**9: Scan-line**

#define BLACK 0 #include <stdlib.h>

#include <stdio.h> #include <GL/glut.h>

int submenu; float x1,x2,x3,x4,y1,y2,y3,y4;

void edgedetect(float x1,float y1,float x2,float y2,int\*le

,int \*re)

{ float mx,x,temp; int i;

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; } }

void draw\_pixel(int x,int y,int value)

{ glBegin(GL\_POINTS); glVertex2i(x,y); glEnd(); }

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

{ int le[500],re[500]; int i,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++)

{ if(le[y]<=re[y])

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

draw\_pixel(i,y,BLACK); } }

void display()

{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);

glBegin(GL\_LINE\_LOOP);

glVertex2f(x1,y1); glVertex2f(x2,y2);

glVertex2f(x3,y3); glVertex2f(x4,y4);

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

glFlush(); }

void myinit()

{ glClearColor(1.0,1.0,1.0,1.0);

glPointSize(1.0); glMatrixMode(GL\_PROJECTION);

glLoadIdentity(); gluOrtho2D(0.0,499.0,0.0,499.0); }

void menufunc(int n)

{ switch(n)

{ case 1:

glColor3f(1.0, 0.0, 0.0); break;

case 2:

glColor3f(0.0, 1.0, 0.0); break;

case 3: glColor3f(0.0, 0.0, 1.0); } }

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

{glutInit(&argc,argv);glutInitDisplayMode(GLUT\_SINGLE|GLUT\_RGB); glutInitWindowSize(500,500);

glutInitWindowPosition(0,0); glutCreateWindow("Filling a Polygon using Scan-line Algorithm");

submenu=glutCreateMenu(menufunc);

glutCreateMenu(menufunc);glutAddMenuEntry("RED",1);glutAddMenuEntry("GREEN",2);glutAddMenuEntry("BLUE",3); glutAttachMenu(GLUT\_RIGHT\_BUTTON);

glutDisplayFunc(display); myinit();

glutMainLoop(); return 0; }