

# **COMPUTER GRAPHICS**

## **(E2UC402B)**

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# Line Drawing Algorithms

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graph TD; A[Line Drawing Algorithms] --> B[DDA]; A --> C[Bresenham]
```

The diagram is a simple tree structure. At the top is a light green rounded rectangle containing the text 'Line Drawing Algorithms'. Two black arrows originate from the bottom center of this rectangle and point downwards and outwards to two separate light red rounded rectangles. The left rectangle contains the text 'DDA' and the right rectangle contains the text 'Bresenham'.

**DDA**

**Bresenham**

# DDA Line Drawing Algorithm

## (Digital Differential Analyzer)

Step 1: Enter the value of starting point  $(X_1, Y_1)$  and end point  $(X_2, Y_2)$

Step 2:  $X_k = X_1$  and  $Y_k = Y_1$

Step 3: Calculate the slope of line i.e.  $m$

$$m = (Y_2 - Y_1) / (X_2 - X_1)$$

Step 4: Check value of  $m$

# DDA Line Drawing Algorithm

Step 5: If  $m == 1$  CASE I

Step 6: for (  $x_k = x_1$ ;  $x_k \leq x_2$ ;  $x_k++$  )

Plot the point  $x_k$  and  $y_k$

$y_k = y_k + 1$

# DDA Line Drawing Algorithm

Step 7: If  $m < 1$  CASE II

Step 8: for (  $x_k = x_1$ ;  $x_k \leq x_2$ ;  $x_k++$  )

Plot the point  $x_k$  and  $(abs) y_k$

$y_k = y_k + m$

# DDA Line Drawing Algorithm

Step 9: If  $m > 1$  CASE III

Step 10: for (  $y_k = y_1$ ;  $y_k \leq y_2$ ;  $y_k++$  )

Plot the point (abs)  $x_k$  and  $y_k$

$x_k = x_k + 1/m$

Step 11: Exit

# Advantage & Disadvantage

## Advantage

1. Not Require advance skill
2. Fast method for line generation

## Disadvantage

More computation is required in case of floating point arithmetic operation

*Any*  
**QUESTION**  
*OR*  
**DOUBT**

