# Computer Graphics and Animation -L4

SYIT

By- Madhavi A, Rohini D

# SCAN CONVERSION ALGORITHM

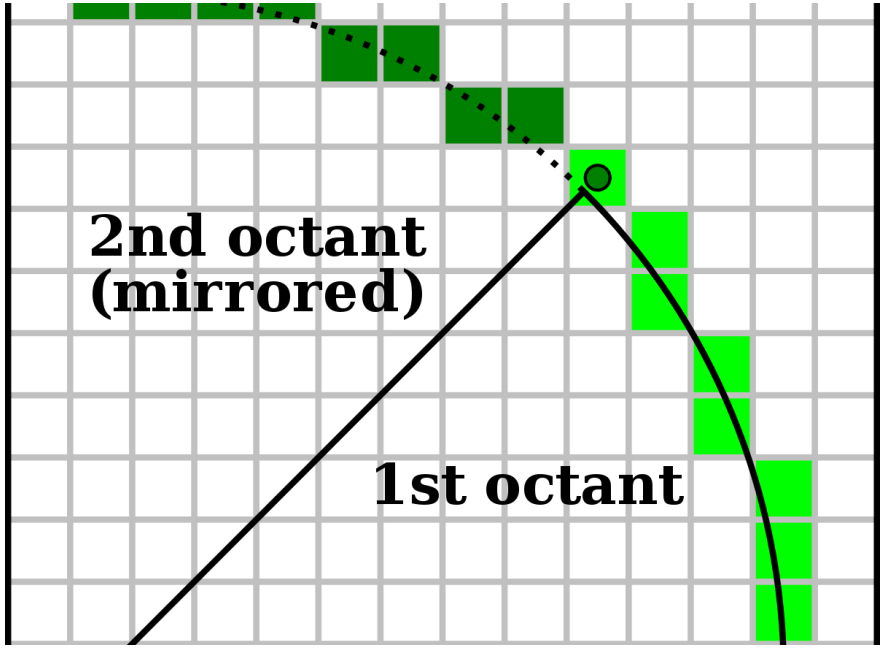
# Scan Conversion

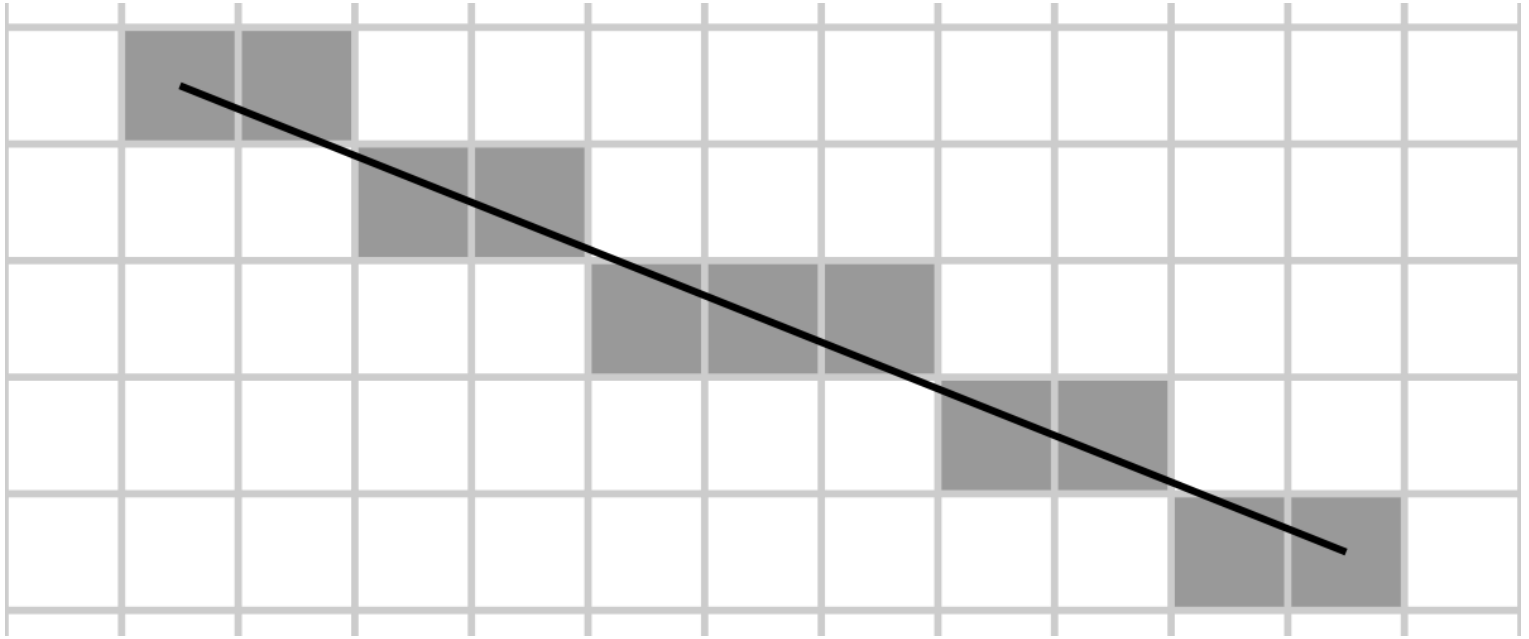
It is a general form for drawing methods, which create raster images according to picture primitives.

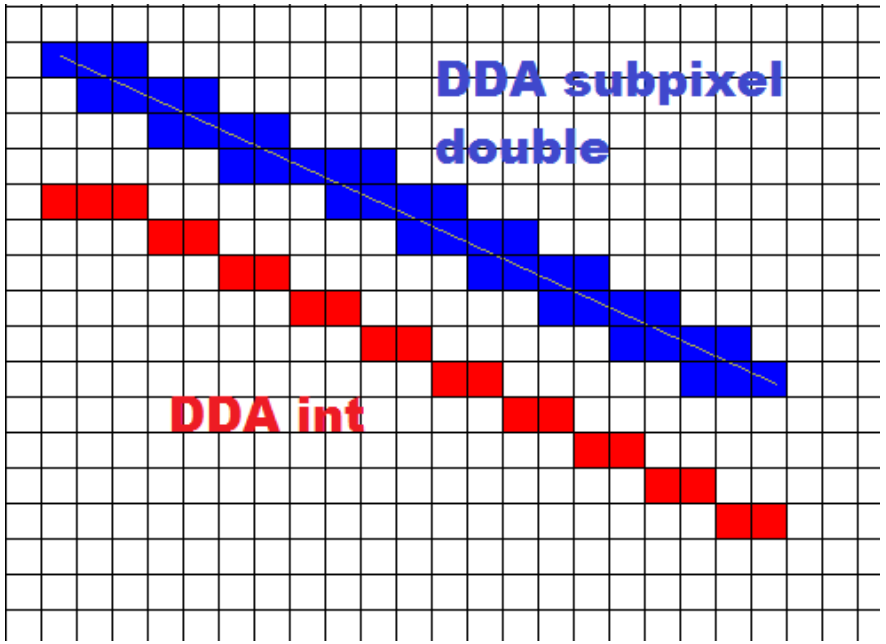
2D picture elements.

The process to determine which pixel provides the best approximation to shape the object is called as rasterization.

when rasterization is combined with picture generation using scan line is called as Scan Conversion.






- DDA Line Drawing
- Bresenham’s Line Drawing
- Bresenham’s Circle Drawing
- Midpoint Circle Drawing

# Digital differential Analyzer(DDA) Algorithm-

**1: Input the coordinates of the two end-points $A(x_1,y_1)$ & $B(x_2,y_2)$ for the line AB respectively.**

**2: Calculate $dx=x_2-x_1$ & $dy=y_2-y_1$**

**3: Calculate the length L**

- **if $abs(x_2-x_1) >= abs(y_2-y_1)$ then $L=abs(x_2-x_1)$**
- **else $L=abs(y_2-y_1)$**

**4: Calculate the incremental factor**

- **$\Delta x = (x2-x1)/L$**
- **$\Delta y = (y_2-y_1)/L$**

5: Initialize **the initial point on the line & plot**

- **$x = x_1 + 0.5$ & $y = y_1 + 0.5$**

6: Initialize i =1

While(i<=Length)

- {
- x =x +  Δx
- y = y + Δ y
  - plot(Integer x , Integer y)
  - i=i+1}

7: Finish

# Advantages and Disadvantages

## Advantages

- Simple & fast
- Does not require special skills for implementing it in any programming language

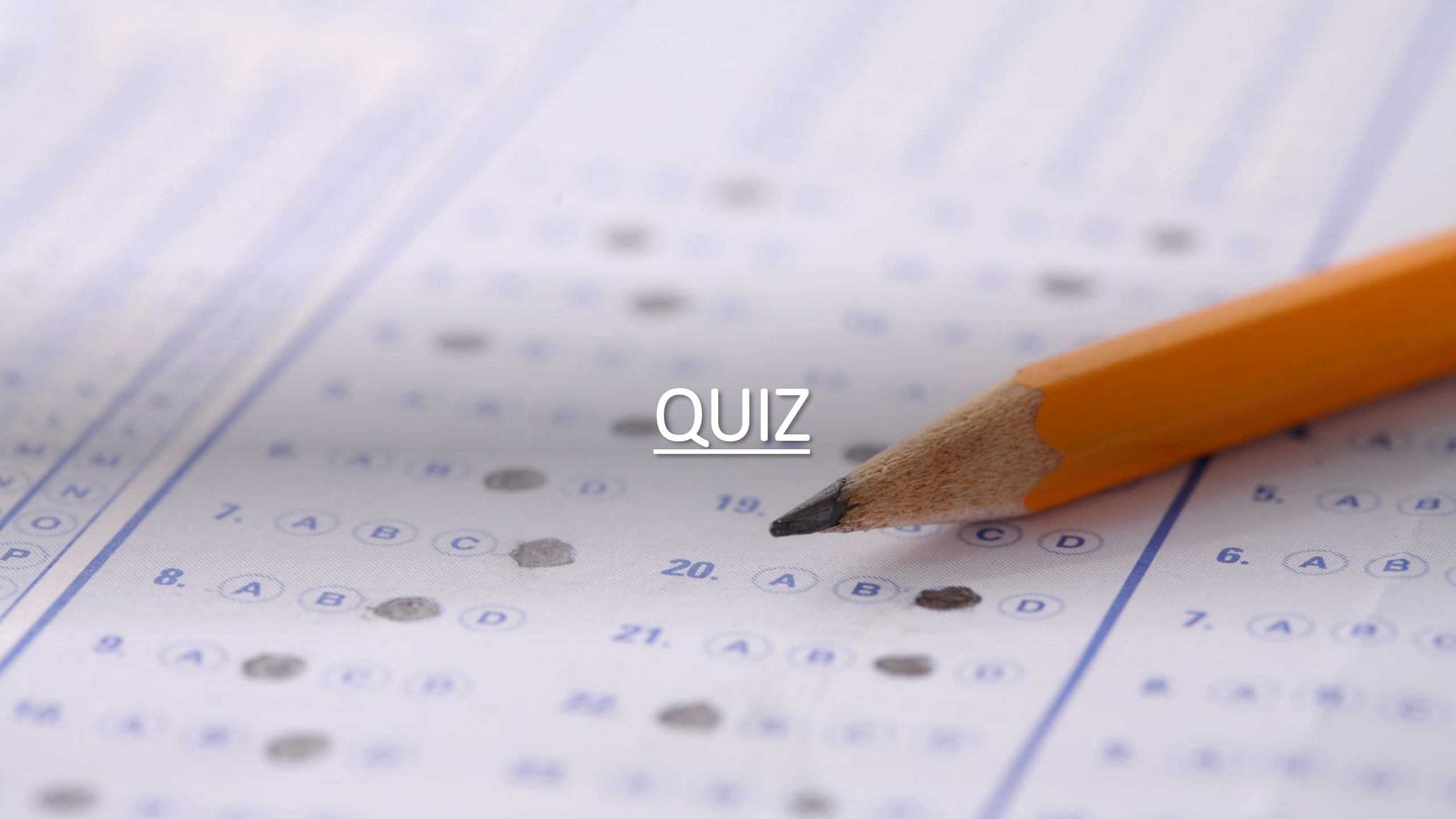
## Disadvantages

- Rounding off errors may drift the pixel away from the actual pixels.

# Examples

| | |
|---|---|
| 1 | Consider the line from (0,0) to (4,6). Use the simple DDA algorithm to rasterize this line. |
| 2 | Consider the line from (2,3) to (6,15). Use the simple DDA algorithm to rasterize this line. |
| 3 | Calculate the points between the starting point (5, 6) and ending point (8, 12). |
| 4 | Calculate the points between the starting point (5, 6) and ending point (13, 10). |
| 5 | Calculate the points between the starting point (1, 7) and ending point (11, 17). |

# QUIZ




Thank You