#include<stdio.h>

#include<GL/glut.h>

#define outcode int

double xmin=50,ymin=50,xmax=100,ymax=100;

double xvmin=200,yvmin=200,xvmax=300,yvmax=300;

double x0,y0,x1,y1;

const int RIGHT=8;

const int LEFT=2;

const int TOP=4;

const int BOTTOM=1;

outcode ComputeOutCode(double x, double y);

**void CohenSutherland(double x0, double y0, double x1, double y1)**

**{**

outcode outcode0, outcode1, outcodeOut;

bool accept=false, done=false;

outcode0=ComputeOutCode(x0,y0);

outcode1=ComputeOutCode(x1,y1);

do

{

if(!(outcode0|outcode1))

{

accept=true;

done=true;

}

else if(outcode0&outcode1)

done=true;

else

{

double x, y;

outcodeOut=outcode0?outcode0:outcode1;

if(outcodeOut&TOP)

{

x=x0+(x1-x0)\*(ymax-y0)/(y1-y0);

y=ymax;

}

else if(outcodeOut&BOTTOM)

{

x=x0+(x1-x0)\*(ymin-y0)/(y1-y0);

y=ymin;

}

else if(outcodeOut&RIGHT)

{

y=y0+(y1-y0)\*(xmax-x0)/(x1-x0);

x=xmax;

}

else

{

y=y0+(y1-y0)\*(xmin-x0)/(x1-x0);

x=xmin;

}

if(outcodeOut==outcode0)

{

x0=x;

y0=y;

outcode0=ComputeOutCode(x0,y0);

}

else

{

x1=x;

y1=y;

outcode1=ComputeOutCode(x1,y1);

}

}

}while(!done);

if(accept)

{

double sx=(xvmax-xvmin)/(xmax-xmin);

double sy=(yvmax-yvmin)/(ymax-ymin);

double vx0=xvmin+(x0-xmin)\*sx;

double vy0=yvmin+(y0-ymin)\*sy;

double vx1=xvmin+(x1-xmin)\*sx;

double vy1=yvmin+(y1-ymin)\*sy;

glColor3f(1.0,0.0,0.0);

glBegin(GL\_LINE\_LOOP);

glVertex2f(xvmin, yvmin);

glVertex2f(xvmax, yvmin);

glVertex2f(xvmax, yvmax);

glVertex2f(xvmin, yvmax);

glEnd();

glColor3f(0.0,0.0,1.0);

glBegin(GL\_LINES);

glVertex2d(vx0,vy0);

glVertex2d(vx1,vy1);

glEnd();

}

**}**

**outcode ComputeOutCode(double x, double y)**

**{**

outcode code=0;

if(y>ymax)

code=TOP;

else if(y<ymin)

code=BOTTOM;

if(x>xmax)

code=RIGHT;

else if(x<xmin)

code=LEFT;

return code;

**}**

**void display()**

**{**

glClear(GL\_COLOR\_BUFFER\_BIT);

glColor3f(1.0,0.0,0.0);

glBegin(GL\_LINES);

glVertex2d(x0,y0);

glVertex2d(x1,y1);

glEnd();

glColor3f(0.0,0.0,1.0);

glBegin(GL\_LINE\_LOOP);

glVertex2f(xmin, ymin);

glVertex2f(xmax, ymin);

glVertex2f(xmax, ymax);

glVertex2f(xmin, ymax);

glEnd();

CohenSutherland(x0,y0,x1,y1);

glFlush();

**}**

**void myinit()**

**{**

glClearColor(1.0,1.0,1.0,1.0);

glMatrixMode(GL\_PROJECTION);

glLoadIdentity();

gluOrtho2D(0.0,499.0,0.0,499.0);

**}**

**void main(int argc, char\*\* argv)**

**{**

printf("Enter the end points of the line: ");

scanf("%lf%lf%lf%lf", &x0,&y0,&x1,&y1);

glutInit(&argc, argv);

glutInitDisplayMode(GLUT\_SINGLE|GLUT\_RGB);

glutInitWindowSize(500,500);

glutInitWindowPosition(0,0);

glutCreateWindow("Cohen-Sutherland Line Clipping");

glutDisplayFunc(display);

myinit();

glutMainLoop();

**}**