



Fundamental of Programing

Lab Manual # 09

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Section: C



Q1:

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

int main(){

int arr[3][3];
cout<<"Enter the elements of matrix 1 "<<endl;
for(int i=0; i<3;i++){
for(int j=0; j<3; j++){
cin>>arr[i][j];
}
}
for(int i=0; i<3;i++){
for(int j=0; j<3; j++){
cout<<arr[i][j]<<" ";
}
}
cout<<endl;
}
int Lsum=0;
for(int i=0; i<3;i++){
for(int j=0; j<3; j++){
if(i == j){
Lsum = Lsum+arr[i][j];
}
}
}
cout<<"Left diagonal sum = "<<Lsum<<endl;
int Rsum=0;
for(int i=0; i<3;i++){

Rsum = Rsum+arr[i][2-i];
}
cout<<"right diagonal sum = "<<Rsum<<endl;
return 0;
}
```



```

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File Edit Search View Project Execute Tools AStyle Window Help
(globals)
Project Classes Debug Q2.cpp Q1.cpp
int main()
{
    Enter the elements of matrix 1
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    1 2 3
    4 5 6
    7 8 9
    Left diagonal sum = 15
    right diagonal sum = 15
    -----
    Process exited after 8.049 seconds with return value 0
    Press any key to continue . . .
}

Compiler Resource
Alert Compilation
Shorten compiler paths
- Errors: 0
- Warnings: 0
- Output Filename: D:\ME-15\top lab\Lab manual 9\Lab Task\Q1.exe
- Output Size: 1.35762119293213 MiB
- Compilation Time: 2.66s
Line: 25 Col: 10 Sel: 0 Lines: 35 Length: 704 Insert Done parsing in 0.015 seconds
Type here to search USD/RUB -0.94% 5:32 PM 12/13/2023

```

Q2:

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

```
void sumarray(int arr[3][3], int brr[3][3], int crr[3][3]) {
```

```
    for(int i=0; i<3;i++){
        for(int j=0; j<3; j++){
            crr[i][j] = arr[i][j] + brr[i][j];
        }
    }
}
```

```
int main(){
    int arr[3][3],brr[3][3],crr[3][3];
```

```
    cout<<"Enter the elements of array 1 "<<endl;
```

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

```
    cout<<"Enter the elements of array 2 "<<endl;
```

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



```

for(int i=0; i<3;i++){
for(int j=0; j<3; j++){
cout<<arr[i][j]<<" + "<<brr[i][j]<<" ";
}
cout<<endl;
}
sumarray(arr, brr, crr);
cout<<"Sum of 2D Arrays is "<<endl;
for(int i=0; i<3;i++){
for(int j=0; j<3; j++){
cout<<crr[i][j]<<" ";
}
cout<<endl;
}
return 0;
}

```

The screenshot shows a Dev-C++ window with a C++ program being executed. The program calculates the sum of two 3x3 matrices, arr and brr, and stores the result in crr. The output is displayed in the console window, showing the elements of the resulting matrix crr and the sum of the two matrices.

```

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```



```
cout<<arr[j][i]<<" ";
}
cout<<endl;
}
}

int main(){

int arr[3][3];
cout<<"Enter the elements of matrix "<<endl;
for(int i=0; i<3;i++){
for(int j=0; j<3; j++){

cin>>arr[i][j];
}
}

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

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

transpose(arr);
return 0;
}
```



```

D:\ME-15\top lab\Lab manual 9\Lab Task\Q3.cpp - [Executing] - Dev-C++ 5.11
Enter the elements of matrix
1
2
3
4
5
6
7
7
7
1 2 3
4 5 6
7 7 7
Transpose of matrix is
1 4 7
2 5 7
3 6 7
-----
Process exited after 8.526 seconds with return value 0
Press any key to continue . . .
32
33
34 transpose(arr);
35 return 0;
36
Compiler Resources Compile Log Debug Find Results Close
Compilation results...
- Errors: 0
- Warnings: 0
- Output Filename: D:\ME-15\top lab\Lab manual 9\Lab Task\Q3.exe
- Output Size: 1.35766897664795 MiB
- Compilation Time: 0.66s
Line: 32 Col: 6 Sel: 0 Lines: 36 Length: 574 Insert Done parsing in 0.015 seconds
Type here to search USD/JPY -0.87% 3:36 PM 12/14/2023

```

Q4:

```

#include<iostream>
using namespace std;
void matrixmulti(int matrix1[3][3], int matrix2[3][3],int mult[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 += matrix1[i][k]*matrix2[k][j];
mult[i][j]=sum;
}
}
}
cout<<"multiplication of matrices is "<<endl;

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

}
int main(){

```



```
int matrix1[3][3], matrix2[3][3], mult[3][3];
cout<<"Enter the elements of matrix 1 "<<endl;
for(int i=0; i<3;i++){
for(int k=0; k<3; k++){
cin>>matrix1[i][k];
}
}
cout<<"Enter the elements of matrix 2 "<<endl;
for(int k=0; k<3;k++){
for(int j=0; j<3; j++){
cin>>matrix2[k][j];
}
}
cout<<"matrix 1"<<endl;
for(int i=0; i<3;i++){
for(int k=0; k<3; k++){
cout<<matrix1[i][k]<<" ";
}
}
cout<<endl;
}
cout<<"matrix 2"<<endl;
for(int k=0; k<3;k++){
for(int j=0; j<3; j++){
cout<<matrix2[k][j]<<" ";
}
}
cout<<endl;
}
matrixmulti(matrix1,matrix2,mult);

return 0;
}
```



```
D:\ME-15\top lab\Lab manual 9\Lab Task\Q4.exe
Enter the elements of matrix 1
1
2
3
4
5
6
7
8
9
Enter the elements of matrix 2
1
0
0
0
1
0
0
0
1
0
0
1
matrix 1
1 2 3
4 5 6
7 8 9
matrix 2
1 0 0
0 1 0
0 0 1
multiplication of matrices is
1 2 3
4 5 6
7 8 9
.....
Process exited after 27.95 seconds with return value 0
Press any key to continue . . .
```

Q5:

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

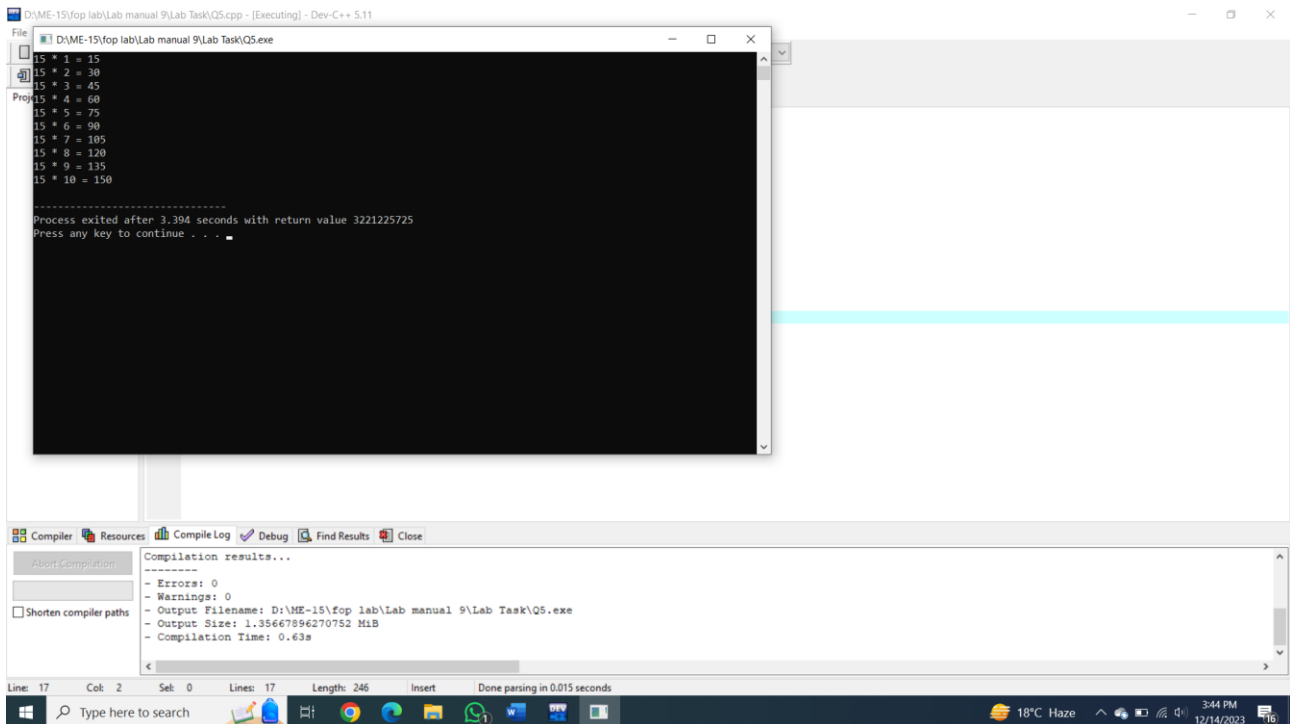
```
void table(int N, int i)
{
    if (i <= 10)
```

```
        cout <<N<<" * "<<i<<" = "<< N * i<<endl;
        return table(N, i + 1);
    }
```

```
int main()
```

```
{
    int N = 15;
    table(N, 1);
```

```
    return 0;
}
```

Home Task

Q1:

```
#include<iostream>
```

```
using namespace std;
```

```
double Determinant(int mat[3][3]) {
```

```
return mat[0][0] * (mat[1][1] * mat[2][2] - mat[1][2] * mat[2][1]) - mat[0][1] * (mat[1][0] *
mat[2][2] - mat[1][2] * mat[2][0]) + mat[0][2] * (mat[1][0] * mat[2][1] - mat[1][1] * mat[2][0]);
}
```

```
void Adjoint(int mat[3][3], int adj[3][3]) {
```

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

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

```
adj[i][j] = (mat[(j+1)%3][(i + 1)%3] * mat[(j+2)%3][(i+2)%3]) -
(mat[(j+1)%3][(i+2)%3] * mat[(j+2)%3][(i+1)%3]);
```

```
}
```

```
}
```

```
}
```

```
void Inverse(int mat[3][3], double inv[3][3]) {
```

```
double det = Determinant(mat);
```

```
if (det==0) {
```

```
cout<<"Inverse does not exist (Matrix is singular)!"<<endl;
```

```
return;
```



```
}
int adj[3][3];
Adjoint(mat,adj);
for (int i=0; i<3; i++) {
for (int j=0; j<3; j++) {
inv[i][j]=adj[i][j]/det;
}
}
}
int main() {
int mat[3][3];
cout << "Enter elements of the matrix:"<<endl;
for (int i=0; i<3; i++) {
for (int j=0; j<3; j++) {
cin>>mat[i][j];
}
}
double inv[3][3];
Inverse(mat, inv);
if (Determinant(mat) != 0) {
cout << "Inverse of the matrix:"<<endl;
for (int i=0; i<3; i++) {
for (int j=0; j<3; j++) {
cout<<inv[i][j] << " ";
}
}
cout<<endl;
}
}
return 0;
}
```



D:\ME-15\top lab\Lab manual 9\New folder\Q1.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

(globals)

Project Classes Debug

[*] Untitled1 Q1.cpp

```

19 | return;
20 | }

```

D:\ME-15\top lab\Lab manual 9\New folder\Q1.exe

Enter elements of the matrix:

```

1
3
7
0
8
6
4
3
2

```

Inverse of the matrix:

```

0.012887 -0.0975826 0.246753
-0.155844 0.168831 0.038961
0.207792 -0.0584416 -0.0519481

```

Process exited after 7.134 seconds with return value 0
Press any key to continue . . .

Compiler Resources

Alert Compilation

Shorten compiler paths

- Errors: 0
- Warnings: 0
- Output Filename: D:\ME-15\top lab\Lab manual 9\New folder\Q1.exe
- Output Size: 1.35872554779053 MiB
- Compilation Time: 0.61s

Line: 45 Col: 13 Sel: 0 Lines: 49 Length: 1247 Insert Done parsing in 0 seconds

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