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

```c
#include <stdlib.h>
#include  <stdio.h>
#include <glut.h>
float x1,x2,x3,x4,y1,y2,y3,y4;
int fillFlag=0;
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)
{
 glColor3f(1.0,1.0,0.0);
 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++)
```

```c
 {
  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);
 }
}
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);
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();
}

void init()
{
 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();
}
void 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");
 init();
 glutDisplayFunc(display);
 glutCreateMenu(fillMenu);
 glutAddMenuEntry("Fill Polygon",1);
 glutAddMenuEntry("Empty Polygon",2);
 glutAttachMenu(GLUT_RIGHT_BUTTON);
 glutMainLoop();
}
```

OUTPUT :