

Bresenham's Line Drawing Algorithm

Step 1: Start.

Step 2: Declare variables x_1, x_2, y_1, y_2 , label x, label y, $\Delta x, \Delta y$, P, x and y.

Step 3: Calculate

$$\Delta x = |x_2 - x_1|$$

$$\Delta y = |y_2 - y_1|$$

Step 4: If $x_2 > x_1$, assign label x = 1, else label x = -1

Step 5: If $y_2 > y_1$, assign label y = 1, else label y = -1

Step 6: Plot x_1, y_1

Step 7: If $\Delta x > \Delta y, p_0 = 2\Delta y - \Delta x$

If ($p_k < 0$) then

$$x_{k+1} = x_k + \text{label } x$$

$$y_{k+1} = y_k$$

$$p_{k+1} = p_k + 2\Delta y$$

Else ($p_k > 0$) then

$$x_{k+1} = x_k + \text{label } x$$

$$y_{k+1} = y_k + \text{label } y$$

$$p_{k+1} = p_k + 2\Delta y - 2\Delta x$$

Else $\Delta x < \Delta y, p_0 = 2\Delta x - \Delta y$

If ($p_k < 0$) then

$$x_{k+1} = x_k$$

$$y_{k+1} = y_k + \text{label } y$$

$$p_{k+1} = p_k + 2\Delta x$$

Else ($p_k > 0$) then

$$x_{k+1} = x_k + \text{label } x$$

$$y_{k+1} = y_k + \text{label } y$$

$$p_{k+1} = p_k + 2\Delta x - 2\Delta y$$
$$\textit{plot}(x_{k+1}, y_{k+1})$$

Step 8: Stop