AJAX - Assignment

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1: What is AJAX

AJAX stands for Asynchronous JavaScript and XML. AJAX is not a programming language or a tool, but a concept. It is a set of web development techniques that enable the asynchronous exchange of data between the client and server. It allows web pages to update dynamically without requiring a full page reload.

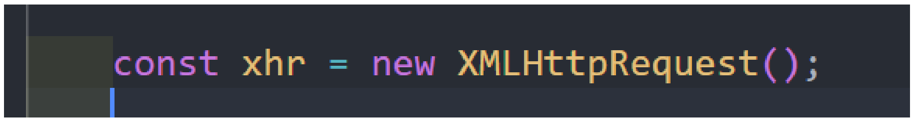
2: How does it work?

User Interaction:

An event, such as a button click or form submission, triggers a JavaScript function.

AJAX Request Initialization:

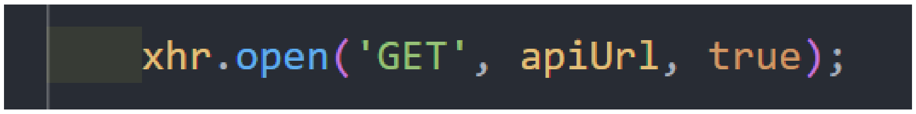
Inside the JavaScript function, an XMLHttpRequest object is created. Modern approaches may also use the Fetch API.



```
const xhr = new XMLHttpRequest();
```

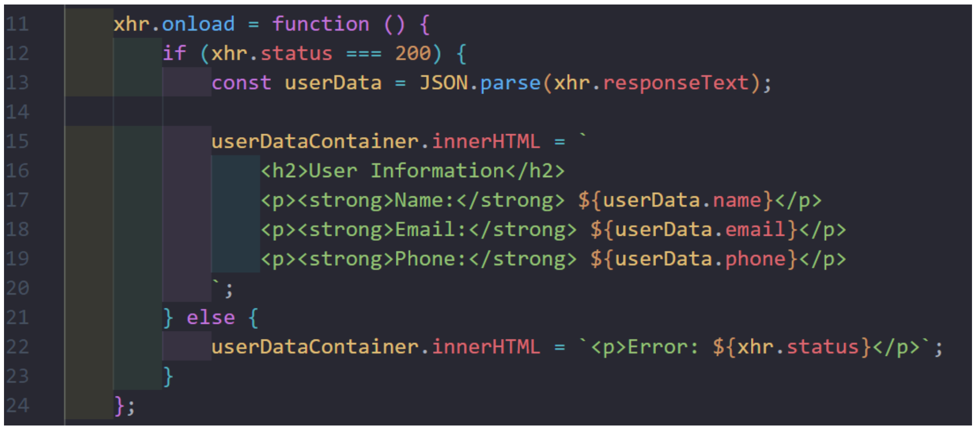
Request Configuration:

The XMLHttpRequest object is configured with the details of the request, including the HTTP method (GET, POST, etc.), the target URL, and whether the request is asynchronous.



```
xhr.open('GET', apiUrl, true);
```

Event Handling:

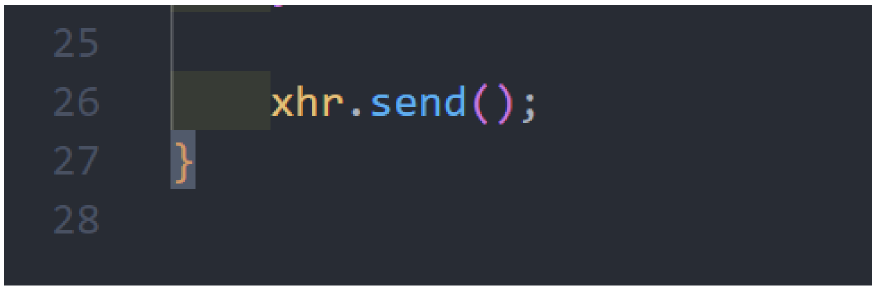


```
xhr.onload = function () {
    if (xhr.status === 200) {
        const userData = JSON.parse(xhr.responseText);

        userDataContainer.innerHTML = `
            <h2>User Information</h2>
            <p><strong>Name:</strong> ${userData.name}</p>
            <p><strong>Email:</strong> ${userData.email}</p>
            <p><strong>Phone:</strong> ${userData.phone}</p>
        `;
    } else {
        userDataContainer.innerHTML = `<p>Error: ${xhr.status}</p>`;
    }
};
```

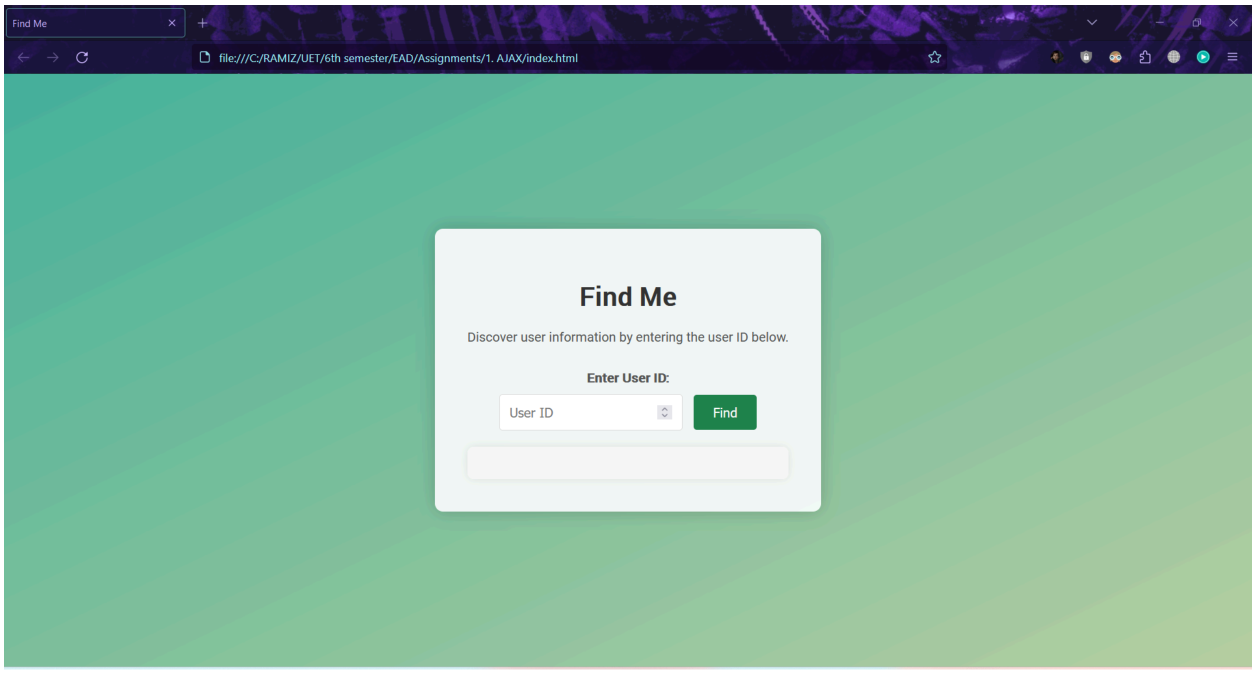
Send the Request:

The XMLHttpRequest object sends the request to the server.



```
    xhr.send();
}
```

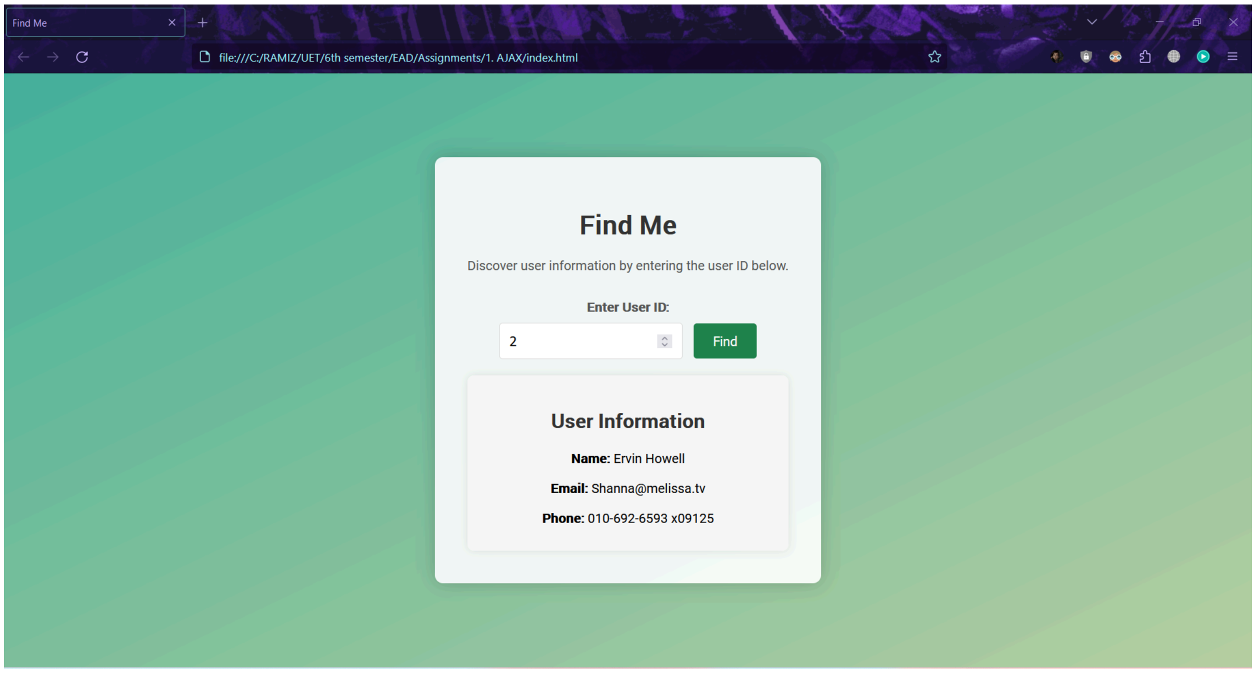
3: Practical


Find Me
file:///C:/RAMIZ/UET/6th semester/EAD/Assignments/1. AJAX/index.html

Find Me

Discover user information by entering the user ID below.

Enter User ID:


Find Me
file:///C:/RAMIZ/UET/6th semester/EAD/Assignments/1. AJAX/index.html

Find Me

Discover user information by entering the user ID below.

Enter User ID:

2

User Information

Name: Ervin Howell

Email: Shanna@melissa.tv

Phone: 010-692-6593 x09125

4: XMLHttpRequest & AJAX with JSON:

XHR lets JavaScript chat with servers. AJAX & JSON used XML, now loves JSON for simplicity. In my example, an XMLHttpRequest object is created to fetch user data from a public API (JSONPlaceholder) based on the user ID entered by the user.

5: Common Challenges and Solutions:

1. **Security Woes:**
    - **Prob:** XSS attacks.
    - **Fix:** Validate input, encode output, HTTPS vibes.
2. **SEO Struggles:**
    - **Prob:** Google gets confused.
    - **Fix:** Mix server/client rendering, use metadata, and handle URLs like a pro.
3. **Browser Brawls:**
    - **Prob:** Browser rivalry.
    - **Fix:** jQuery or fetch API, test on every browser in the game.
4. **Concurrency Chaos:**
    - **Prob:** Race conditions.
    - **Fix:** Synchronize with promises or async/await.

6: Best Practices

1. SEO Optimization
2. Asynchronous Design Patterns
3. Data Validation
4. Using server-side logging and monitoring tools