

## Building A Functional Drawing Application in HTML5 Canvas

**Objective:** You will enhance a basic drawing application using HTML, CSS, and JavaScript. You will be given a starter project that includes the HTML structure, CSS styles, and a skeleton JavaScript setup. Your main tasks will focus on implementing the functionality of the drawing tools, including different shapes, line width adjustment, and a clear canvas feature.

### Instructions:

1. Fork the CodePen:

You will start with the provided [CodePen](#) that contains the HTML, CSS, and a basic JavaScript structure. Make sure to fork it to your own account to make changes.

2. Implement Drawing Functions:

You will be responsible for the following functionalities:

### Drawing Functions (70 points total):

Define the following functions:

- **drawPen(e) (10 points):** When the pen tool is selected, the user should be able to click and drag on the canvas to draw freehand lines.
- **drawRectangle(e) (10 points):** When the rectangle tool is selected, the user should be able to click and drag on the canvas to draw a rectangle.
- **drawCircle(e) (10 points):** When the circle tool is selected, the user should be able to click and drag on the canvas to draw a circle.
- **drawTriangle(e) (10 points):** When the triangle tool is selected, the user should be able to click and drag on the canvas to draw a triangle.
- **drawPentagon(e) (10 points):** When the pentagon tool is selected, the user should be able to click and drag on the canvas to draw a pentagon.
- **drawHexagon(e) (10 points):** When the hexagon tool is selected, the user should be able to click and drag on the canvas to draw a circle.
- **drawOctagon(e) (10 points):** When the octagon tool is selected, the user should be able to click and drag on the canvas to draw an octagon.

### Line Width Slider (10 points):

Implement a line width slider that allows users to adjust the thickness of the lines they draw. The slider's value should dynamically change the brush width as the user interacts with it.

**Clear Canvas Button (10 points):**

Implement the clear canvas functionality. When the "Clear Canvas" button is clicked, it should clear all drawings on the canvas and reset the background to its initial state.

**Code Quality (10 points):**

Make sure your code is clean and well-documented, following best practices for readability and maintainability.

Total Points: **100**

**Submission:**

You will have one week to complete this assignment.

When you have completed your assignment, **please submit the link to your CodePen project along with a brief reflection (1-2 paragraphs)** on the challenges you faced during implementation and how you overcame them.

**Additional Notes:**

- Make sure to test your application thoroughly to ensure all functionalities work as expected.
- Feel free to add any enhancements or features beyond what has been outlined for extra credit (up to 10 points). This can include saving drawings, additional shapes, or user-customizable options.