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#include<windows.h>
#include <GL/glut.h>
#include<math.h>
int width = 800, height = 800;
int cx=400,cy=400;
float r=150,r2=300;
void drawLine(int x1, int y1, int x2, int y2)
{
    glLineWidth(5);
    glBegin(GL_LINES);
    glVertex2i(x1, y1);
    glVertex2i(x2, y2);
    glEnd();
    glFlush();
}
void plot(int x, int y)
{
    glBegin(GL_POINTS);
    glVertex2i(x+cx, y+cy);
    glEnd();
}
void midPointCircleAlgo()
{
    int x = 0;
    int y = r;
    float decision = 5/4 - r;
    plot(x, y);

    while (y > x)
    {
        if (decision < 0)
        {
            x++;
            decision += 2*x+1;
        }
        else
        {
            y--;
            x++;
            decision += 2*(x-y)+1;
        }
        plot(x, y);
        plot(x, -y);
        plot(-x, y);
        plot(-x, -y);
        plot(y, x);
        plot(-y, x);
        plot(y, -x);
        plot(-y, -x);
    }
}

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}
void midPointCircleAlgo2()
{
    int x = 0;
    int y = r2;
    float decision = 5/4 - r2;
    plot(x, y);

    while (y > x)
    {
        if (decision < 0)
        {
            x++;
            decision += 2*x+1;
        }
        else
        {
            y--;
            x++;
            decision += 2*(x-y)+1;
        }
        plot(x, y);
        plot(x, -y);
        plot(-x, y);
        plot(-x, -y);
        plot(y, x);
        plot(-y, x);
        plot(y, -x);
        plot(-y, -x);
    }
}

void display()
{
    glClearColor(0.0, 0.0, 0.0, 0.0);
    glColor3f(1.0, 1.0, 1.0);
    glClear(GL_COLOR_BUFFER_BIT);
    //triangle
    drawLine(141,250,659,250);
    drawLine(400,700,141,250);
    drawLine(659,250,400,700);

    //circle2
    glColor3f (1.0, 1.0, 1.0);
    glPointSize(2.0);
    midPointCircleAlgo();
    //circle1
    glColor3f (1.0, 1.0, 1.0);
    glPointSize(2.0);
    midPointCircleAlgo2();
}

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    glFlush();
}

void myinit()
{
    glViewport(0,0,width,height);
    glMatrixMode(GL_PROJECTION);
    glLoadIdentity();
    gluOrtho2D(0.0,(GLdouble)width,0.0,(GLdouble)height);
    glMatrixMode(GL_MODELVIEW);
}
int main(int argc, char** argv)
{
    glutInit(&argc,argv);
    glutInitDisplayMode (GLUT_SINGLE | GLUT_RGB);
    glutInitWindowSize(width,height);
    glutCreateWindow("7241_Priya");
    glutDisplayFunc(display);
    myinit();
    glutMainLoop();
    return 0;
}
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