BRESENHAM'S LINE ALGORITHM

Input: Starting point (x1, y1), Ending point (x2, y2)

1. Calculate Differences:

$\Delta x = |x2 - x1|$

$\Delta y = |y2 - y1|$

2. Determine Line Orientation:

If $\Delta x >= \Delta y$:

Line has a shallow slope

Else:

Line has a steep slope

3. Set Step Directions:

$S_X = 1$ if $x2 > x1$,

$S_X = -1$ if $x2 < x1$

$S_Y = 1$ if $y2 > y1$,

$S_Y = -1$ if $y2 < y1$

4. Initialize Decision Parameter:

If shallow slope:

$err = 2\Delta y - \Delta x$

Else:

$err = 2\Delta x - \Delta y$

5. Plot Initial Point:

Plot (x, y) = (x1, y1)

6. Iterate Until Endpoint:

If shallow slope:

For x from x1 to x2:

Plot (x, y)

If err >= 0:

$y \mathrel{+}= S_Y$

$err \mathrel{-}= 2\Delta x$

$err \mathrel{+}= 2\Delta y$

Else:

For y from y1 to y2:

Plot (x, y)

If err >= 0:

$x \mathrel{+}= S_X$

$err \mathrel{-}= 2\Delta y$

$err \mathrel{+}= 2\Delta x$

7. Terminate:

Stop when (x, y) = (x2, y2)

Output: Sequence of plotted points forming the line