

EXP3

AIM: Draw an ellipse using ellipse generation 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++;
```

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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:

```
blaze@ubuntu:~/Desktop/cg$ gedit exp3.2.cpp
blaze@ubuntu:~/Desktop/cg$ g++ exp3.2.cpp -lglut -lGLU -lGL
blaze@ubuntu:~/Desktop/cg$ ./a.out
Mid point Ellipse Algorithm
Enter rx: 70
Enter ry: 30
█
```

