# JavaScript Guide

## 4. JavaScript

### 4.1 Basics of JavaScript

#### 4.1.1 JavaScript Introduction

* **JavaScript**: A versatile, high-level, interpreted programming language used primarily for adding interactivity to web pages.
* **Features**:
  + **Client-Side Scripting**: Runs directly in the browser, enhancing user experience.
  + **Object-Based**: Provides built-in objects like window and document.
* **Example**:
* **<script>**  
   alert("Welcome to JavaScript!");  
  **</script>**
* **Usage**: All modern browsers support JavaScript, making it essential for web development.

#### 4.1.2 Use of JavaScript

* **Enhance Interactivity**: Create dynamic content such as form validation, animations, and event handling.
* **Example**: Show an alert when a button is clicked.
* **<button** **onclick**="showMessage()"**>**Click Me**</button>**  
    
  **<script>**  
   **function** showMessage() {  
   alert("Button clicked!");  
   }  
  **</script>**

#### 4.1.3 Ways to Include JavaScript

* **Inline JavaScript**: Directly in the HTML tag.
* **<button** **onclick**="alert('Hello!')"**>**Click Me**</button>**
* **Internal JavaScript**: Inside a <script> tag within the HTML document.
* **<script>**  
   console.log("Internal JavaScript example");  
  **</script>**
* **External JavaScript**: In a separate file with a .js extension.
* **Example**: script.js
* console.log("External JavaScript example");
* **Include in HTML**:
* **<script** **src**="script.js"**></script>**

#### 4.1.4 Syntax of JavaScript

* **Statements**: Instructions like let x = 5;.
* **Variables**: Using let, const, or var to store data.
* **let** name = "John";  
  **const** age = 30;  
  **var** isStudent = **false**;
* **Comments**:
  + Single-line: // This is a comment
  + Multi-line: /\* This is a multi-line comment \*/

#### 4.1.5 Basic Events in JavaScript

* **Events**: Actions that occur in the browser, like clicks, mouse movement, or form submission.
* **Common Event Handlers**:
  + onclick: Triggers when an element is clicked.
  + **<button** **onclick**="alert('Clicked!')"**>**Click Me**</button>**
  + onmouseover: Triggers when the mouse is over an element.
  + **<div** **onmouseover**="console.log('Mouse is over!')"**>**Hover over me**</div>**
  + onload: Fires when the page has fully loaded.
  + **<body** **onload**="console.log('Page loaded!')"**></body>**

#### 4.1.6 Basic Validation with JavaScript

* **Form Validation**: Used to ensure that user input meets specific criteria before submitting.
* **Example**: Check if an input field is empty.
* **<form** **onsubmit**="return validateForm()"**>**  
   **<label** **for**="name"**>**Name:**</label>**  
   **<input** **type**="text" **id**="name" **name**="name" **/>**  
   **<input** **type**="submit" **value**="Submit" **/>**  
  **</form>**  
    
  **<script>**  
   **function** validateForm() {  
   **let** name = document.getElementById("name").value;  
   **if** (name === "") {  
   alert("Name must be filled out");  
   **return** **false**;  
   }  
   **return** **true**;  
   }  
  **</script>**
* **Explanation**: If the input field name is empty, an alert appears, and the form is not submitted. JavaScript Guide