

## 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:

Different types of form validations.

Ans : Form validations are essential to ensure that data submitted by users through web forms is accurate, complete, and meets specific criteria. Different types of form validations include:

- Required Field Validation: Ensures that mandatory fields are not left empty.
- Data Type Validation: Checks if the entered data matches the expected format, e.g., numeric, email, date, etc.
- Length Validation: Verifies if the input length falls within acceptable limits, e.g., minimum and maximum characters.
- Pattern Matching: Uses regular expressions to validate input based on a specific pattern.
- Comparative Validation: Compares two or more form fields to ensure they match, such as password and confirm password fields.
- Numeric Range Validation: Checks if a numeric input falls within a defined range.
- Date Validation: Ensures that dates entered are valid and meet criteria like being in the future or past.
- Email Validation: Verifies if an email address is in a valid format.
- Custom Validation: Allows developers to define custom validation rules based on specific requirements.

### HTML Document Object Model.

Ans: The HTML Document Object Model (DOM) is a programming interface for web documents. It represents the structure of a web page, allowing JavaScript and other scripting languages to access, manipulate, and modify the content and structure of HTML documents. The DOM organizes the document as a tree of

objects, where each HTML element becomes an object with properties and methods.

What is JQuery? Write various JQuery Selectors.

Ans: jQuery is a fast, lightweight, and feature-rich JavaScript library designed to simplify client-side scripting and interaction with HTML documents. It abstracts many of the complexities and inconsistencies of JavaScript, providing a simplified API for common tasks, such as DOM manipulation, event handling, animations, and AJAX requests.

Various jQuery Selectors:

jQuery selectors are used to select and manipulate HTML elements. Here are some common jQuery selectors:

**Element Selector:** Selects all elements with a specific HTML tag. For example: `$("p")` selects all `<p>` elements.

**ID Selector:** Selects an element by its id attribute. For example: `$("#myElement")` selects the element with `id="myElement"`.

**Class Selector:** Selects elements by their class attribute. For example: `$(".myClass")` selects all elements with `class="myClass"`.

**Attribute Selector:** Selects elements with a specific attribute. For example: `$("[data-attribute='value']")` selects elements with a data attribute matching a specific value.

**Descendant Selector:** Selects elements that are descendants of a specified element. For example: `$("div p")` selects all `<p>` elements inside `<div>` elements.

**Child Selector:** Selects elements that are direct children of a specified element. For example: `$("ul > li")` selects all `<li>` elements that are direct children of `<ul>`.

**Pseudo-class Selector:** Selects elements based on their state or position. For example: `$("input:checked")` selects checked `<input>` elements.

#### FAQ:

1. Write 3 reasons why Form validations are important.
2. Give an example of how to modify an attribute value using DOM.
3. What is jQuery Ajax?

#### FAQ Ans:

1:

a. Data Accuracy: Form validations ensure that the data submitted is accurate and reliable.

b. User Experience: It improves the user experience by providing real-time feedback and preventing errors.

c. Security: Validations protect against malicious input and help prevent security vulnerabilities.

2.

## javascript

### Copy code

```
// Suppose you have an image element with id "myImage"  
var imageElement = document.getElementById("myImage");
```

```
// Change the src attribute of the image  
imageElement.src = "new_image.jpg";
```

3.

jQuery Ajax is a set of methods and functions provided by jQuery for making asynchronous HTTP requests to a server. It simplifies the process of sending and receiving data from the server without requiring a full page reload. jQuery Ajax functions include \$.ajax(), \$.get(), \$.post(), and more, allowing developers to fetch data, update content, and interact with APIs without disrupting the user experience.

## 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>

**Code and Output for the 1st Problem Statement :**

**html:**

```
<!DOCTYPE html>
<html>
<head>
<title>Student Registration Form</title>
<style>
body {
font-family: Arial, sans-serif;
}

.container {
width: 400px;
margin: 0 auto;
padding: 10px;
border: 1px solid #ccc;
border-radius: 5px;
background-color: #f4f4f4;
}
```

```
label, input {
display: block;
margin-bottom: 10px;
}

input[type="submit"] {
background-color: #ff7b00;
color: #fff;
padding: 20px 20px;
border: none;
border-radius: 5px;
cursor: pointer;
}

input[type="submit"]:hover {
background-color: #e509c8;
}

.error {
color: red;
}

</style>
</head>
<body>
<div class="container">
<h2>Student Registration</h2>
<form id="registrationForm">
<label for="username">Username:</label>
<input type="text" id="username" name="username" required>
<label for="email">Email:</label>
<input type="text" id="email" name="email" required>
<label for="phone">Phone Number:</label>
<input type="text" id="phone" name="phone" required>
```

```
<label for="password">Password:</label>
<input type="password" id="password" name="password" required>
<label for="confirmPassword">Confirm Password:</label>
<input type="password" id="confirmPassword" name="confirmPassword"
required>
<input type="submit" value="Register">
</form>
<div id="errorMessages" class="error"></div>
</div>

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

javascript:

```
<script>

document.addEventListener("DOMContentLoaded", function () {
var registrationForm = document.getElementById("registrationForm");
var errorMessagesDiv = document.getElementById("errorMessages");

registrationForm.addEventListener("submit", function (event) {
event.preventDefault(); // Prevent form submission by default

// Get form field values
var username = document.getElementById("username").value;
var email = document.getElementById("email").value;
var phone = document.getElementById("phone").value;
var password = document.getElementById("password").value;
var confirmPassword = document.getElementById("confirmPassword").value;

// Reset error messages
errorMessagesDiv.innerHTML = "";
```

```
var errorMessages = [];

// Check if fields are empty or contain only spaces
if (!username.trim()) {
    errorMessages.push("Username is required.");
}

if (!email.trim()) {
    errorMessages.push("Email is required.");
}

if (!phone.trim()) {
    errorMessages.push("Phone number is required.");
} else {
    // Check if phone number is numeric and has 10 digits
    if (!/^d{10}$/.test(phone)) {
        errorMessages.push("Phone number must be 10 digits numeric.");
    }
}

// Check password length and requirements
if (password.length < 7) {
    errorMessages.push("Password must be at least 7 characters.");
} else {
    // Check if password contains at least one uppercase letter, one digit, and one
    special character
    if (!/[A-Z]/.test(password) || !/d/.test(password) || !/[&$#@]/.test(password)) {
        errorMessages.push("Password must contain at least one uppercase letter, one
        digit, and one special character (&,$#@).");
    }
}
```

```
// Check if password and confirm password match
if (password !== confirmPassword) {
  errorMessages.push("Password and Confirm Password do not match.");
}

// Check email format using a regular expression
if (!/^[A-Za-z0-9._%+-]+@[A-Za-z0-9.-]+\.[A-Za-z]{2,3}$/i.test(email)) {
  errorMessages.push("Invalid email format.");
}

// Display error messages if any
if (errorMessages.length > 0) {
  errorMessagesDiv.innerHTML = errorMessages.join("<br>");
}
});
});
</script>
```

Output:

### Student Registration

Username:

Devanshu2003

Email:

devanshusurana2003@gm

Phone Number:

123456789

Password:

\*\*\*\*\*

Confirm Password:

\*\*\*\*\*

Register

Phone number must be 10 digits numeric.  
Password must contain at least one uppercase letter, one  
digit, and one special character (&,\$,#,@).  
Password and Confirm Password do not match.

Output for 2nd Problem Statement:



# DOM Manipulation

Text changed with jQuery!

Change Text

Change Color

Change Position



Change Image

This is a parent node.

Add Text Node

Delete Node

Enter Text:

Submit

## DOM Manipulation

This is a sample text.



Change Text

Change Color

Change Position

Change Image

This is a parent node.

Add Text Node

Delete Node

Enter Text:

Submit