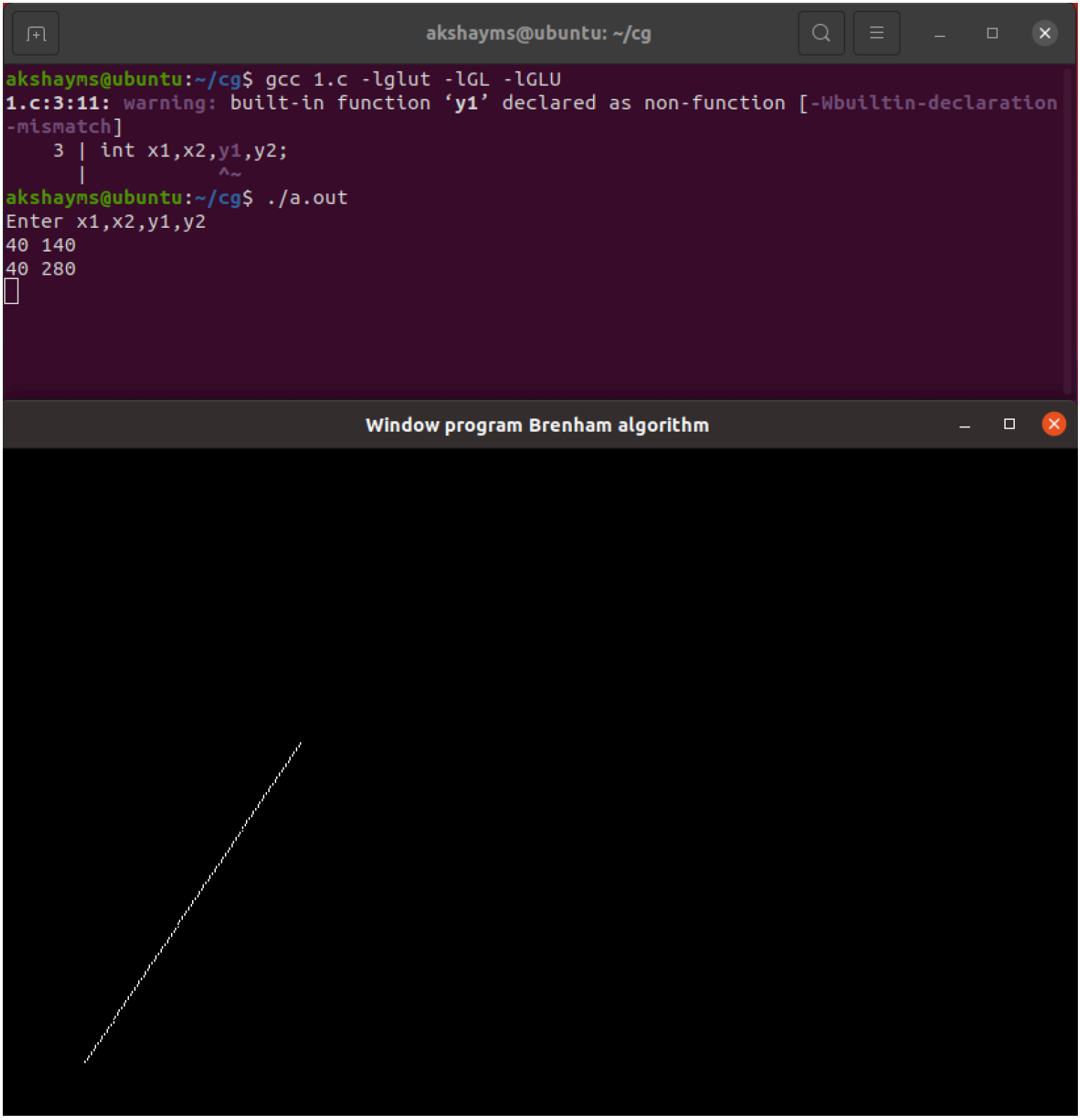
1. Implement Brenham's line drawing algorithm for all types of slope.

```
#include<stdio.h>
#include<GL/glut.h>
int x1,x2,y1,y2;
void myInit(){
  glClearColor(0.0,0.0,0.0,1.0);
  glClear(GL_COLOR_BUFFER_BIT);
  //glColor3f(0.9,0.3,0.3);
  glMatrixMode(GL_PROJECTION);
  gluOrtho2D(0,500,0,500);
}
void draw_pixel(int x,int y){
  glBegin(GL_POINTS);
  glVertex2i(x,y);
  glEnd();
}
void draw_line(int x1,int x2,int y1,int y2){
  int e,i,x,y,dx,dy,incx,incy,inc1,inc2;
  dx = x2 - x1;
  dy = y2 - y1;
  if(dx<0)
        dx = -dx;
  if(dy<0)
        dy = -dy;
  incx=1;
  if(x2<x1)
        incx=-1;
  incy=1;
  if(y2<y1)
        incy=-1;
  x=x1;
  y=y1;
  if(dx>dy){
        draw_pixel(x,y);
        e = 2*dy-dx;
        inc1 = 2*(dy-dx);
        inc2 = 2*dy;
        for(i=0;i<dx;i++){
              if(e>=0){
                    y+=incy;
                    e+=inc1;
```

```
                }
                else
                        e+=inc2;
                x+=incx;
                draw_pixel(x,y);
        }
  }
  else{
        draw_pixel(x,y);
        e = 2*dx-dy;
        inc1 = 2*(dx-dy);
        inc2 = 2*dx;
        for(i=0;i<dy;i++){
                if(e>=0){
                        x+=incx;
                        e+=inc1;
                }
                else
                        e+=inc2;
                y+=incy;
                draw_pixel(x,y);
        }
  }
}
void myDisplay(){
  glClear(GL_COLOR_BUFFER_BIT);
  draw_line(x1,x2,y1,y2);
  glFlush();
}
int main(int argc,char **argv){
  printf("Enter x1,x2,y1,y2\n");
  scanf("%d%d%d%d",&x1,&x2,&y1,&y2);
  glutInit(&argc,argv);
  glutInitDisplayMode(GLUT_SINGLE|GLUT_RGB);
  glutInitWindowSize(500,500);
  glutInitWindowPosition(0,0);
  glutCreateWindow("Window program Brenham algorithm");
  glutDisplayFunc(myDisplay);
  myInit();
  //glEnable(GL_DEPTH_TEST);
  //glClearColor(0.0,0.0,0.0,0.0);
  glutMainLoop();
}
```

Output


akshayms@ubuntu: ~/cg
akshayms@ubuntu:~/cg$ gcc 1.c -lglut -lGL -lGLU
1.c:3:11: warning: built-in function ‘y1’ declared as non-function [-Wbuiltin-declaration-mismatch]
3 | int x1,x2,y1,y2;
| ^~
akshayms@ubuntu:~/cg$ ./a.out
Enter x1,x2,y1,y2
40 140
40 280
Window program Brenham algorithm