Fundamentals of Programming

Lab Manual: 09

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Course: ME-15

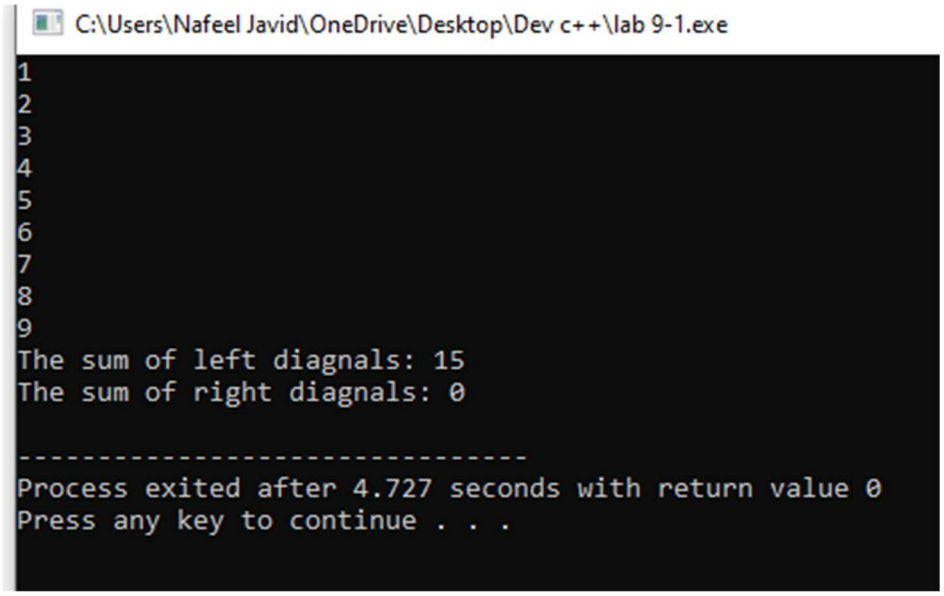
Section: A

Task: 01

- #include<iostream>

```
using namespace std;

int main() {

	int matrix[3][3];

	int x(0),y(0);

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

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

			cin>>matrix[i][j];

		}

	}
```

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

                if(i==i){

                        x+=matrix[i][i];

                }

                else if ((i+i)==2){

                        y+=matrix[i][i+1];

                }

        }

        cout<<"The sum of left diagnals: "<<x<<endl;

        cout<<"The sum of right diagnals: "<<y<<endl;

        return 0;

}
```



Task: 02

- #include<iostream>

using namespace std;

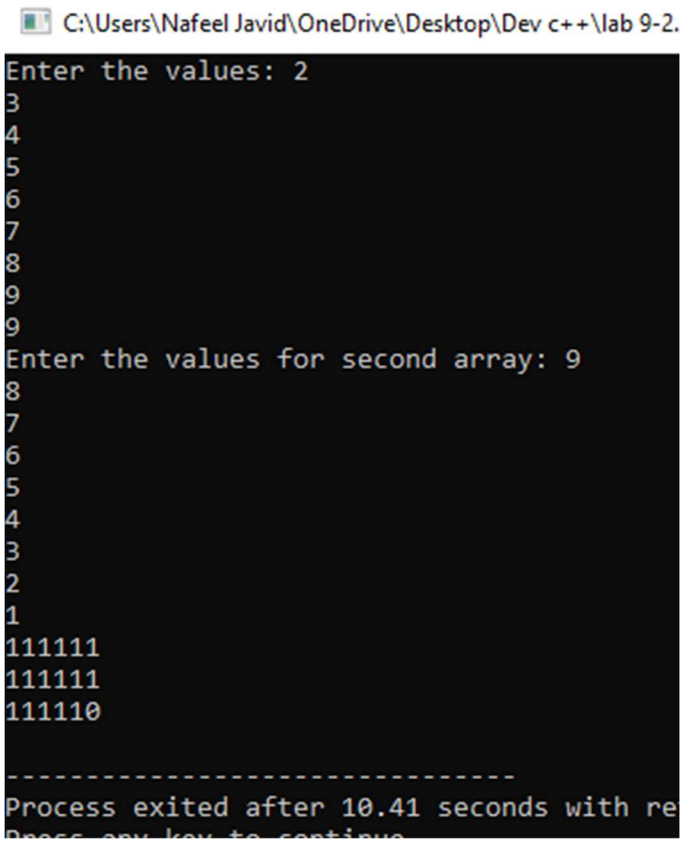
void add(int ar[3][3],int ar2[3][3])

{

```
        int x[3][3];

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

{



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

        {

                x[i][j]=ar[i][j]+ar2[i][j];

                cout<<x[i][j];

        }

        cout<<endl;

        }



}
```

```
int main()

{

	int a[3][3],b[3][3],sum[3][3];

	cout<<"Enter the values: ";

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

	{

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

		{

			cin>>a[i][j];

		}

	}

		cout<<"Enter the values for second array: ";

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

```
        {

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

                {

                        cin>>b[i][j];

                }

        }

        add(a,b)

}
```



Task: 03

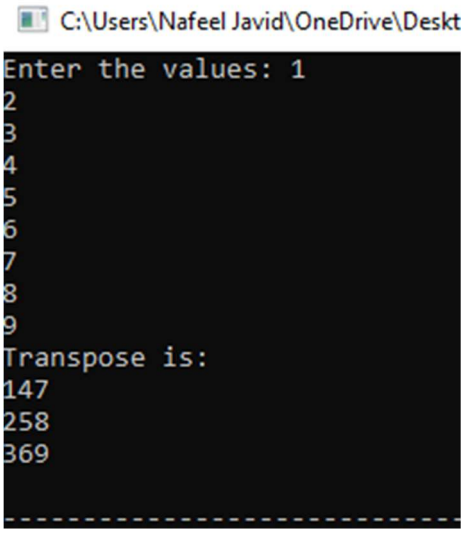
- #include<iostream>

using namespace std;

```
int transpose(int ar[3][3])

{

        int x;

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

        {

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

         {if(i<j)

         {

                x=ar[i][j];

                ar[i][j]=ar[j][i];

                ar[j][i]=x;

         }

         }
```

```
        }

}

int main()

{

        int y[3][3],x;

        cout<<"Enter the values: ";

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

        {

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

                {

                        cin>>y[i][j];

                }

        }
```

```
    transpose(y);

        cout<<"Transpose is:  "<<endl;

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

        {

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

                {

                 cout<<y[i][j];

                }

                cout<<endl;

        }

}
```



Task: 04

- #include<iostream>

using namespace std;

int x(int y[3][3],int z[3][3])

{

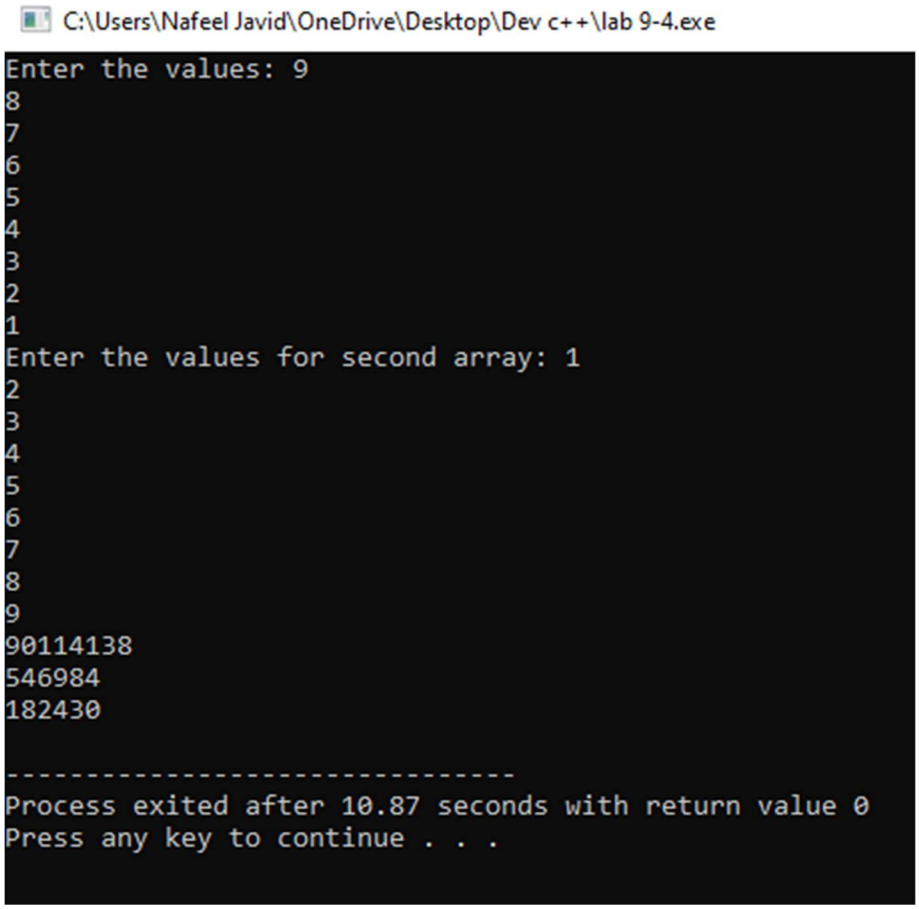
int p,s[3][3]={{0,0,0},{0,0,0},{0,0,0}};

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

{

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

        {

   p =y[i][j]*z[j][0];

        s[i][0]=s[i][0]+p;

        }

}       for(int i=0;i<3;i++)

{

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

        {

        p=y[i][j]*z[j][1];

        s[i][1]=s[i][1]+p;
```

```
            }
}           for(int i=0;i<3;i++)
{
            for(int j=0;j<3;j++)
            {
            p=y[i][j]*z[j][2];
            s[i][2]=s[i][2]+p;
            }
}
for(int i=0;i<3;i++)
{
            for(int j=0;j<3;j++)
            {
```

```
                cout<<s[i][j];

            }

            cout<<endl;

        }

}

int main()

{

        int a[3][3],b[3][3];

        cout<<"Enter the values: ";

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

        {

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

            {
```

```
                cin>>a[i][j];

            }

        }

            cout<<"Enter the values for second array: ";

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

        {

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

            {

                cin>>b[i][j];

            }

        }

    x(a,b);

}
```



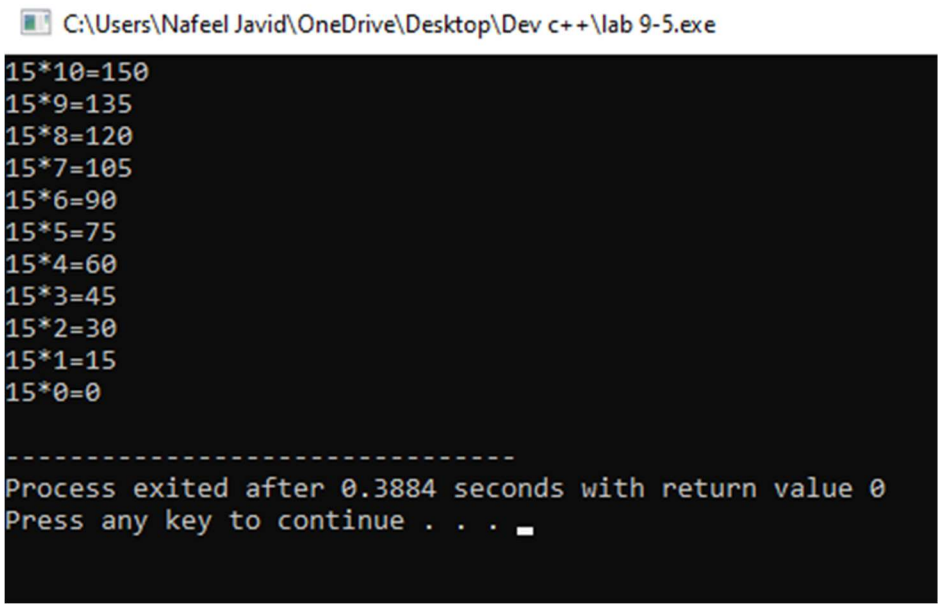
Task: 05

- #include<iostream>

using namespace std;

```
void x(int a,int n)

{

if(n>=0)

{

        int y;

        y=n*a;

        cout<<a<<"*"<<n<<"="<<y<<endl;

        x(a,n-1);

}

}



int main()

{
```

```
int z(15),a(10);


x(15,10);


return 0;


}
```



Task:06

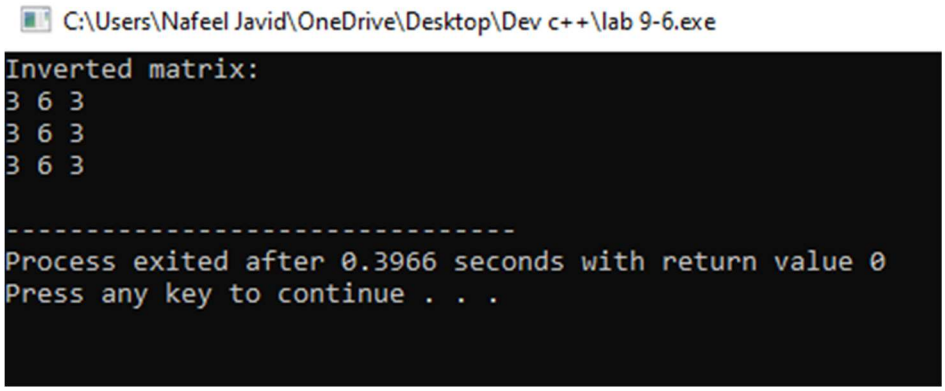
- **#include <iostream>**

```
#include <math.h>

using namespace std;



int determinant(int matrix[3][3]) {

   int determinant = matrix[0][0] * (matrix[1][1] * matrix[2][2] - matrix[1][2] * matrix[2][1]) +

             matrix[0][1] * (matrix[1][0] * matrix[2][2] - matrix[1][2] * matrix[2][0]) +

             matrix[0][2] * (matrix[1][0] * matrix[2][1] - matrix[1][1] * matrix[2][0]);

   return determinant;

}



void adjoint(int matrix[3][3], int adj[3][3]) {

   adj[0][0] = (matrix[1][1] * matrix[2][2] - matrix[1][2] * matrix[2][1]) * (-1);

   adj[0][1] = (matrix[1][0] * matrix[2][2] - matrix[1][2] * matrix[2][0]) * (-1);
```

```
    adj[0][2] = (matrix[1][0] * matrix[2][1] - matrix[1][1] * matrix[2][0]) * (-1);

    adj[1][0] = (matrix[1][1] * matrix[2][2] - matrix[1][2] * matrix[2][1]) * (-1);

    adj[1][1] = (matrix[1][0] * matrix[2][2] - matrix[1][2] * matrix[2][0]) * (-1);

    adj[1][2] = (matrix[1][0] * matrix[2][1] - matrix[1][1] * matrix[2][0]) * (-1);

    adj[2][0] = (matrix[1][1] * matrix[2][2] - matrix[1][2] * matrix[2][1]) * (-1);

    adj[2][1] = (matrix[1][0] * matrix[2][2] - matrix[1][2] * matrix[2][0]) * (-1);

    adj[2][2] = (matrix[1][0] * matrix[2][1] - matrix[1][1] * matrix[2][0]) * (-1);

}



void invert(int matrix[3][3], int adj[3][3]) {

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

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

            matrix[i][j] = adj[i][j];
```

```
        }

    }

}



int main() {

    int matrix[3][3] = {

        {1, 2, 3},

        {4, 5, 6},

        {7, 8, 9}

    };



    int adj[3][3];

    adjoint(matrix, adj);
```

```
    invert(matrix, adj);




    cout << "Inverted matrix: " << endl;

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

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

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

        }

        cout << endl;

    }




    return 0;

}
```


C:\Users\Nafeel Javid\OneDrive\Desktop\Dev c++\lab 9-6.exe
Inverted matrix:
3 6 3
3 6 3
3 6 3

Process exited after 0.3966 seconds with return value 0
Press any key to continue . . .