DDA LINE ALORITHM (Digital Differential Analyzer)

Slope intercept eqn of line is

y = mx + b

where m is slope, and b is y intercept

m = (y2 – y1) / (x2 – x1) = Dy / Dx

**Case 1:** for m < 1 (Dy < Dx), positive gentle slope (less than 45 degrees)

m = Dy / Dx

Dy = m . Dx

(ya + 1) – ya = m . [(xa + 1) – xa]

(ya + 1) – ya = m . (1)

(ya + 1) = m + ya

ynew = m + yold

xnew = 1 + xold

**Case 2:** for m > 1 (Dy > Dx), positive slope (greater than 45 degrees)

m = Dy / Dx

Dx = Dy / m

(xa + 1) – xa = [(ya + 1) – ya] / m

(xa + 1) – xa = 1 / m

(xa + 1) = xa  + 1 / m

xnew = 1 / m + xold

ynew = 1 + yold

**Case 3:** for m = 1, Dy = Dx, slope = 45 degrees.

m = Dy / Dx

1 = Dy / Dx

Dy = Dx

ynew = 1 + yold

xnew = 1 + xold

**DDA LINE ALORITHM (Digital Differential Analyzer)**

1. Accept two end points of line: (xa, ya), (xb, yb)
2. Find horizontal and vertical difference between end points: Dx = xb - xa, Dy = yb - ya
3. Difference between greater magnitude determines the value of parameter steps.
4. Determine the offset needed at each step i.e. to generate the next pixel loop through this step times
5. Before displaying every point round off the point to its nearest integer value.
6. | Dx | > | Dy |, xa < xb,

Xinc = 1

Yinc = m

1. | Dx | > | Dy |, xa > xb

Xinc = -1

Yinc = -m

1. | Dy | > | Dx |,ya < yb,

Yinc = 1

Xinc = 1/m

1. | Dy | > | Dx |,ya > yb,

Yinc = -1

Xinc = -1/m