COMPUTER GRAPHICS ASSIGNMENT - 5

REPORT

Name: Akhil Jonnalagadda
Student Id: 02107382

About the code:

- This program allows users to draw geometric shapes like lines, circles, ellipses, and curves Bezier, B-Spline, Hermite on an HTML5 canvas using mathematical algorithms.
- It uses the DDA algorithm to draw lines, the Midpoint algorithm to draw circles and ellipses, and mathematical formulas to draw different types of curves.
- This program supports two rendering methods, one using canvas primitives for consistent and smooth shapes, and another using point by point drawing for more control and customization.
- User can input radius, control points, and coordinates, and adjust the color of drawing and line thickness using a color picker and a number box.

Issues Faced:

- I had difficulty implementing the Undo and Redo functionality, as the canvas did not always return to the correct previous state.
- I had faced issues when users left input fields empty or entered invalid values, which sometimes caused shapes to not appear on the canvas.
- I had faced some issues while drawing smooth curves like Bezier and Hermite, making sure the selected color and line width were applied correctly, and keeping the background white when saving the canvas as an image.

Lessons Learned:

- I learned how to use mathematical algorithms like Midpoint for lines, circles, and ellipses, along with parametric equations to compute and render geometric shapes accurately.
- I understood how to manage canvas history using toDataURL() for implementing Undo and Redo functionality effectively.
- Gained experience using Canvas API functions such as lineTo(), arc(), ellipse(), and bezierCurveTo() to create clean and smooth shapes with built-in drawing methods.
- I improved user interaction by adding features like a color picker, line width input, and image saving, and I also organized my code better by separating the drawing logic, user input handling, and canvas state management into clear and manageable parts.

Remaining Bugs:

There are no bugs in this program. All features, including shape drawing, color selection, line thickness adjustment, undo, redo, clear canvas, and image saving, are working perfectly without any issues.

Additional Functionalities:

I have added extra features like Undo, Redo, Clear Canvas, Color Picker, Line Width Control, and Save as PNG. I also implemented two different drawing approaches one using manual algorithms and another using Canvas built-in functions for smoother shape rendering.