The Bresenham Line Algorithm (For +ve slope and 0<m<1)

BRESENHAM'S LINE DRAWING ALGORITHM
(for $|m| < 1.0$)

1. Input the two line end-points, storing the left end-point in (x_0, y_0)
2. Plot the point (x_0, y_0)
3. Calculate the constants dx, dy, $2dy$, and $(2dy - 2dx)$ and get the first value for the decision parameter as:

$$p_0 = 2dy - dx$$

4. At each x_k along the line, starting at $k = 0$, perform the following test. If $p_k < 0$, the next point to plot is (x_k+1, y_k) and:

$$p_{k+1} = p_k + 2dy$$

The Bresenham Line Algorithm (cont…)

Otherwise, the next point to plot is (x_k+1, y_k+1) and:

$$p_{k+1} = p_k + 2dy - 2dx$$

5. Repeat step 4 (dx – 1) times

The Bresenham Line Algorithm (For +ve slope and m>1)

BRESENHAM'S LINE DRAWING ALGORITHM
(for $|m| > 1.0$)

1. Input the two line end-points, storing the left end-point in (x_0, y_0)
2. Plot the point (x_0, y_0)
3. Calculate the constants dx, dy, $2dx$, and $(2dx - 2dy)$ and get the first value for the decision parameter as:

$$p_0 = 2dx - dy$$

4. At each y_k along the line, starting at $k = 0$, perform the following test. If $p_k < 0$, the next point to plot is $(x_k, y_k + 1)$ and:

$$p_{k+1} = p_k + 2dx$$

The Bresenham Line Algorithm (cont…)

Otherwise, the next point to plot is (x_k+1, y_k+1) and:

$$p_{k+1} = p_k + 2dx - 2dy$$

5. Repeat step 4 (dy – 1) times