**EXPERIMENT - 05**

**5. Program to clip a lines using Cohen-Sutherland line-clipping algorithm.**

#include<stdio.h>

#include<GL\glut.h>

doublexmin=50,ymin=50,xmax=100,ymax=100;

doublexvmin=200,yvmin=200,xvmax=300,yvmax=300;

constintRIGHT=8;

constintLEFT=2;

constintTOP=4;

constintBOTTOM=1;

intComputeOutCode(doublex,doubley)

{

intcode=0;

if(y>ymax)//above the clip window

code|=TOP;

elseif(y<ymin)//below the clip window

code|=BOTTOM;

if(x>xmax)//to the right of clip window

code|=RIGHT;

elseif(x<xmin)//to the left of clip window

code|=LEFT;

returncode;

}

voidCohenSutherland(doublex0,doubley0,doublex1,doubley1)

{

intoutcode0,outcode1,outcodeOut;

boolaccept=false,done=false;

outcode0=ComputeOutCode(x0,y0);

outcode1=ComputeOutCode(x1,y1);

do{

if(!(outcode0|outcode1))

{

accept=true;

done=true;

}

elseif(outcode0&outcode1)

done=true;

else{

doublex,y;

outcodeOut=outcode0?outcode0:outcode1;

if(outcodeOut&TOP)

{

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

y=ymax;

}

elseif(outcodeOut&BOTTOM)

{

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

y=ymin;

}

elseif(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)

{

doublesx=(xvmax-xvmin)/(xmax-xmin);

doublesy=(yvmax-yvmin)/(ymax-ymin);

doublevx0=xvmin+(x0-xmin)\*sx;

doublevy0=yvmin+(y0-ymin)\*sy;

doublevx1=xvmin+(x1-xmin)\*sx;

doublevy1=yvmin+(y1-ymin)\*sy;

glColor3f(1.0,1.0,1.0);

glBegin(GL\_LINE\_LOOP);

glVertex2f(xvmin,yvmin);

glVertex2f(xvmax,yvmin);

glVertex2f(xvmax,yvmax);

glVertex2f(xvmin,yvmax);

glEnd();

glColor3f(1.0,1.0,1.0);

glBegin(GL\_LINES);

glVertex2d(vx0,vy0);

glVertex2d(vx1,vy1);

glEnd();

}

}

voiddisplay()

{

doublex0=60,y0=20,x1=80,y1=120;

glClear(GL\_COLOR\_BUFFER\_BIT);

glColor3f(1.0,1.0,1.0);

glBegin(GL\_LINES);

glVertex2d(x0,y0);

glVertex2d(x1,y1);

glEnd();

glColor3f(1.0,1.0,1.0);

glBegin(GL\_LINE\_LOOP);

glVertex2f(xmin,ymin);

glVertex2f(xmax,ymin);

glVertex2f(xmax,ymax);

glVertex2f(xmin,ymax);

}

glEnd();

CohenSutherland(x0,y0,x1,y1);

glFlush();

voidmyinit()

{

glClearColor(0.0,0.0,0.0,1.0);

glMatrixMode(GL\_PROJECTION);

glLoadIdentity();

gluOrtho2D(0.0,500.0,0.0,500.0);

glMatrixMode(GL\_MODELVIEW);

}

voidmain(intargc,char \***\***argv)

{

glutInit(&argc,argv);

glutInitDisplayMode(GLUT\_SINGLE|GLUT\_RGB);

glutInitWindowSize(500,500);

glutInitWindowPosition(0,0);

glutCreateWindow("Cohen Suderland Line Clipping Algorithm");

myinit();

glutDisplayFunc(display);

glutMainLoop();

}