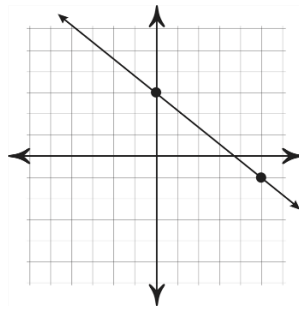


## DDA Line Drawing Algorithm & Line Class



A line connects two points. It is a basic element in graphics. To draw a line, you need two points between which you can draw a line.

Digital Differential Analyzer (DDA) algorithm is the simple line generation algorithm which is explained step by step here.

Step 1 – Get the input of two end points  $(X_1, Y_1)$  and  $(X_2, Y_2)$

Step 2 – Calculate the difference between the x components(dx) and the y components(dy) of the end points.

Step 3 – Based on the calculated difference in Step-2, you need to identify the number of steps to put pixels. If  $dx > dy$ , then you need more steps in x coordinate; otherwise in y coordinate.

Step 4 – Calculate the increment needed for the x coordinate and the y coordinate.

Step 5 – Put the pixels by successfully incrementing x and y coordinates accordingly and complete the drawing of the line.

Task: Create a line class, the line class should use the DDA algorithm to create the line.

### Line Class Schematics

#### Constructor

Constructor 1 should accept 2 Point instances.

Constructor 2 should accept no points.

Constructor 3 should accept 4 integers corresponding to the two coordinates

#### Private Fields

\_p0 Point

\_p1 Point

\_slope Real

\_midpoint Point

#### Public Properties - (don't use auto properties)

P0 (get & set) - the start point of the line

P1 (get & set) - the end point of the line

Slope (get only) - calculate & returns the slope of the line

Midpoint (get only) - calculate & returns the midpoint of the line

#### Public Methods

Draw() - draws the line.

Perturb(xmin, xmax, ymin ymax) - randomly moves the endpoints within the range of the parameters.

Collapse() - collapses the line to its mid-point