ICB 1411 COMPUTER GRAPHICS PRACTICAL

Implement Scan Conversion Algorithms for Drawing Lines and Circles

Implement the Bresenham's line drawing algorithm and the midpoint circle drawing algorithm using Python.

a) Line Drawing Algorithm (Bresenham's Algorithm)
Write a function that accepts two endpoints of a line and uses Bresenham's algorithm to draw the line. The line must be plotted on a 2D grid using a plotting function such as `matplotlib`. The program should handle lines with positive and negative slopes.
b) Circle Drawing Algorithm (Midpoint Circle Algorithm)
Write a function that accepts the center coordinates and radius of a circle, and use the midpoint circle drawing algorithm to draw the circle on a 2D grid.

Required:

1. *Combine both algorithms to draw an image that consists of multiple lines and circles.*
2. *Add functionality to let the user input a set of lines (in terms of endpoints) and circles (in terms of center and radius).*
3. *Plot all the input shapes on the same canvas using Python's* `matplotlib` *library.*
4. *You are required to implement the algorithms step-by-step.*
5. *Use a grid size of 500x500 pixels.*
6. *Make sure to display the final output with all lines and circles plotted on the same grid.*
7. *Optionally, color the lines and circles differently.*