ";         }         cout&lt;&lt;"  "&lt;&lt;endl;     }     int j=2;     for(int i=0; i&lt;3; i++){         sumld+=matrix[i][i];         sumrd+=matrix[j][i];         j--;     }     cout&lt;&lt;"Sum of left diagonal = "&lt;&lt;sumld&lt;&lt;endl;     cout&lt;&lt;"Sum of right diagonal= "&lt;&lt;sumrd&lt;&lt;endl; } </pre>	<pre> /tmp/AqANRiXnc3.o Input 9 integers 4 4 3 6 8 3 5 1 2 8 The values of matrix are :   4 4 3     6 8 3     5 1 8   Sum of left diagonal = 20 Sum of right diagonal= 16 4 dash: 2: 4: not found </pre>
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lab task 2:

```

#include<iostream>
using namespace std;

```

```

void addition(int matrix1[3][3],int matrix2[3][3],int sum[3][3]){
    int x,y;
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++){
            sum[i][j]=matrix1[i][j]+matrix2[i][j];
        }
    }
}

```

```

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

    cout<<"enter the elements in the first matrix "<<endl;
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++){
            cin>>array1[i][j];
        }
    }
}

```

```

cout<<"the first entered matrix is "<<endl;
for(int i=0;i<3;i++){
    for(int j=0;j<3;j++){

        cout<<array1[i][j]<<" ";
    }
    cout<<endl;
}

cout<<"enter the elements in the second matrix "<<endl;
for(int i=0;i<3;i++){
    for(int j=0;j<3;j++){
        cin>>array2[i][j];
    }
}
cout<<"the second entered matrix is "<<endl;
for(int i=0;i<3;i++){
    for(int j=0;j<3;j++){

        cout<<array2[i][j]<<" ";
    }
    cout<<endl;
}
addition(array1,array2,result);
cout<<"the sum of the two entered matrix is "<<endl;
for(int i=0;i<3;i++){
    for(int j=0;j<3;j++){
        cout<<result[i][j]<<" ";
    }
    cout<<endl;
}
return 0;
}

```

```

5 1 0
7 2 4
7 7 8
enter the elements in the second matrix
5
4
8
4

8
7
3
6
7
8
4
the second entered matrix is
5 4 4
8 7 6
7 8 4
the sum of the two entered matrix is
8 5 10
15 9 10
14 15 12

```

lab task 3:

```

#include<iostream>
using namespace std;

```

```

void transpose(int array[3][3],int result[3][3]){

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

```

```
}  
}
```

```
int main(){  
    int array1[3][3],result[3][3];  
    cout<<"enter desired elements of 3*3 matrix to find its transpose"<<endl;  
    for(int i=0;i<3;i++){  
        for(int j=0;j<3;j++){  
            cin>>array1[i][j];  
        }  
    }  
    cout<<"the tranpose of given matrix is "<<endl;  
    transpose(array1,result);  
    for(int i=0;i<3;i++){  
        for(int j=0;j<3;j++){  
            cout<<result[i][j]<<" ";  
        }  
        cout<<endl;  
    }  
    return 0;  
}
```

```
/tmp/AqANRiXnc3.o
```

```
enter desired elements of 3*3 matrix to find its transpose
```

```
4
```

```
3
```

```
6
```

```
7
```

```
2
```

```
9
```

```
6
```

```
4
```

```
5
```

```
4
```

```
5
```

```
5
```

```
the tranpose of given matrix is
```

```
4 9 4
```

```
6 6 5
```

```
2 5 5
```

```
|
```

lab task 4:

```
#include<iostream>
```

```
using namespace std;
```

```
void multiply(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++){
```

```
            int sum=0;
```

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

```
                sum+=array1[i][k]*array2[k][j];
```

```
            }
```

```

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

int main(){
    int matrix1[3][3],matrix2[3][3],product[3][3];
    cout<<"enter the elements in the first matrix = "<<endl;
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++){
            cin>>matrix1[i][j];
        }
    }
    cout<<"enter the elements in the second matrix "<<endl;
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++){
            cin>>matrix2[i][j];
        }
    }
    cout<<"the entered first and second matrix respectively are = "<<endl;
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++){
            cout<<matrix1[i][j]<<" ";
        }
        cout<<endl;
    }
    cout<<endl;
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++){
            cout<<matrix2[i][j]<<" ";
        }
        cout<<endl;
    }
    multiply(matrix1,matrix2,product);
    cout<<"the product of the two matrix is = "<<endl;
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++){
            cout<<product[i][j]<<" ";
        }
        cout<<endl;
    }
    return 0;
}

```

```

2
4
1
enter the elements in the second matrix
3
4
6
3
8
4
6
1
4
the entered first and second matrix respectively are =
4 2 6
6 8 5
2 4 1

3 4 6
3 8 4
6 1 4
the product of the two matrix is =
54 38 56
72 93 88
24 41 32

```

lab task 5:

```

#include<iostream>
using namespace std;

void table(int x,int y){

    if(y>10){
        return ;
    }

    cout<<x<<"*"<<y<<" = "<<x*y<<endl;
    return table(x, y+1);

}

```



```

int main(){
    int x=15,y,result;
    cout<<"the table of 15 is "<<endl;
    table(x,y);
    return 0;
}

```

<pre> 1  #include&lt;iostream&gt; 2  using namespace std; 3 4  void table(int x,int y){ 5 6      if(y&gt;10){ 7          return ; 8      } 9      cout&lt;&lt;x&lt;&lt;"*"&lt;&lt;y&lt;&lt;" = "&lt;&lt;x*y&lt;&lt;endl; 10     return table(x, y+1); 11 12 } 13 14 int main(){ 15     int x=15,y,result; 16     cout&lt;&lt;"the table of 15 is "&lt;&lt;endl; 17     table(x,y); 18     return 0; 19 20 } 21 22 23 </pre>	<pre> /tmp/AqANRiXnc3.o the 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 </pre>
---	---

home task 1:

```

#include<iostream>
using namespace std;
int main(){
    int mat1[3][3];
    cout<<"enter the elements in the matrix"<<endl;
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++){
            cin>>mat1[i][j];
        }
    }
    cout<<"entered matrix is "<<endl;
    for(int i=0;i<3;i++){
        for(int j=0;j<3;j++){
            cout<<mat1[i][j]<<" ";
        }
        cout<<endl;
    }
}

```

```

        cout<<"the determinant of the given matrix is "<<" ";
        int det=0;
        for(int i=0;i<3;i++){
            det=det+mat1[0][i]*(mat1[1][(i+1)%3]*mat1[2][(i+2)%3]-mat1[1]
[(i+2)%3]*mat1[2][(i+1)%3]);
        }
        cout<<det<<endl;
        cout<<endl;
        cout<<endl;
        if(det==0){
            cout<<"the inverse is not possible because its determinant is zero
"<<endl;
            return 0;
        }
        cout<<"the adjoint is the matrix is "<<endl;
        for(int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                cout<<((mat1[(j+1)%3][(i+1)%3]*mat1[(j+2)%3][(i+2)%3])-
(mat1[(j+1)%3][(i+2)%3]*mat1[(j+2)%3][(i+1)%3]))<<" ";
            }
            cout<<endl;
        }

        cout<<"the inverse of the given matrix is follows "<<endl;
        cout<<"inverse = adjoint/determinant"<<endl;
        for(int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                cout<<((mat1[(j+1)%3][(i+1)%3]*mat1[(j+2)%3][(i+2)%3])-
(mat1[(j+1)%3][(i+2)%3]*mat1[(j+2)%3][(i+1)%3])/det)<<" ";
            }
            cout<<endl;
        }
        return 0;
    }
}

```

6  
7  
3  
6  
5  
9  
8  
7  
3  
1

entered matrix is

3 4 6

7 6 9

7 3 1

the determinant of the given matrix is 35

the adjoint is the matrix is

-21 14 0

56 -39 15

-21 19 -10

the inverse of the given matrix is follows

inverse = adjoint/determinant

6 18 35