

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

```
#include <stdlib.h>
#include <stdio.h>
#include <GL/glut.h>
float a1,a2,a3,a4,b1,b2,b3,b4;
int fillFlag=0;
void edgedetect(float a1,float b1,float a2,float b2,int *le,int *re)
{
    float mx,x,temp;
    int i;
    if((b2-b1)<0)
    {
        temp=b1;b1=b2;b2=temp;
        temp=a1;a1=a2;a2=temp;
    }
    if((b2-b1)!=0)
    mx=(a2-a1)/(b2-b1);
else
    mx=a2-a1;
    x=a1;
    for(i=b1;i<=b2;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)
{
    glColor3f(1.0,1.0,0.0);
    glBegin(GL_POINTS);
    glVertex2i(x,y);
    glEnd();
}
void scanfill(float a1,float b1,float a2,float b2,float a3,float
b3,float a4,float b4)
{
    int le[500],re[500];
    int i,y;
    for(i=0;i<500;i++)
    {
        le[i]=500;
        re[i]=0;
    }
    edgedetect(a1,b1,a2,b2,le,re);
    edgedetect(a2,b2,a3,b3,le,re);
    edgedetect(a3,b3,a4,b4,le,re);
    edgedetect(a4,b4,a1,b1,le,re);
}
```

```
        for(y=0;y<500;y++)
        {
            for(i=(int)le[y];i<(int)re[y];i++)
            draw_pixel(i,y);
        }
    }
void display()
{
    a1=200.0;b1=200.0;a2=100.0;b2=300.0;a3=200.0;b3=400.0;a4=300.0;b4=300.0;
    glClear(GL_COLOR_BUFFER_BIT);
    glColor3f(0.0, 0.0, 1.0);
    glBegin(GL_LINE_LOOP);
    glVertex2f(a1,b1);
    glVertex2f(a2,b2);
    glVertex2f(a3,b3);
    glVertex2f(a4,b4);
    glEnd();
    if(fillFlag==1)
        scanfill(a1,b1,a2,b2,a3,b3,a4,b4);
    glFlush();
}
void myInit()
{
    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);
}
void fillMenu(int option)
{
    if(option==1)
        fillFlag=1;
    if(option==2)
        fillFlag=2;
    display();
}
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");
    myInit();
    glutDisplayFunc(display);
    glutCreateMenu(fillMenu);
    glutAddMenuEntry("Fill Polygon",1);
    glutAddMenuEntry("Empty Polygon",2);
    glutAttachMenu(GLUT_RIGHT_BUTTON);
}
```

```
    glutMainLoop();  
}
```

OUTPUT :