1. Implement Digital Differential Analyzer Line drawing algorithm.

***Algorithm:***

1. Given, two end points: *(x1, y1)* and *(x2, y2)*.
2. Calculate: *dx = x2 – x1* and *dy = y2 – y1*
3. If *|dx| > |dy|*, *step-size = |dx|*Else, *step-size = |dy|*
4. Calculate:
5. Set *x = x1* and *y = y1*. Then, plot *(x, y)*.
6. Until step-size
   1. *x = x + xinc*
   2. *y = y + yinc*
   3. Plot *(x, y)*.
7. Implement Bresenham Line Drawing algorithm for both slopes (|m|<1 and |m|>=1).

***Algorithm for |m| < 1:***

1. Given, two end points: *(x1, y1)* and *(x2, y2)* as starting and final points.
2. Set *x = x1* and *y = y1*. Then, plot *(x, y)*.
3. Calculate *Δx, Δy, 2Δy* and *(2Δy – Δx),* and obtain the starting value for the decision parameter as *P0 = 2Δy – Δx.*
4. At each *xk,* along the line starting at *k = 0*, perform the following tests:

If *Pk < 0,*

1. Plot *(xk + 1, yk)*
2. *Pk+1 = Pk + 2Δy*

Else,

1. Plot *(xk + 1, yk + 1)*
2. *Pk+1 = Pk + 2Δy - 2Δx*
3. Repeat step (iv) till *Δx* times.

***Algorithm for |m| >= 1:***

1. Given, two end points: *(x1, y1)* and *(x2, y2)* as starting and final points.
2. Set *x = x1* and *y = y1*. Then, plot *(x, y)*.
3. Calculate *Δx, Δy, 2Δx* and *(2Δx – Δy),* and obtain the starting value for the decision parameter as *P0 = 2Δx – Δy.*
4. At each *yk,* along the line starting at *k = 0*, perform the following tests:

If *Pk < 0,*

1. Plot *(xk, yk + 1)*
2. *Pk+1 = Pk + 2Δx*

Else,

1. Plot *(xk + 1, yk + 1)*
2. *Pk+1 = Pk + 2Δx - 2Δy*
3. Repeat step (iv) till *Δy* times.
4. Implement Midpoint algorithm Line drawing for both slopes (|m|<1 and |m|>=1).

***Algorithm for |m| < 1:***

1. Given, two end points: *(x1, y1)* and *(x2, y2)* as starting and final points.
2. Set *x = x1* and *y = y1*. Then, plot *(x, y)*.
3. Calculate *Δx, Δy* and obtain the starting value for the decision parameter as *.*
4. At each *xk,* along the line starting at *k = 0*, perform the following tests:

If *Pk < 0,*

1. Plot *(xk + 1, yk)*
2. *Pk+1 = Pk + Δy*

Else,

1. Plot *(xk + 1, yk + 1)*
2. *PK + 1 = Pk + Δy - Δx*
3. Repeat step (iv) till *Δx* times.

***Algorithm for |m| >= 1:***

1. Given, two end points: *(x1, y1)* and *(x2, y2)* as starting and final points.
2. Set *x = x1* and *y = y1*. Then, plot *(x, y)*.
3. Calculate *Δx, Δy,* and obtain the starting value for the decision parameter as *.*
4. At each *yk,* along the line starting at *k = 0*, perform the following tests:

If *Pk < 0,*

1. Plot *(xk, yk + 1)*
2. *Pk+1 = Pk + Δx*

Else,

1. Plot *(xk + 1, yk + 1)*
2. *Pk+1 = Pk + Δx - Δy*
3. Repeat step (iv) till *Δy* times.