Lesson 8: Animation Functions with JavaScript (A4 Project)

Lesson Duration: ~ 2 hours

Lesson Goals:

- Deepen understanding of animation timing functions in JavaScript.
- Learn how to create smooth, interactive animations responsive to scrolling and user interaction.
- Apply these concepts practically by completing a scroll-based animation project (A4).

Part 1: Introduction to Animation Functions (30 min.)

- **Concept Explanation:**
  - What are animation timing functions?
  - How do timing functions affect animation smoothness and realism?
  - Common timing functions: linear, ease-in, ease-out, ease-in-out, custom functions.
- **Mark up:**
  - Animation refers to the process by which elements move or change dynamically over time or in response to user actions.
  - Mastering this technique enables you to create a wide variety of engaging and interactive animations.
- **Example Usage:**

```
function createAnimation(xStart, xEnd, yStart, yEnd) {
  return function (progress) {
    // Custom calculation based on progress
  };
}
```

Part 2: A4 Interactive Project – Scroll Animation (1 hours)

- **Project Objective:**
  - Create interactive animations triggered by scrolling:

        - Smoothly animate elements in and out based on scroll position.
- **Implementation Steps:**
    - Select and track DOM elements.
    - Implement `createAnimation` function:
        - Dynamically compute styles based on scroll position.
    - Use JavaScript events (`scroll`, `resize`) to update animations in real-time.
- **Key Functions and Logic:**

```
function updateAnimationMap() {
  // Calculate and store animations for each item
}

function updateStyles() {
  // Apply animations based on current scroll position
}
```

Part 3: Project Solution & Discussion (30 min.)

- **Solution Walkthrough:**
    - Instructor presents a comprehensive solution, highlighting key aspects:
        - Implementation of dynamic animation calculations.
        - Optimizing animations for performance and fluidity.
- **Discussion Points:**
    - Compare custom animation functions to CSS-based solutions.