**Web Technologies Laboratory 03**

**Aim: Client-side Form Validations using JavaScript, DOM real-time update, JQuery to develop Ajax based applications.**

**Aim:** Write a program to perform following form validations using JavaScript:

a) All fields mandatory,

b) Phone number, Email Address, Zip code Validation etc.

Include JavaScript to access and manipulate Document Object Model (DOM) objects in an HTML web page.

Include JQuery to develop to develop your application as an Ajax based application.

**Objectives:**

1. To understand what is form validation.
2. To learn basic functioning of DOM objects.
3. To learn how to apply various techniques to implement it.

**Theory:**

1. **Different types of form validations.**

Form validation ensures that the user submits the correct and expected data. There are two main types of form validation:

#### Client-Side Validation

* **HTML5 Validation Attributes:** Use attributes like required, minlength, maxlength, pattern, type (e.g., email, url), etc., to validate input fields directly in HTML.
* **JavaScript Validation:** Custom validation logic can be written using JavaScript to check input values and provide feedback before the form is submitted to the server.

#### Server-Side Validation

* Validation performed on the server after the form data has been submitted. It ensures that data remains consistent and secure regardless of client-side manipulations.

#### Examples:

* **Required Fields:** <input type="text" required>
* **Email Validation:** <input type="email" pattern="[a-z0-9.\_%+-]+@[a-z0-9.-]+\.[a-z]{2,}$">

1. **HTML Document Object Model.**

The HTML DOM is a programming interface for web documents. It represents the structure of a document and provides a way to access and manipulate the content, structure, and style of web pages.

#### Key Concepts:

* **Nodes:** Everything in an HTML document is a node, including elements, attributes, and text content.
* **Tree Structure:** The HTML DOM represents a document as a tree structure where each element is a node.
* **Accessing Elements:** JavaScript can be used to access and manipulate HTML elements via methods like getElementById, getElementsByClassName, getElementsByTagName, querySelector, and querySelectorAll.

1. **What is JQuery? Write various JQuery Selectors.**

jQuery is a fast, small, and feature-rich JavaScript library. It makes things like HTML document traversal and manipulation, event handling, and animation much simpler with an easy-to-use API that works across a multitude of browsers.

#### jQuery Selectors:

* **Basic Selectors:**
  + - $("element"): Selects all elements with the given tag name.
    - $("#id"): Selects the element with the specified id.
    - $(".class"): Selects all elements with the specified class.
* **Hierarchy Selectors:**
  + - $("parent child"): Selects all child elements within the specified parent.
    - $("parent > child"): Selects all direct child elements of the specified parent.
* **Attribute Selectors:**
  + - $("[attribute='value']"): Selects elements with the specified attribute and value.
    - $("[attribute\*='value']"): Selects elements with the specified attribute containing the value.
* **Form Selectors:**
  + - $(":input"): Selects all input, text area, select, and button elements.
    - $(":text"): Selects all input elements with type="text"

**FAQ:**

1. **Write 3 reasons why Form validations are important.**

* **Data Integrity:** Form validations ensure that the data submitted by users is in the correct format and meets the required criteria, thus maintaining the quality and integrity of the data. For example, validating email addresses ensures that the input is in the correct email format.
* **Security:** Validations help to protect against malicious inputs and potential security threats like SQL injection, cross-site scripting (XSS), and other forms of attacks by ensuring that only properly formatted and expected data is processed.
* **User Experience:** Validations provide immediate feedback to users about errors or omissions in their input, guiding them to correct mistakes before submitting the form. This improves the overall user experience by preventing the frustration of form submission errors.

1. **Give an example of how to modify an attribute value using DOM.**

* To modify an attribute value using the DOM, you can use the setAttribute method or directly change the property of the element. Here's an example:

<body>

<img id="myImage" src="old-image.jpg" alt="Old Image">

<button type="button" onclick="changeImage()">Change Image</button>

<script>

function changeImage() {

var image = document.getElementById("myImage");

image.setAttribute("src", "new-image.jpg");

image.alt = "New Image";

}

</script>

</body>

* In this example, clicking the button changes the src attribute of the image from "old-image.jpg" to "new-image.jpg" and also updates the alt attribute.

1. **What is jQuery Ajax?**

jQuery Ajax is a set of methods in jQuery that allow you to perform asynchronous HTTP requests. Ajax (Asynchronous JavaScript and XML) enables web pages to be updated asynchronously by exchanging small amounts of data with the server behind the scenes. This means that it is possible to update parts of a web page, without reloading the whole page.

#### Key Methods:

* **$.ajax():** The core Ajax method that provides a comprehensive set of options to configure the request.
* **$.get():** A shorthand method for performing HTTP GET requests.
* **$.post():** A shorthand method for performing HTTP POST requests.
* **$.getJSON():** A method for performing a GET request and expecting a JSON response.

**Output: Screenshots of the output to be attached.**

**Problem Statement:**

Write a program to design Student registration form by using HTML, CSS having following fields: Username, Email, Phone number, Password, Confirm Password and write external javascript code to achieve following validations

* Fields should not be empty. If spaces are entered those should be considered empty
* Phone number must accept only numeric values and it should be 10 digits
* Password length must be at least 7 and it should contain at least one capital letter, one digit and one special character from the set (&,$,#@)
* Value entered in password field and confirm password fields must match

Email address must contain @ sign and a ., there should be few letters before the @ sign, there should be three letters between @ sign and a . There must  be 3 or 2 letters after the  .   (hint: Use regular expression)

Write a client-side script with JavaScript to access and manipulate Document Object Model (DOM) objects in an HTML web page. Develop a dynamic web page using javascript and DOM. Make use of the following for accessing elements

* getElementById, getElementsByTagName,getElementsByClassName
* Change the text using innerHTML property
* Change the CSS properties like color, position of a particular element on the page
* Change the image source after clicking on a button
* Add a text node and attach it to a parent node
* Delete a node

Include jQuery to perform following operations:

* Change button text using jQuery.
* Set background-image using jQuery CSS property.
* Access HTML form data using jQuery.
* Add attribute using jQuery

Use this reference link for jQuery : https://www.w3resource.com/jquery-exercises/part1/index.php