

ASSIGNMENT NO 6

//write a program for 2D transformation -SCALING,TRANSLATION,ROTATION

```
#include<iostream>
#include<graphics.h>
#include<math.h>
using namespace std;
int m;
class Polygon
{
    public:
    double b[10][3];
    Polygon()
    {
        for(int i=0;i<10;i++)
        for(int j=0;j<3;j++)
        b[i][j]=0;
    }
    Polygon(int x)
    {
        for(int i=0;i<10;i++)
        for(int j=0;j<3;j++)
        b[i][j]=0;
        switch(x)
        {
            case 1:
                int sx,sy;
                cout<<"Enter the scaling factor for x:";
                cin>>sx;
                cout<<"Enter the scaling factor for y:";
                cin>>sy;

                b[0][0]=sx;b[1][1]=sy;b[2][2]=1;
                break;

            case 2:
                int tx,ty;
                cout<<"Enter the value with which you want to translate polygon along x axis:";
                cin>>tx;
                cout<<"Enter the value with which you want to translate polygon along y axis:";
                cin>>ty;
                b[0][0]=1;
                b[1][1]=1;
                b[2][2]=1;
                b[2][0]=tx;
                b[2][1]=ty;
                break;

            case 3:
                double theta;
                cout<<"\nEnter the angle:";
                cin>>theta;
                theta=theta*(3.14/180);
                b[0][0]=cos(theta);b[0][1]=sin(theta);
```

```

        b[1][0]=-sin(theta);b[1][1]=cos(theta);
        b[2][2]=1;
break;
}
}
    public:
    void accept()
    {
        cout<<"Enter the number of sides:";
        cin>>m;
        cout<<"Enter the co-ordinates:";
        for(int i=0;i<m;i++)
        {
            for(int j=0;j<2;j++)
                cin>>b[i][j];
            b[i][2]=1;
        }
    }

    void display()
    {
        int i;

        line(0,240,640,240);
        line(320,0,320,480);
        for(i=0;i<m-1;i++)
        {
            line(b[i][0]+320,240-b[i][1],b[i+1][0]+320,240-b[i+1][1]);
        }
        line(b[i][0]+320,240-b[i][1],b[0][0]+320,240-b[0][1]);
    }
Polygon operator *(Polygon t)
{
    Polygon temp;
    for(int i=0;i<m;i++)
        for(int j=0;j<3;j++)
        {
            temp.b[i][j]=0;
            for(int k=0;k<m;k++)
                temp.b[i][j]=temp.b[i][j]+b[i][k]*t.b[k][j];
            cout<<temp.b[i][j];
        }

    return temp;
}
};

int main()
{
    Polygon p;

```

```

        Polygon n;
        int choice;

        p.accept();
        int gd=DETECT, gm;

do
{
        cout<<"\nWhat would you like to do?";
        cout<<"\n1)Scale.\n2)Translate.\n3)Rotate.\n";
        cin>>choice;
        Polygon z(choice);

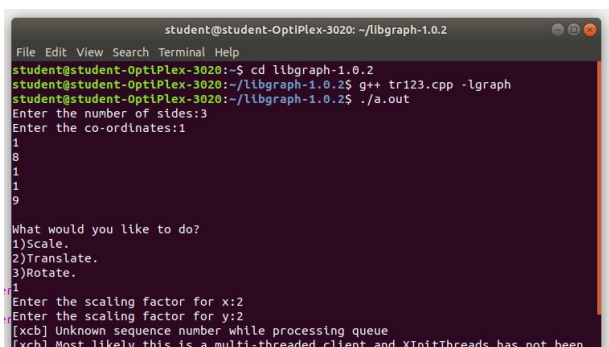
        n=p*z;
        initgraph(&gd,&gm,NULL);
                p.display();
                        n.display();

        getch();
        closegraph();

}while(1);

        return 0;
}
//OUTPUT for scaling

```



```

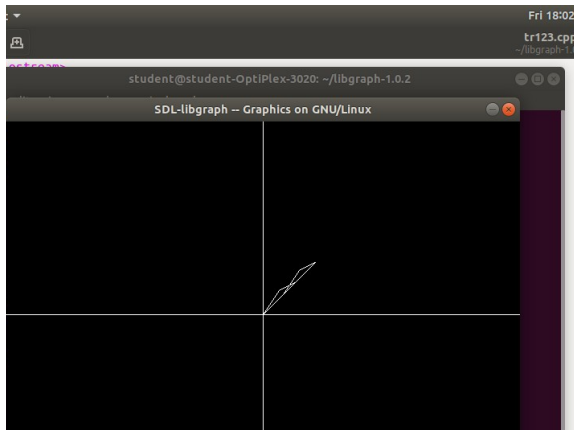
student@student-OptiPlex-3020: ~/libgraph-1.0.2
File Edit View Search Terminal Help
student@student-OptiPlex-3020:~$ cd libgraph-1.0.2
student@student-OptiPlex-3020:~/libgraph-1.0.2$ g++ tr123.cpp -lgraph
student@student-OptiPlex-3020:~/libgraph-1.0.2$ ./a.out
Enter the number of sides:3
Enter the co-ordinates:1
1
8
1
1
9
What would you like to do?
1)Scale.
2)Translate.
3)Rotate.
1
Enter the scaling factor for x:2
Enter the scaling factor for y:2
[xcb] Unknown sequence number while processing queue
[xcb] Most likely this is a multi-threaded client and XInitThreads has not been

```



//OUTPUT for translation

```
icli File Edit View Search Terminal Help
icli student@student-OptiPlex-3020:~$ cd libgraph-1.0.2
icli student@student-OptiPlex-3020:~/libgraph-1.0.2$ g++ tr123.cpp -lgraph
icli student@student-OptiPlex-3020:~/libgraph-1.0.2$ ./a.out
Enter the number of sides:3
Enter the co-ordinates:0
0
20
30
40
40
What would you like to do?
1)Scale.
2)Translate.
3)Rotate.
2
Enter the value with which you want to translate polygon along x axis:25
Enter the value with which you want to translate polygon along y axis:25
[xcb] Unknown sequence number while processing queue
[xcb] Most likely this is a multi-threaded client and XInitThreads has not been
```



//OUTPUT for rotation

```
icli student@student-OptiPlex-3020:~/libgraph-1.0.2
icli student@student-OptiPlex-3020:~/libgraph-1.0.2$ g++ tr123.cpp -lgraph
icli student@student-OptiPlex-3020:~/libgraph-1.0.2$ ./a.out
Enter the number of sides:4
Enter the co-ordinates:0
0
10
10
10
10
What would you like to do?
1)Scale.
2)Translate.
3)Rotate.
3
Enter the angle:45
[xcb] Unknown sequence number while processing queue
[xcb] Most likely this is a multi-threaded client and XInitThreads has not been
```

