Experiment 9 : To study AJAX

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Aim: To study AJAX

Theory:-

1. How do Synchronous and Asynchronous Requests differ?

Synchronous and Asynchronous requests are two different methods used in web development to communicate with a server, especially when using technologies like **AJAX (Asynchronous JavaScript and XML)**.

Synchronous Requests:

- In a synchronous request, the browser waits for the server to respond before continuing to execute the rest of the JavaScript code.
- The entire user interface (UI) **freezes or becomes unresponsive** until the request is complete.
- This approach can lead to a **poor user experience**, especially if the server takes a long time to respond.

Example:

If a synchronous request is made to load data from a server, the user cannot interact with the webpage (like clicking buttons or typing) until the response is received.

Asynchronous Requests:

- In an asynchronous request, the browser does not wait for the response.
- The remaining JavaScript code continues to execute, and the browser stays responsive.
- Once the server responds, a **callback function** (or event listener) is triggered to handle the response.

Example:

Fetching live search results without reloading the page. The user continues typing while results update in real time.

Key Differences:

Feature	Synchronous	Asynchronous
Browser Behavior	Waits for response	Does not wait
User Experience	Freezes UI	UI remains responsive
Implementation	Simpler, but less efficient	Requires callbacks or promises
Usage	Rare in modern web apps	Common and preferred

2. Describe various properties and methods used in XMLHttpRequest Object

The XMLHttpRequest object is a built-in JavaScript object used to interact with servers and fetch data without reloading the webpage. It is a core part of AJAX-based applications.

Commonly Used Properties:

Property	Description
readyStat e	Returns the current state of the request (0 to 4).
status	Returns the HTTP status code (e.g., 200 for OK, 404 for Not Found).
statusTex t	Returns the textual status (e.g., "OK", "Not Found").
responseT ext	Returns the response data as a string.
responseX ML	Returns the response data as an XML document (if the response is XML).

readyState Values:

Value	State	Description
0	UNSENT	Request not initialized
1	OPENED	open() has been called
2	HEADERS_RECEIVED	send() has been called
3	LOADING	Receiving the response
4	DONE	Request finished and response is ready

Commonly Used Methods:

Method

Description

```
open(method, url, Initializes a request. method is "GET" or "POST", async) async is a boolean.

send() Sends the request to the server.

setRequestHeader(head er, value) Sets a request header (e.g., Content-Type). Used after open(), before send().

Cancels an ongoing request.
```

Example:

Javascript

```
let xhr = new XMLHttpRequest();
xhr.open("GET", "data.json", true); // Asynchronous GET request
xhr.onreadystatechange = function() {
   if (xhr.readyState === 4 && xhr.status === 200) {
      console.log(xhr.responseText); // Handle response
   }
};
xhr.send();
```

Problem Statement:

Create a registration page having fields like Name, College, Username and Password (read password twice).

Validate the form by checking for

- 1. Usernameis not same as existing entries
- 2. Name field is not empty
- 3. Retyped password is matching with the earlier one. Prompt a message is And also auto suggest college names.

Show the message "Successfully Registered" on the same page below the submit button, on Successfully registration. Let all the updations on the page be Asynchronously loaded. Implement the same using XMLHttpRequest Object.

CODE:-

abc.html

```
<!DOCTYPE html>
<html lang="en">
<head>
 <meta <pre>charset="UTF-8">
 <title>Registration Page</title>
 <style>
   body {
      font-family: 'Segoe UI', sans-serif;
     background: #e3f2fd;
     margin: 0;
     background: white;
     max-width: 500px;
     margin: 40px auto;
     padding: 30px;
     border-radius: 10px;
     box-shadow: 0 8px 16px rgba(0,0,0,0.2);
   h2 {
      text-align: center;
      color: #0d47a1;
```

```
label {
 display: block;
 margin-top: 15px;
 font-weight: bold;
input[type="text"],
input[type="password"],
input[list] {
 width: 100%;
 margin-top: 6px;
 border: 1px solid #ccc;
 border-radius: 5px;
 box-sizing: border-box;
button {
 margin-top: 20px;
 padding: 12px;
 background-color: #1976d2;
 color: white;
 border: none;
 font-size: 16px;
 cursor: pointer;
button:hover {
 background-color: #1565c0;
 margin-top: 20px;
 color: #d32f2f;
```

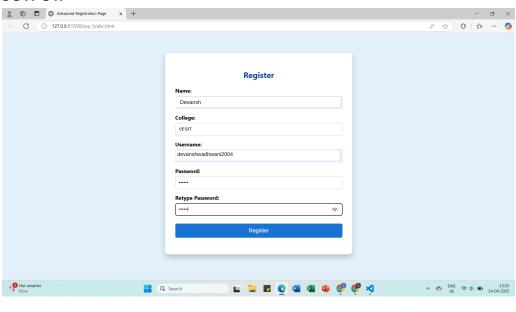
```
color: #388e3c;
     font-size: 13px;
     color: #d32f2f;
     margin-top: 3px;
 </style>
</head>
<body>
<div class="container">
 <h2>Register</h2>
 <form id="regForm" onsubmit="return false;">
   <label for="name">Name:</label>
   <input type="text" id="name">
   <div class="input-feedback" id="nameFeedback"></div>
   <label for="college">College:</label>
   <input list="colleges" id="college">
   <datalist id="colleges">
     <option value="VESIT">
     <option value="IIT Bombay">
     <option value="Stanford University">
     <option value="MIT">
     <option value="BITS Pilani">
     <option value="University of Mumbai">
     <option value="Harvard University">
   </datalist>
   <label for="username">Username:</label>
   <input type="text" id="username" onblur="checkUsernameAsync()">
   <div class="input-feedback" id="usernameFeedback"></div>
   <label for="password">Password:</label>
    <input type="password" id="password">
```

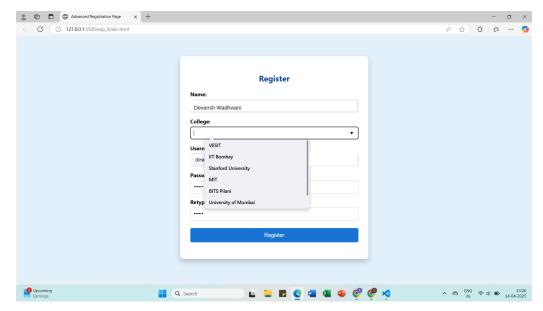
```
<label for="confirmPassword">Retype Password:</label>
   <input type="password" id="confirmPassword">
   <div class="input-feedback" id="passwordFeedback"></div>
   <button type="button" onclick="submitForm()">Register</button>
 </form>
 <div class="message" id="resultMessage"></div>
</div>
<script>
   const existingUsernames = ["sanket123", "john doe", "admin", "guest"];
   function checkUsernameAvailable(username) {
     return new Promise((resolve) => {
       const taken = existingUsernames.includes(username.trim());
       const result = {
         available: !taken,
         message: taken ? "Username already exists." : "Username is
available."
     const name = document.getElementById("name").value.trim();
     const college = document.getElementById("college").value.trim();
     const username = document.getElementById("username").value.trim();
     const password = document.getElementById("password").value;
     const confirmPassword =
document.getElementById("confirmPassword").value;
     const nameFeedback = document.getElementById("nameFeedback");
     const usernameFeedback = document.getElementById("usernameFeedback");
     const passwordFeedback = document.getElementById("passwordFeedback");
      const resultMessage = document.getElementById("resultMessage");
```

```
nameFeedback.textContent = "";
     usernameFeedback.textContent = "";
     passwordFeedback.textContent = "";
     resultMessage.textContent = "";
     resultMessage.classList.remove("success");
     let valid = true;
     if (name === "") {
       nameFeedback.textContent = "Name cannot be empty.";
       valid = false;
     if (password !== confirmPassword) {
       passwordFeedback.textContent = "Passwords do not match.";
       valid = false;
     const usernameCheck = await checkUsernameAvailable(username);
     usernameFeedback.textContent = usernameCheck.message;
     usernameFeedback.style.color = usernameCheck.available ? "green" :
"#d32f2f";
     if (!usernameCheck.available) {
       valid = false;
     if (!valid) return;
     setTimeout(() => {
       resultMessage.textContent = "Successfully Registered";
       resultMessage.classList.add("success");
     }, 1000);
   document.getElementById("username").addEventListener("input", () => {
     document.getElementById("usernameFeedback").textContent = "";
```

```
});
</script>
</body>
</html>
```

OUTPUT:-

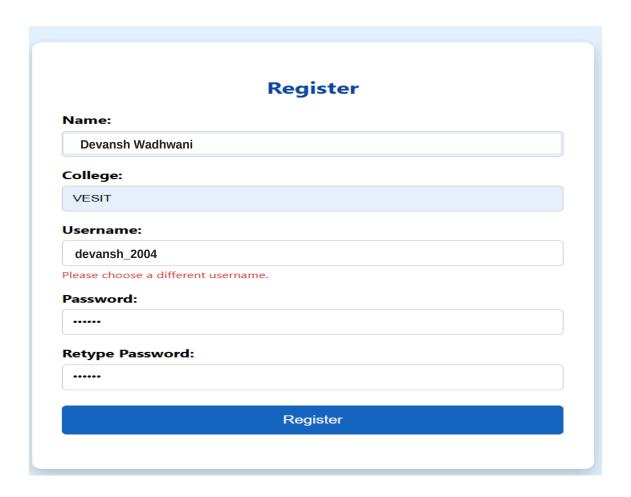




Username:

devansh_2004

Please choose a different username.



Username:

devansh3108

Username already exists.

	Register
Name:	
Devansh Wadhwani	
College:	
VESIT	
Username:	
devanshwadhwani2004	
Username is available.	
Password:	
•••	
Retype Password:	
Passwords do not match.	
	Register

Register		
Name:		
Name cannot be empty.		
College:		
VESIT		
Username:		
devanshwadhwani2004		
Username is available.		
Password:		
•••		
Retype Password:		
•••		
Passwords do not match.		
	Register	

Register		
Name:		
Devansh Wadhwani		
College:		
VESIT		
Username:		
devanshwadhwani2004		
Username is available.		
Password:		
•••		
Retype Password:		
•••		
	Register	