**EXPERIMENT - 09**

**9. Develop a menu driven program to fill any given polygon using scan-line area filling**

**algorithm.**

#include<stdlib.h>

#include<stdio.h>

#include<glut.h>

floatx1,x2,x3,x4,y1,y2,y3,y4;

intfillFlag=0;

voidedgedetect(floatx1,floaty1,floatx2,floaty2,int\*le,int\*re)

{

floatmx,x,temp;

inti;

if((y2-y1)<0){

temp=y1;y1=y2;y2=temp;

temp=x1;x1=x2;x2=temp;

}

if((y2-y1)!=0)

mx=(x2-x1)/(y2-y1);

else

mx=x2-x1;

x=x1;

for(i=y1;i<=y2;i++)

{

if(x<(float)le[i])

le[i]=(int)x;

if(x>(float)re[i])

re[i]=(int)x;

x+=mx;

}

}

voiddraw\_pixel(intx,inty)

{

glColor3f(1.0,1.0,0.0);

glBegin(GL\_POINTS);

glVertex2i(x,y);

glEnd();

}

voidscanfill(floatx1,floaty1,floatx2,floaty2,floatx3,floaty3,floatx4,floaty4)

{

intle[500],re[500];

inti,y;

for(i=0;i<500;i++)

{

le[i]=500;

re[i]=0;

}

edgedetect(x1,y1,x2,y2,le,re);

edgedetect(x2,y2,x3,y3,le,re);

edgedetect(x3,y3,x4,y4,le,re);

edgedetect(x4,y4,x1,y1,le,re);

for(y=0;y<500;y++)

{

for(i=(int)le[y];i<(int)re[y];i++)

draw\_pixel(i,y);

}

}

voiddisplay()

{

x1=200.0;y1=200.0;x2=100.0;y2=300.0;x3=200.0;y3=400.0;x4=300.0;y4=300.0;

glClear(GL\_COLOR\_BUFFER\_BIT);

glColor3f(0.0,0.0,1.0);

glBegin(GL\_LINE\_LOOP);

glVertex2f(x1,y1);

glVertex2f(x2,y2);

glVertex2f(x3,y3);

glVertex2f(x4,y4);

glEnd();

if(fillFlag==1)

scanfill(x1,y1,x2,y2,x3,y3,x4,y4);

glFlush();

}

voidinit()

{

glClearColor(0.0,0.0,0.0,1.0);

glColor3f(1.0,0.0,0.0);

glPointSize(1.0);

glMatrixMode(GL\_PROJECTION);

glLoadIdentity();

gluOrtho2D(0.0,499.0,0.0,499.0);

}

voidfillMenu(intoption)

{

if(option==1)

fillFlag=1;

if(option==2)

fillFlag=2;

display();

}

voidmain(intargc,char\*argv[])

{

glutInit(&argc,argv);

glutInitDisplayMode(GLUT\_SINGLE|GLUT\_RGB);

glutInitWindowSize(500,500);

glutInitWindowPosition(0,0);

glutCreateWindow("Filling a Polygon using Scan-line Algorithm");

init();

glutDisplayFunc(display);

glutCreateMenu(fillMenu);

glutAddMenuEntry("Fill Polygon",1);

glutAddMenuEntry("Empty Polygon",2);

glutAttachMenu(GLUT\_RIGHT\_BUTTON);

glutMainLoop();

}