EXPERIMENT – 3

Drawing a ellipse using Ellipse Generating Algorithm

CODE :

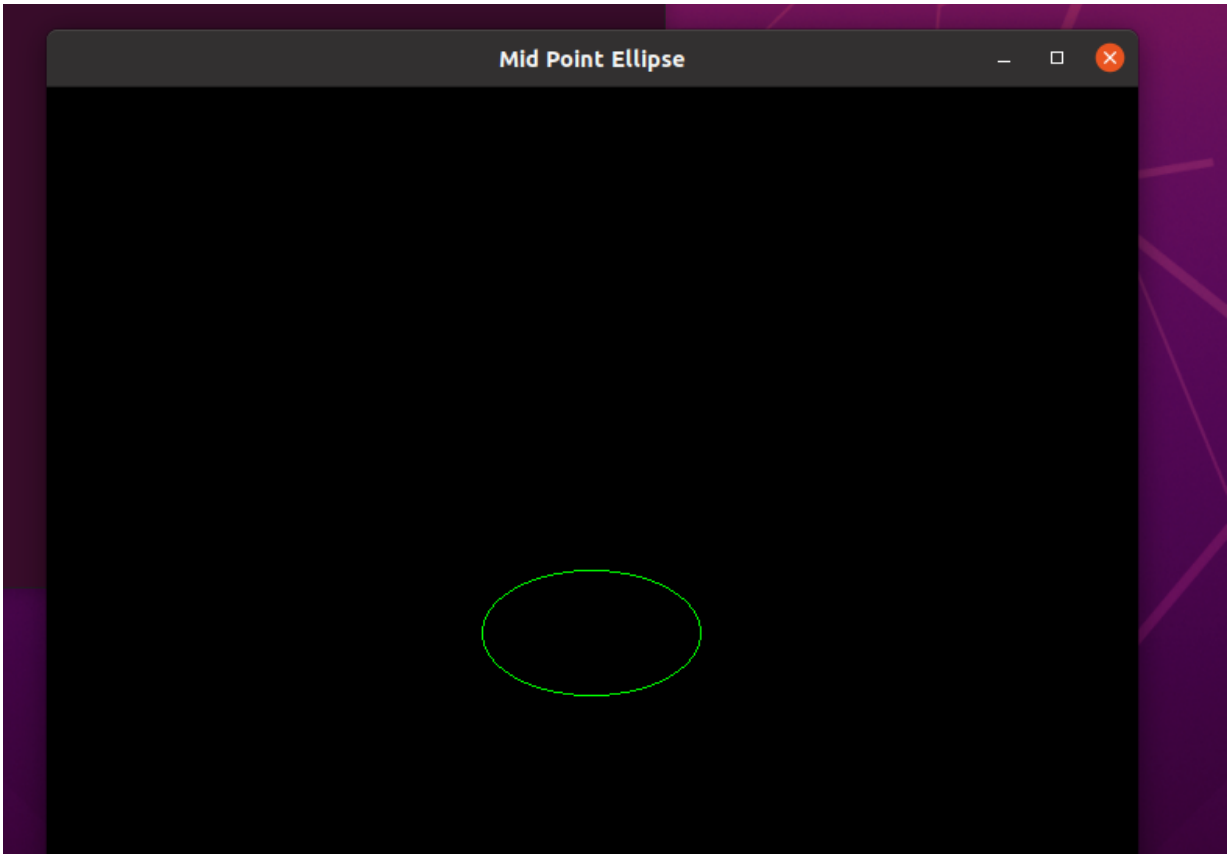
```
#include<GL/glut.h>
#include<GL/gl.h>
#include<iostream>
using namespace std;
int rx,ry;
void init()
{
glClearColor(0.0,0.0,0.0,1.0); //Blue background
glMatrixMode(GL_PROJECTION);
gluOrtho2D(0,700,0,700);
}
void display()
{
/////////////////
        glClear(GL_COLOR_BUFFER_BIT);
        int c1,c2,x,y,p1,p2,x1,y1,x2,y2;
        c1 = 0;
        x = 0;
x1=x+350;
        y = ry;
y1=y+350;

        p1 = (ry*ry) - (rx*rx)*ry + ((rx*rx)/4);
x2=700-x1;
y2=700-y1;
glColor3f(0,1,0);
glBegin(GL_POINTS);
glVertex2d(x1,y1);
glVertex2d(x1,y2);
glVertex2d(x2,y1);
glVertex2d(x2,y2);
glEnd();
glFlush();
        while((ry*ry*x)<=(rx*rx*y))
        {
                x = x + 1;
```

```
x1++;
                if(p1<0)
                {
                        //y remains same
                        p1 = p1 + (ry*ry) + 2*(ry*ry)*x;
                }
                else
                {
                        y = y-1;
                        p1 = p1 + (ry*ry*(2*x+1)) - 2*(rx*rx)*(y);
y1--;
                }
        x2=700-x1;
y2=700-y1;
glColor3f(0,1,0);
glBegin(GL_POINTS);
glVertex2d(x1,y1);
glVertex2d(x1,y2);
glVertex2d(x2,y1);
glVertex2d(x2,y2);
glEnd();
glFlush();
        }
        // Starting Region 2
        c2 = 0;
        p2 =  (ry*ry)*(x+0.5)*(x+0.5) + (rx*rx)*(y-1)*(y-1) - (rx*rx*ry*ry);
        x2=700-x1;
y2=700-y1;
glColor3f(0,1,0);
glBegin(GL_POINTS);
glVertex2d(x1,y1);
glVertex2d(x1,y2);
glVertex2d(x2,y1);
glVertex2d(x2,y2);
glEnd();
glFlush();
        while((y>0)&&(x<=rx))
        {
                y = y-1;
y1--;
                if(p2<0)
                {
                        x = x + 1;
x1++;
```

```
                p2 = p2 + (rx*rx)*(1-2*y) + 2*(ry*ry)*x;
            }
            else
            {
                p2 = p2 + (rx*rx)*(1-2*y);
            }
        x2=700-x1;
y2=700-y1;
glColor3f(0,1,0);
glBegin(GL_POINTS);
glVertex2d(x1,y1);
glVertex2d(x1,y2);
glVertex2d(x2,y1);
glVertex2d(x2,y2);
glEnd();
glFlush();
        }
////////////////
}
int main(int argc,char **argv)
{
        cout<<"Mid point Ellipse Algorithm"<<endl;
        cout<<"Enter rx: ";
        cin>>rx;
        cout<<"Enter ry: ";
        cin>>ry;
glutInit(&argc,argv);
glutInitDisplayMode(GLUT_SINGLE|GLUT_RGB);
glutInitWindowSize(700,700);
glutCreateWindow("Mid Point Ellipse");
init();
glutDisplayFunc(display);
glutMainLoop();
}
```

OUTPUT :


Mid Point Ellipse