Computer Graphics Lab
Lab 1 Manual

Let's assume, we will generate a line segment, given 2 endpoints of it.

$$P_1 \equiv (2, 6)$$
$$P_2 \equiv (6, 13)$$

(You can multiply both points with any arbitrary constant if necessary to fit within the limit you've declared for your window. If you do, mention the constant, converted endpoints, and the rest of the plotted points in your report)

[You need to submit your source files for Task 1 and Task 2. Also, you'll need to submit a report in .txt format where you will mention the coordinates of the points in Task 1 and Task 2. Also, mention which approach you took for Task 2.
Write Task 3 in the report.
Don't zip the files, just add and hand in the assignment. Name the source file mentioning your registration number.
*** Provide screenshots also of your output for Task 1 and Task 2]*

Task 1: 30%

Scan-convert the line segment using DDA Algorithm.

[Hint: Have a look at the slope, *m,* and implement accordingly]

Task 2: 60%

Scan-convert the line segment using Bresenham's Algorithm.

[Hint:

Option 1:

As for lines that have m values other than $0 < m < 1$, we can make use of the fact that they can be mirrored either horizontally, vertically, or diagonally into this 0° to 45° angle range. For example, a line from (x'_1, y'_1) to (x'_2, y'_2) with $-1 < m < 0$ has a horizontally mirrored counterpart from $(x'_1, -y'_1)$ to $(x'_2, -y'_2)$ with $0 < m < 1$. We can simply use the algorithm to scan-convert this counterpart, but negate the y coordinate at the end of each iteration to set the right pixel for the line. For a line whose slope is in the 45° to 90° range, i.e., $m > 1$, we can obtain its mirrored counterpart by exchanging the x and y coordinates of its endpoints. We can then scan-convert this counterpart but we must exchange x and y in the call to project the points.

Option 2 (Only for lines with $m > 1$):

You can do some algebra and find the expressions for the Bresenham's algorithm taking $y_{i+1} = y_i + 1$ and calculating the recursive function for x_{i+1} accordingly.
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Task 3: 10%

Briefly discuss the comparison of these 2 algorithms. Which one to choose? Why?