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Program - 1

Write a program to generate a line using Bresenham's line drawing technique. Consider slopes greater than one and slope less than one. User must be able to draw as many lines and specify inputs through keyboard/mouse.

```
#include<iostream>
#include<GL/glut.h>
#include<time.h>

using namespace std;
int x1, x2, y1, y2;
int flag = 0;

void draw_pixel(int x, int y)
{
    glColor3f(1,0,0);
    glBegin(GL_POINTS);
    glVertex2i(x,y);
    glEnd();
    glFlush();
}

void draw_line()
{
    int dx, dy, i, e;
    int incx, incy, inc1, inc2;
    int x, y;
```

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```
dx = x2 - x1;
dy = y2 - y1;
if (dx < 0) dx = -dx;
if (dy < 0) dy = -dy;
incx = 1;
if (x2 < x1)
        incx = -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);
       }
 }
```

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```
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 += inc1;
            e += inc1;
        }
        else
        {
            e += inc2;
            y += inc4y;
            draw_pixel(x,y);
        }
    }
    glFlush();
}

void myinit()
{
    glclear(GL_COLOR_BUFFER_BIT);
    glclearcolor(1,1,1,1);
    gluOrtho2D(-250,250,-250,250);
}
```

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```
void MyMouse(int button, int state, int x, int y)
{
    switch (button)
    {
        case GLUT_LEFT_BUTTON:
            if (state == GLUT_DOWN)
            {
                if (flag == 0)
                {
                    printf("\n Defining x1, y1");
                    x1 = x - 250;
                    yc1 = 250 - y;
                    flag++;
                    cout<<x1<<" "<<yc1<<"\n";
                }
                else
                {
                    printf("\nDefining x2, y2");
                    x2 = x - 250;
                    y2 = 250 - y;
                    flag = 0;
                    cout<<x2<<" "<<y2<<"\n";
                    draw_line();
                }
            }
            break;
    }
}
```

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```
void display() {}

int main(int ac, char* av[])
{
        glutInit(&ac, av);
        glutInitDisplayMode(GLUT_SINGLE|GLUT_RGB);
        glutWindowSize(500, 500);
        glutWindowPosition(100,200);
        glutCreateWindow("LINE");
        myInit();

        glutMouseFunc(myMouse);
                glutDisplayFunc(display);
        glutMainLoop();
}
```