Java Script

What is JavaScript ?

- If HTML is the skeleton and CSS is the skin, **JavaScript (JS)** is the **brain**. It is the **language** that makes websites **interactive**. Without it, a website is just a static poster; with it, a website becomes an app.

- JavaScript handles things like clicking buttons to open menus, fetching live weather data, or validating a password before you hit **"submit**.“ Button.

How JavaScript Works ?

JavaScript usually **lives** inside a <script> tag in your HTML, or in a separate **.js** file. It works by "selecting" an HTML element and telling it to behave differently based on user actions.

Where to Put Your JavaScript?

Just like CSS, you have options:

1.Internal: Inside <script> tags at the bottom of your index.html (just before the closing </body> tag).

2.External: In a file named script.js, linked like this: <script src="script.js"></script>.

Why put it at the bottom?

Browsers read files from **top to bottom**. If you put your **JS** at the very top, it might try to "**grab**" an HTML button before that button has even been created! Putting it at the bottom ensures the "**skeleton**" is ready for the "**brain**" to take over.

1. Show Alert Message (Internal JavaScript)

```
<!DOCTYPE html>
<html>
<head>
   <title>Alert Example</title>
</head>
<body>

   <h2>Click the button</h2>
   <button onclick="showMessage()">Click Me</button>

   <script>
      function showMessage() {
         alert("Hello! This is JavaScript 😄");
      }
   </script>

</body>
</html>
```

2. Change Text on Button Click

```
<!DOCTYPE html>
<html>
<head>
   <title>Change Text</title>
</head>
<body>

   <h2 id="msg">Hello World</h2>
   <button onclick="changeText()">Change Text</button>

   <script>
      function changeText() {
         document.getElementById("msg").innerHTML = "Text changed using JavaScript!";
      }
   </script>

</body>
</html>
```

3. Simple Addition Calculator

```
<!DOCTYPE html>
<html>
<head>
   <title>Add Two Numbers</title>
</head>
<body>

   <h2>Addition Calculator</h2>

   <input type="number" id="num1" placeholder="Enter
number 1">
   <input type="number" id="num2" placeholder="Enter
number 2">
   <br><br>
   <button onclick="add()">Add</button>

   <h3 id="result">Result: </h3>
```

```
 <script>
       function add() {
          let a =
Number(document.getElementById("num1").value);
          let b =
Number(document.getElementById("num2").value);
          document.getElementById("result").innerHTML =
"Result: " + (a + b);
       }
    </script>

</body>
</html>
```

4. Show Current Time

```
<!DOCTYPE html>
<html>
<head>
   <title>Current Time</title>
</head>
<body>

   <h2>Click to see current time</h2>
   <button onclick="showTime()">Show Time</button>
   <h3 id="time"></h3>

   <script>
      function showTime() {
         let now = new Date();
         document.getElementById("time").innerHTML = now.toLocaleTimeString();
      }
   </script>

</body>
</html>
```

5. Change Background Colour

```
<!DOCTYPE html>
<html>
<head>
   <title>Change Background</title>
</head>
<body>

   <h2>Change Background Color</h2>
   <button onclick="changeColor()">Change Color</button>

   <script>
      function changeColor() {
         document.body.style.backgroundColor = "lightblue";
      }
   </script>

</body>
</html>
```

Internal JavaScript Example:

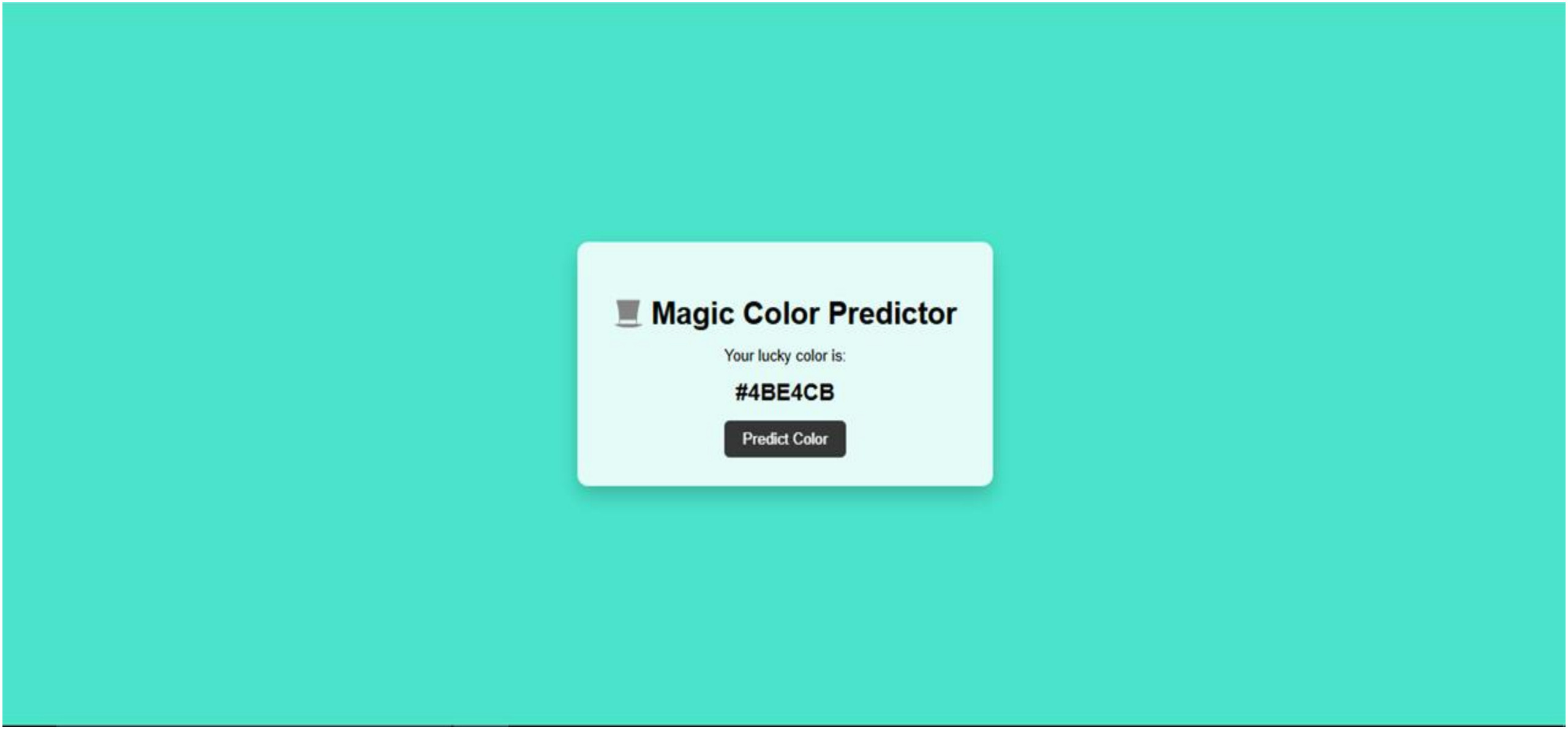
To demonstrate **Internal JavaScript**, we'll create a **"Magic Color Predictor."** In this example, everything (the structure, the style, and the logic) lives in one single **magic-color.html file**. This is perfect for small tools or experiments where you don't want to manage multiple files.

The "Magic Color Predictor“

This program does three things:

1.It generates a random Hexadecimal color code.
2.It applies that color to the background instantly.
3.It displays the color code on the screen so you can copy it.

Example: Magic Colour Predictor



```
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <title>Magic Color Predictor </title>

   <style>
      body {
         margin: 0;
         height: 100vh;
         display: flex;
         align-items: center;
         justify-content: center;
         font-family: Arial, sans-serif;
         transition: background-color 0.5s ease;
      }

      .container {
         background: rgba(255, 255, 255, 0.85);
         padding: 30px 40px;
         border-radius: 12px;
         text-align: center;
         box-shadow: 0 10px 20px rgba(0,0,0,0.2);
      }

      h1 {
         margin-bottom: 15px;
      }

      #colorCode {
         font-size: 24px;
         font-weight: bold;
         margin: 15px 0;
      }

      button {
         padding: 10px 20px;
         font-size: 16px;
         border: none;
         border-radius: 6px;
         cursor: pointer;
         background-color: #222;
         color: white;
      }

      button:hover {
         opacity: 0.9;
      }
```

```
</style>
</head>
<body>

  <div class="container">
    <h1>🎩 Magic Color Predictor</h1>
    <p>Your lucky color is:</p>
    <div id="colorCode">#FFFFFF</div>
    <button onclick="generateColor()">Predict Color</button>
  </div>

  <script>
    function generateColor() {
      let hex = "#";
      let characters = "0123456789ABCDEF";

      for (let i = 0; i < 6; i++) {
        hex += characters[Math.floor(Math.random() * 16)];
      }

      // Apply color to background
      document.body.style.backgroundColor = hex;

      // Show color code on screen
      document.getElementById("colorCode").innerText = hex;
    }

    // Generate one color automatically when page loads
    generateColor();
  </script>

</body>
</html>
```

External JavaScript Example:

The Dark Mode Toggle : This is the most common feature on modern sites. It switches a CSS class on the <body> tag when you click a button.

a. The HTML File (index.html) : This file sets up the structure and links to both your style sheet and your logic script.

```
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <meta name="viewport" content="width=device-width, initial-
scale=1.0">
   <title>Interactive JS Dashboard</title>
   <link rel="stylesheet" href="style.css">
</head>
<body>

   <div class="container">
      <div class="card">
         <div id="clock">00:00:00</div>
         <p>Current Local Time</p>
      </div>

      <div class="card">
         <h1>Welcome!</h1>
         <input type="text" id="userName" placeholder="What's
           your name?">
         <button onclick="sayHello()">Update Greeting</button>
         <h2 id="greetingText">Hello, Guest!</h2>
      </div>

      <div class="card">
         <p>Appearance</p>
         <button class="toggle-btn" onclick="toggleTheme()“ >
            Switch Light/Dark Mode</button>
      </div>
   </div>

   <script src="script.js"></script>
</body>
</html>
```

b. CSS File (style.css): This file handles the "Glassmorphism" look and the smooth transitions for the Dark Mode.

```
/* Variables for easy theme switching */
:root {
    --bg-color: #e0eafc;
    --card-bg: rgba(255, 255, 255, 0.7);
    --text-color: #333;
    --accent-color: #007bff;
}

/* Dark Mode Variables */
.dark-mode {
    --bg-color: #1a1a2e;
    --card-bg: rgba(255, 255, 255, 0.1);
    --text-color: #ffffff;
    --accent-color: #4cc9f0;
}

body {
    background: var(--bg-color);
    color: var(--text-color);
    font-family: 'Segoe UI', sans-serif;
    display: flex;
    justify-content: center;
    align-items: center;
    min-height: 100vh;
    margin: 0;
    transition: background 0.5s ease;
}

.container {
    display: flex;
    flex-direction: column;
    gap: 20px;
    width: 350px;
}

.card {
    background: var(--card-bg);
    backdrop-filter: blur(10px);
    padding: 25px;
    border-radius: 20px;
```

```
 box-shadow: 0 10px 30px rgba(0,0,0,0.1);
    text-align: center;
    border: 1px solid rgba(255, 255, 255, 0.2);
}

#clock {
    font-size: 2.5rem;
    font-weight: bold;
    color: var(--accent-color);
}

input {
    padding: 10px;
    width: 80%;
    border-radius: 8px;
    border: 1px solid #ccc;
    margin-bottom: 10px;
}
```

```
button {
    background: var(--accent-color);
    color: white;
    border: none;
    padding: 12px 20px;
    border-radius: 8px;
    cursor: pointer;
    font-weight: bold;
    transition: 0.3s;
}

button:hover {
    opacity: 0.8;
    transform: scale(1.05);
}
```

c. The JavaScript File (script.js) This file is the "**brain**" that controls the interactive elements.

```
// 1. LIVE CLOCK FUNCTION
function updateClock() {
    const now = new Date();
    const timeString = now.toLocaleTimeString();
    document.getElementById('clock').textContent = timeString;
}

// Run clock every second
setInterval(updateClock, 1000);
updateClock(); // Initial call so it doesn't wait 1 second to start


// 2. GREETING FUNCTION
function sayHello() {
    const input = document.getElementById('userName');
    const display = document.getElementById('greetingText');

    if (input.value.trim() !== "") {
        display.textContent = `Hello, ${input.value}! 👋`;
        input.value = ""; // Clear input after clicking
    } else {
        alert("Please enter a name first!");
    }
}


// 3. THEME TOGGLE FUNCTION
function toggleTheme() {
    // This looks at the <body> and
adds/removes
        //the 'dark-mode' class
    document.body.classList.toggle('dark-mode');
}
```