MALNAD COLLEGE OF ENGINEERING

(An Autonomous Institute under VTU, Belagavi)

HASSAN – 573202

Subject: Computer Graphics and Visualization **Code:**

18CS602

Submitted by:

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4MC18CS057

6th Sem, B sec

Computer Science

Program to fill any given polygon using scan-line area filling algorithm. (Use appropriate data structures)

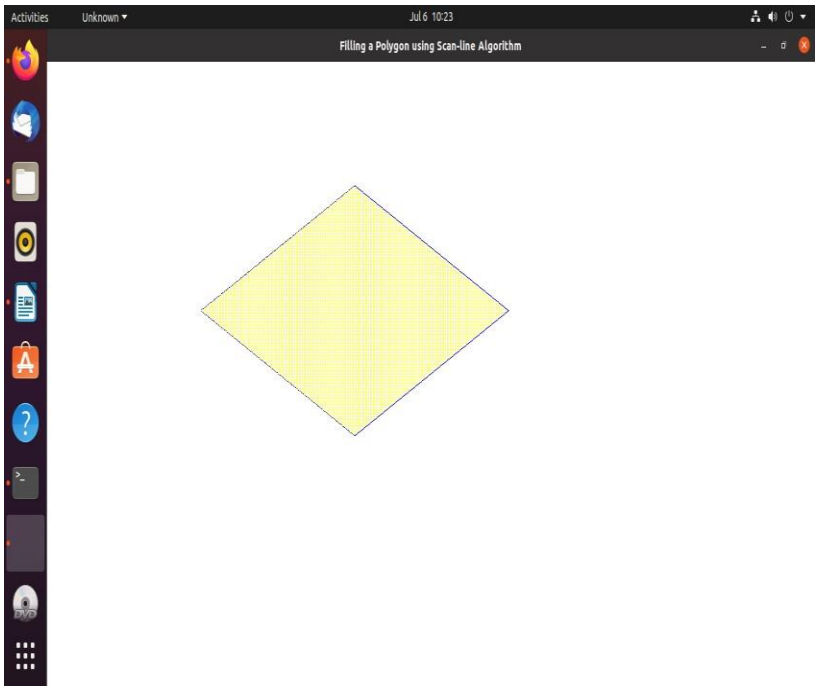
Objective:
In this program the students will learn to apply scan-line area filling algorithm to fill a polygon using OpenGL functions.

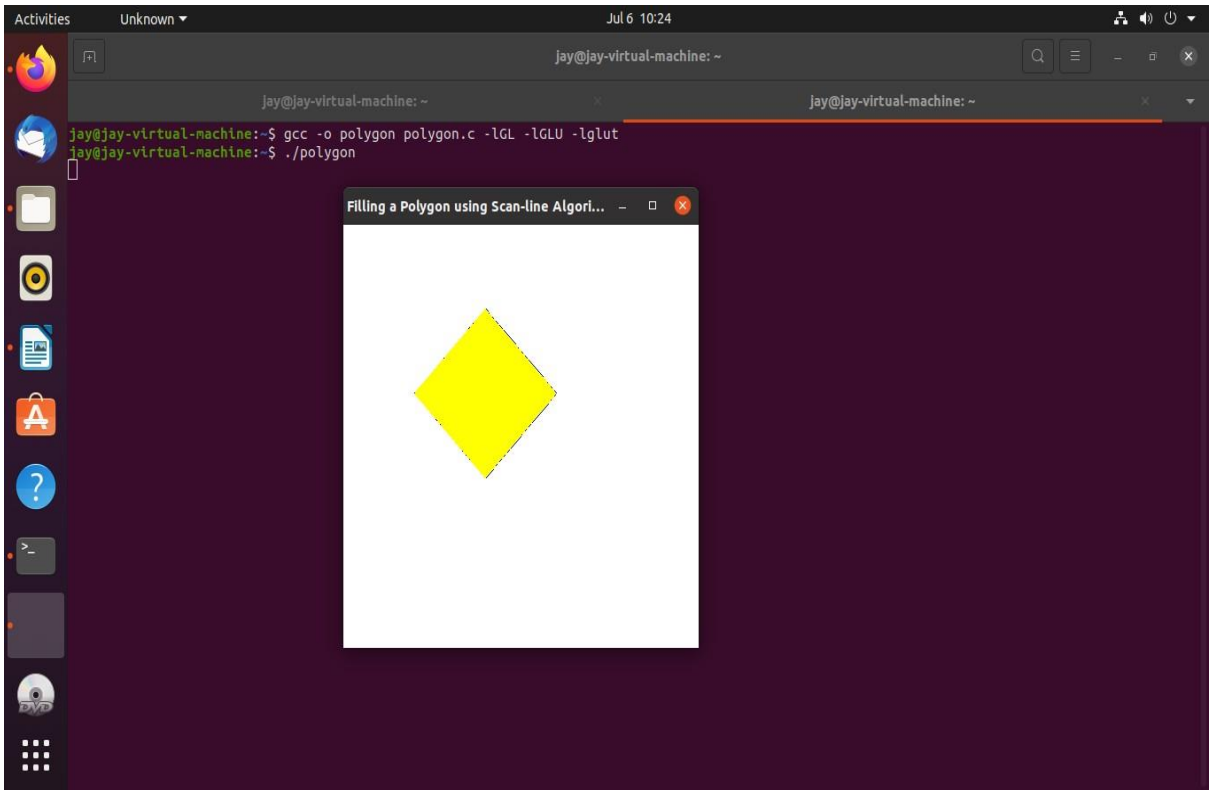
```
// Scan-Line algorithm for filling a polygon
#include <stdlib.h>
#include <stdio.h> #include
<GL/glut.h> float
x1,x2,x3,x4,y1,y2,y3,y4;
void edgedetect(float x1,float y1,float x2,float y2,int *le,int *re)
{
float mx,x,temp;
int i;
        if((y2-y1)<0)
        {
                temp=y1;y1=y2;y2=temp;
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)
{
        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++)
        {
                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);

        }

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

glFlush();
}

void myinit()
{
        glClearColor(1.0,1.0,1.0,1.0);
glColor3f(1.0,0.0,0.0);          glPointSize(1.0);
glMatrixMode(GL_PROJECTION);
glLoadIdentity();
        gluOrtho2D(0.0,499.0,0.0,499.0);
}

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");
        glutDisplayFunc(display);
myinit();
```

```
    glutMainLoop();
}
```

Output:




Activities
Unknown
Jul 6 10:24
jay@jay-virtual-machine: ~
jay@jay-virtual-machine: ~
jay@jay-virtual-machine: ~
jay@jay-virtual-machine:~$ gcc -o polygon polygon.c -lGL -lGLU -lglut
jay@jay-virtual-machine:~$ ./polygon
Filling a Polygon using Scan-line Algori...