5.

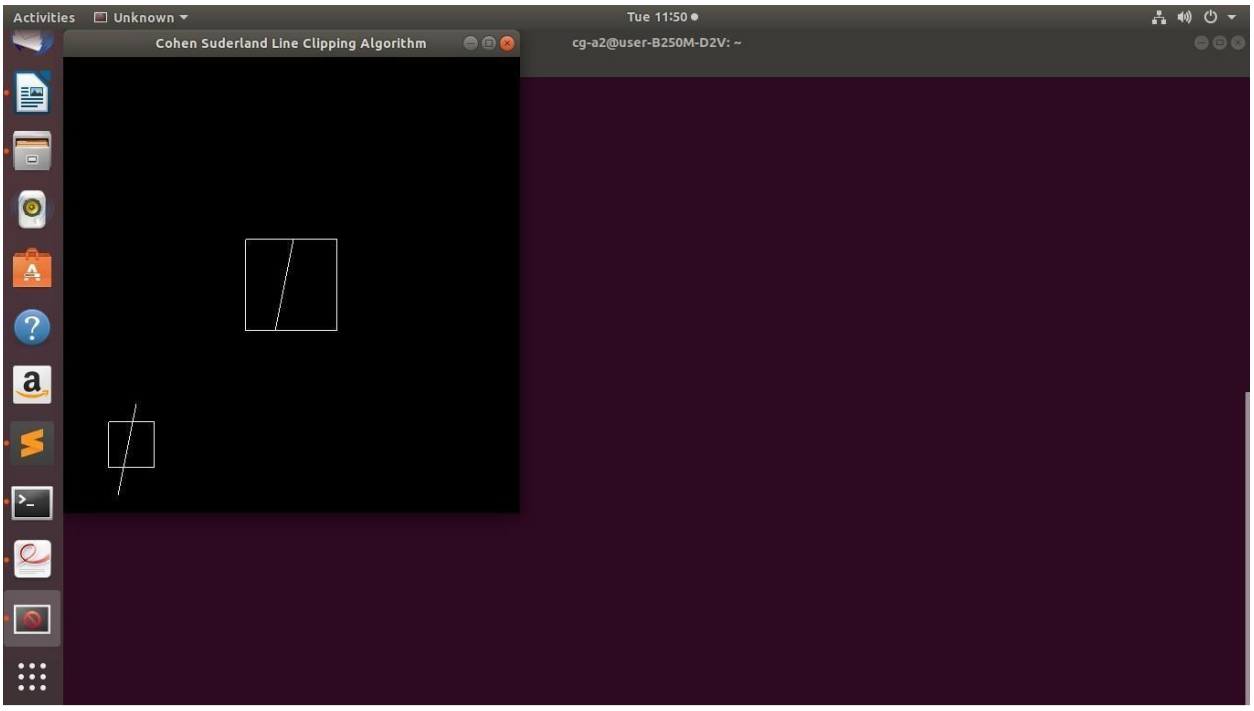
Program to clip a lines using Cohen-Sutherland line-clipping algorithm.

```
#include <stdio.h>
#include<stdbool.h>
#include <GL/glut.h>
      double xmin=50,ymin=50, xmax=100,ymax=100;
      double xvmin=200,yvmin=200,xvmax=300,yvmax=300;
      const int RIGHT = 8;
      const int LEFT = 2;
      const int TOP = 4;
      const int BOTTOM = 1;
      int ComputeOutCode (double x, double y)
{
      int code = 0;
      if (y > ymax)
//above the clip window
      code |= TOP;
else if (y < ymin)
//below the clip window
      code |= BOTTOM;
      if (x > xmax)
//to the right of clip window
      code |= RIGHT;
else if (x < xmin)
//to the left of clip window
      code |= LEFT;
      return code;
}
void CohenSutherland(double x0, double y0,double x1, double y1)
{
      int outcode0, outcode1, outcodeOut;
      bool accept = false, done = false;
      outcode0 = ComputeOutCode (x0, y0);
      outcode1 = ComputeOutCode (x1, y1);
      do
      {
            if (!(outcode0 | outcode1))
            {
                  accept = true;
                  done = true;
            }
      else if (outcode0 & outcode1)
      done = true;
else
            {
                  double x, y;
                  outcodeOut = outcode0? outcode0: outcode1;
                  if (outcodeOut & TOP)
                  {
                  x = x0 + (x1 - x0) * (ymax - y0)/(y1 - y0);
                  y = ymax;
```

```
                }
else if (outcodeOut & BOTTOM)
            {
            x = x0 + (x1 - x0) * (ymin - y0)/(y1 - y0);
            y = ymin;
            }
else if (outcodeOut & RIGHT)
            {
            y = y0 + (y1 - y0) * (xmax - x0)/(x1 - x0);
            x = xmax;
            }
else
            {
            y = y0 + (y1 - y0) * (xmin - x0)/(x1 - x0);
            x = xmin;
            }
      if (outcodeOut == outcode0)
            {
            x0 = x;
            y0 = y;
            outcode0 = ComputeOutCode (x0, y0);
            }
else
      {
      x1 = x;
      y1 = y;
      outcode1 = ComputeOutCode (x1, y1);
      }
      }
}while (!done);
if (accept)
{
      double sx=(xvmax-xvmin)/(xmax-xmin);
      double sy=(yvmax-yvmin)/(ymax-ymin);
      double vx0=xvmin+(x0-xmin)*sx;
      double vy0=yvmin+(y0-ymin)*sy;
      double vx1=xvmin+(x1-xmin)*sx;
      double vy1=yvmin+(y1-ymin)*sy;
      glColor3f(1.0, 1.0, 1.0);
      glBegin(GL_LINE_LOOP);
      glVertex2f(xvmin, yvmin);
      glVertex2f(xvmax, yvmin);
      glVertex2f(xvmax, yvmax);
      glVertex2f(xvmin, yvmax);
      glEnd();
      glColor3f(1.0,1.0,1.0);
      glBegin(GL_LINES);
      glVertex2d (vx0, vy0);
      glVertex2d (vx1, vy1);
      glEnd();
}
}
```

```
void display()
{
      double x0=60,y0=20,x1=80,y1=120;
      glClear(GL_COLOR_BUFFER_BIT);
      glColor3f(1.0,1.0,1.0);
      glBegin(GL_LINES);
      glVertex2d (x0, y0);
      glVertex2d (x1, y1);
      glEnd();
      glColor3f(1.0, 1.0, 1.0);
      glBegin(GL_LINE_LOOP);
      glVertex2f(xmin, ymin);
      glVertex2f(xmax, ymin);
      glVertex2f(xmax, ymax);
      glVertex2f(xmin, ymax);
      glEnd();
      CohenSutherland(x0,y0,x1,y1);
      glFlush();
}
void myinit()
{
      glClearColor(0.0,0.0,0.0,1.0);
      glMatrixMode(GL_PROJECTION);
      glLoadIdentity();
      gluOrtho2D(0.0,500.0,0.0,500.0);
      glMatrixMode(GL_MODELVIEW);
}
int main(int argc, char **argv)
{
      glutInit(&argc,argv);
      glutInitDisplayMode(GLUT_SINGLE|GLUT_RGB);
      glutInitWindowSize(500,500);
      glutInitWindowPosition(0,0);
      glutCreateWindow("Cohen Suderland Line Clipping Algorithm");
      myinit();
      glutDisplayFunc(display);
      glutMainLoop();
}
```

OUTPUT:


Activities
Unknown
Tue 11:50
Cohen Suderland Line Clipping Algorithm
cg-a2@user-B250M-D2V: ~