

## Task 2

### Aim: Building a Stopwatch Web Application using html , css , JavaScript Theory:

#### 1. Understanding the Requirements

- The stopwatch should have the following features:
  - Start, Stop, and Reset buttons.
  - A display to show elapsed time in `hh:mm:ss` format.
  - Functionality to measure time accurately.
  - (Optional) A lap timer to record intermediate times.

#### 2. Breaking Down the Components

The stopwatch app consists of three main layers:

##### A. HTML (Structure)

- The HTML defines the structure of the app:
  - A display area to show the time.
  - Buttons for start, stop, and reset.

##### B. CSS (Styling)

- CSS styles the app to make it visually appealing.
  - Positioning of buttons and display.
  - Fonts, colors, and overall layout.

##### C. JavaScript (Logic & Interaction)

- JavaScript adds functionality to the stopwatch.
  - Keeping track of time using the `setInterval` function.
  - Handling user interactions like button clicks.
  - Resetting and updating the display.

#### 3. Functional Flow

- **Start:**
  - Start the timer by initiating a `setInterval` call.
  - Calculate elapsed time by incrementing seconds and converting them to minutes and hours as needed.
- **Stop:**
  - Clear the interval using `clearInterval` to pause the stopwatch.
- **Reset:**
  - Reset the time variables and update the display to `00:00:00`.
- **Lap (Optional):**

- Capture the current time without stopping the timer and display it in a list.

## 4. Implementation Details

### A. Timer Logic

- Use JavaScript's `Date` object or manual incrementation to track elapsed time.
- Convert total elapsed seconds into `hh:mm:ss` format.

### B. Button Handlers

- Attach `onclick` event listeners to buttons for:
  - Starting the timer.
  - Stopping the timer.
  - Resetting the timer.

### C. Performance Considerations

- Use `requestAnimationFrame` if precise timing is critical.
- Optimize DOM updates to prevent rendering lag.

## Code:

```
index.html X
C:\Users\USER\Desktop\Task_3> index.html > ...
1  <!DOCTYPE html>
2  <html lang="en">
3  <head>
4      <meta charset="UTF-8">
5      <meta name="viewport" content="width=device-width, initial-scale=1.0">
6      <title>Stopwatch</title>
7      <style>
8          body {
9              font-family: Arial, sans-serif;
10             background-color: #f4f4f9;
11             margin: 0;
12             padding: 0;
13             display: flex;
14             justify-content: center;
15             align-items: center;
16             height: 100vh;
17         }
18
19         .stopwatch {
20             background: #fff;
21             border: 2px solid #ddd;
22             border-radius: 10px;
23             box-shadow: 0 4px 8px rgba(0, 0, 0, 0.2);
24             padding: 20px;
25             text-align: center;
26             width: 300px;
27         }
28
29         .time {
30             font-size: 2.5rem;
31             margin: 20px 0;
32             color: #333;
33         }
34     </style>
35 </head>
36 <body>
37     <div class="stopwatch">
38         <div class="time">00:00:00</div>
39     </div>
40 </body>
41 </html>
```

**Output:**

A digital stopwatch interface. At the top, a large digital display shows the time 00:00:15.081. Below the display are four buttons: 'Start' (blue), 'Pause' (grey), 'Reset' (blue), and 'Lap' (blue). Below the buttons is a section titled 'Lap Times' which contains a list of three lap times: 00:00:04.010, 00:00:07.821, and 00:00:09.870.

00:00:15.081

Start Pause Reset

Lap

**Lap Times**

- 00:00:04.010
- 00:00:07.821
- 00:00:09.870