

# Assignment No. 4

**Title:** Write C++ program to draw 2-D object and perform following basic transformation **Source**

**Code:**

```
#include<iostream>

#include<graphics.h>

#include<math.h> using

namespace std; class

transform

{

    public: int

    m,a[20][20],c[20][20];

    int i,j,k;

    public:

    void object(); void accept();

    void operator *(float b[20][20])

    {

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

        {

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

            { c[i][j]=0; for(int

            k=0;k<m;k++)

            {

                c[i][j]=c[i][j]+(a[i][k]*b[k][j]);
```

```

}

}

}

}

};

void transform::object()

{

    int gd, gm; gd=DETECT;

    initgraph(&gd, &gm, NULL);

    line(300, 0, 300, 600);

    line(0, 300, 600, 300); for(

    i=0; i<m-1; i++)

    {

        line(300+a[i][0], 300-a[i][1], 300+a[i+1][0], 300-a[i+1][1]);

    }

    line(300+a[0][0], 300-a[0][1], 300+a[i][0], 300-a[i][1]);

    for( i=0; i<m-1; i++)

    {

        line(300+c[i][0], 300-c[i][1], 300+c[i+1][0], 300-c[i+1][1]);

    }

    line(300+c[0][0], 300-c[0][1], 300+c[i][0], 300-c[i][1]);

    int temp; cout << "Press 1 to continue"; cin >>

    temp; closegraph();

}

void transform::accept()

```

```

{
cout<<"\n"; cout<<"Enter the
Number Of Edges:"; cin>>m;
cout<<"\nEnter The Coordinates :";
for(int i=0;i<m;i++)
{
for(int j=0;j<3;j++)
{
if(j>=2)
a[i][j]=1; else
cin>>a[i][j];
}
}
}

int main()
{
int ch,tx,ty,sx,sy; float
deg,theta,b[20][20];
transform t;
t.accept();

cout<<"\nEnter your choice"; cout<<"\n1.Translation"
"\n2.Scaling"
"\n3.Rotation";
cin>>ch; switch(ch)
{

```

```
case 1: cout<<"\nTRANSLATION OPERATION\n";  
cout<<"Enter value for tx and ty:"; cin>>tx>>ty;  
b[0][0]=b[2][2]=b[1][1]=1;  
b[0][1]=b[0][2]=b[1][0]=b[1][2]=0; b[2][0]=tx;  
b[2][1]=ty; t * b;
```

```
t.object(); break; case 2:  
cout<<"\nSCALING OPERATION\n";  
cout<<"Enter value for sx,sy:"; cin>>sx>>sy;
```

```
b[0][0]=sx; b[1][1]=sy;  
b[0][1]=b[0][2]=b[1][0]=b[1][2]=0;  
b[2][0]=b[2][1]=0; b[2][2] = 1; t *  
b;
```

```
t.object(); break; case 3:  
cout<<"\nROTATION OPERATION\n";  
cout<<"Enter value for angle:"; cin>>deg;  
theta=deg*(3.14/100);  
b[0][0]=b[1][1]=cos(theta);  
b[0][1]=sin(theta); b[1][0]=sin(-theta);  
b[0][2]=b[1][2]=b[2][0]=b[2][1]=0; b[2][2]=1;  
t * b;
```

```
t.object();  
break; default:  
cout<<"\nInvalid choice";
```

```
}
```

```
getch();
```

```
return 0;
```

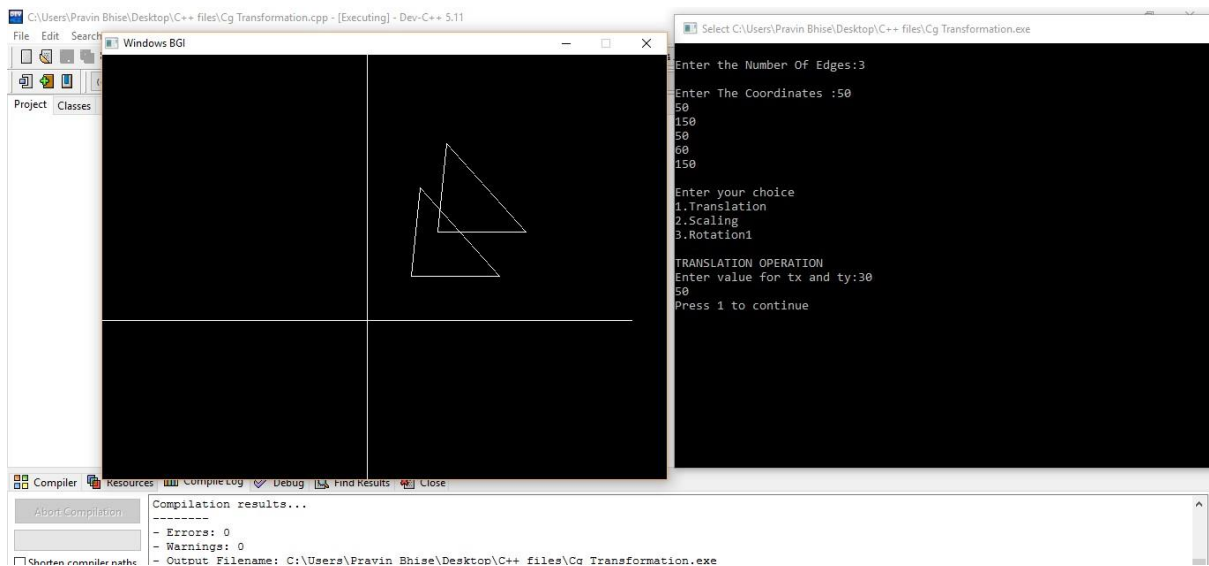
```
}
```

## Input:-

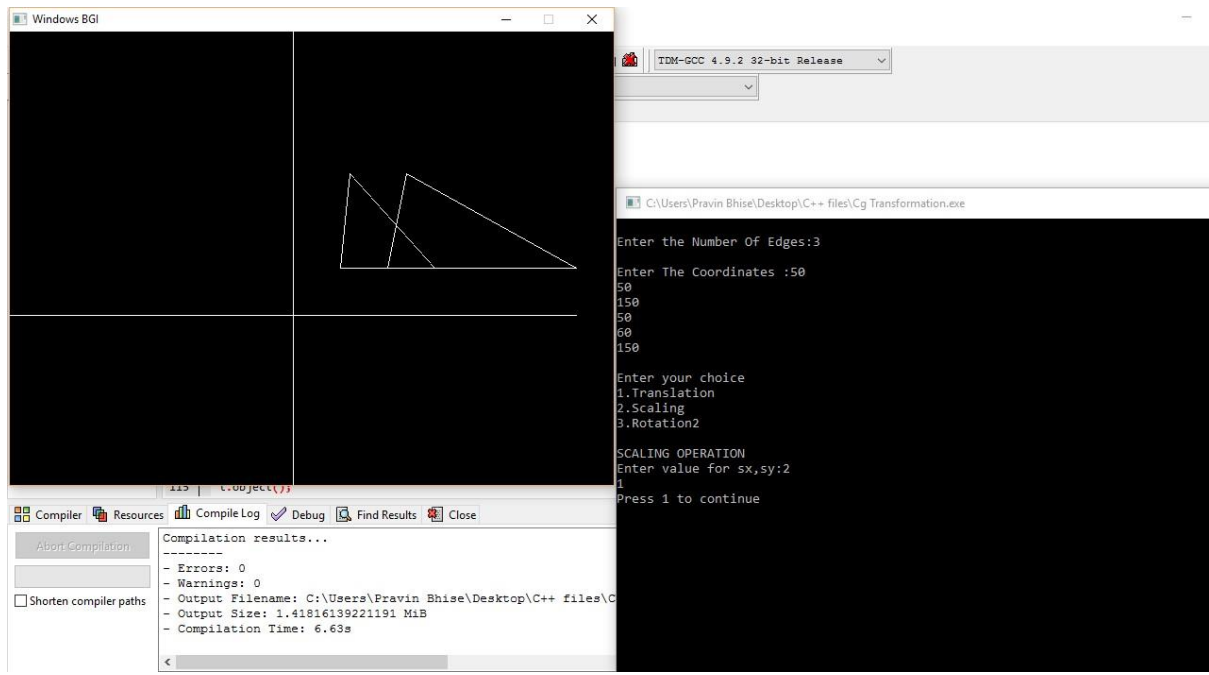
Provided in image given below.

## Output:

### For Translation:



### For Scaling:



## For Rotation:

