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AJAX

AJAX Introduction

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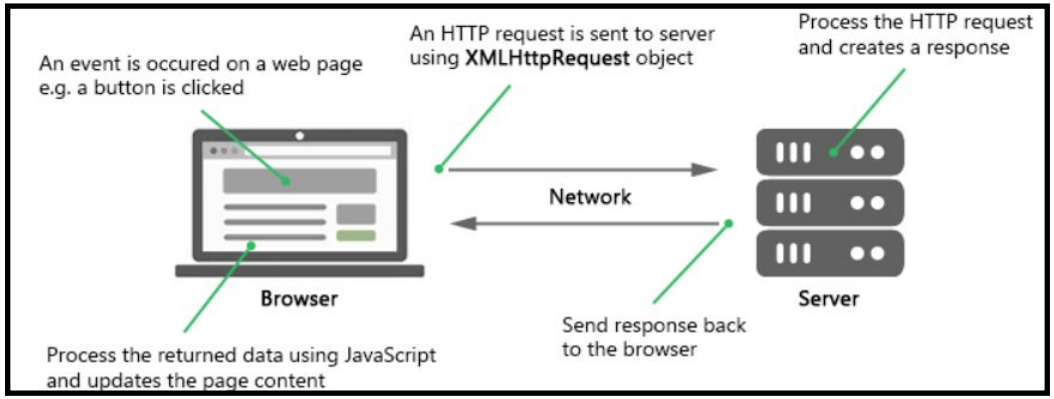
- AJAX stands for **A**synchronous JavaScript **A**nd **X**ML.
- It is a combination of **XMLHttpRequest**, **JavaScript** and **HTML DOM**.
- The web pages are updated **asynchronously** by **exchanging data** with the **web server**.
- Instead of **reloading** the whole web page, **AJAX** helps in updating **parts of a web page**.



XMLHttp Request

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- To request data from a server, **XMLHttpRequest object** is used.
- **Open()** and **send()** methods of XMLHttpRequest object are used to **send a request** to the server.

```
xhttp.open("GET", "ajax_info.txt", true)
xhttp.send();
```

Method	Description
open (method, url, async)	Specifies the type of request method - GET or POST url - file location async - true (asynchronous) or false (synchronous)
send()	Sends request to the server(GET)
send (string)	Sends request to the server (POST)

- **url** - A file on a server
  The file can be of any kind like **.txt, .xml** or **server scripting files like .asp and .php**.

```
xhttp.open("GET", "ajax_test.asp", true);
```

Asynchronous - True or False?

- **Asynchronous** parameter of open is set to **true**.
- JavaScript **does not wait** for server **response**, instead
  - Start **executing other scripts** while waiting.
  - After the **response is ready,** deal with the responses.
- The **default** value of async parameter is **true**.
- **async = false** is **not recommended**.

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GET or POST

- **GET** is used in **most cases,, and** it is **simpler** and **faster** than POST.
- **POST** is **more secure** and **robust** than **GET**.
- **POST** is used in the following situations
  - When **sending large amount of data** to the server.
  - When a **cached file** is **not an option**.
  - When sending **user input**.

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GET Requests

- A simple GET request.

```
xhttp.open("GET", "demo_get.asp");
xhttp.send();
```

- To **avoid** getting **cached result**, add **a unique ID** to the URL.

```
xhttp.open("GET", "demo_get.asp?t=" + Math.random());
xhttp.send();
```

- To **send information** with the GET method, **add the information to the URL**.

```
xhttp.open("GET", "demo_get2.asp?fname=Henry&lname=Ford");
xhttp.send();
```

POST Requests

- A simple POST request.

```
xhttp.open("POST", "demo_post.asp");
xhttp.send();
```

- The Data like HTML form are requested by adding an HTTP header with **setRequestHeader().**

- The data want to be sent is specified in the send() method.

```
xhttp.open("POST", "ajax_test.asp");
xhttp.setRequestHeader("Content-type", "application/x-www-form-urlencoded");
xhttp.send("fname=Henry&lname=Ford");
```

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Method	Description
setRequestHeader(header, value)	Adds HTTP headers to the request header: specifies the header name value: specifies the header value

Synchronous Request

- **Synchronous request** is achieved by setting the **async** parameter to **false**.
- For quick testing, async = false is set.
- onreadystatechange function is not needed as the server waits for server completion.

```
xhttp.open("GET", "ajax_info.txt", false);
xhttp.send();
document.getElementById("demo").innerHTML = xhttp.responseText;
```

XMLHttp Response

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Server Response Properties

Properties	Description
responseText	Get the response data as a string
responseXML	Get the response data as an XML data

The responseText Property

The **responseText** property returns the **server response** as a **JavaScript string.**

```
document.getElementById("demo").innerHTML = xhttp.responseText;
```

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The responseXML Property

- An in-built **XML parser** is there in **XMLHttpRequest object**.
- The **responseXML** property returns the **server response** as an **XML DOM object**.

```
const xmlDoc = xhttp.responseXML;
const x = xmlDoc.getElementsByTagName("ARTIST");

let txt = "";
for (let i = 0; i < x.length; i++) {
  txt += x[i].childNodes[0].nodeValue + "<br>";
}
document.getElementById("demo").innerHTML = txt;

xhttp.open("GET", "cd_catalog.xml");
xhttp.send();
```

XMLHttp Response

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Server Response Methods

Method	Description
getResponseHeader()	Returns specific header information from the server resource
getAllResponseHeaders()	Returns all the header information from the server resource

The getAllResponseHeaders() Method

All the **header information** from the server response is returned by the **getAllResponseHeaders().**

```
const xhttp = new XMLHttpRequest();
xhttp.onload = function() {
    document.getElementById("demo").innerHTML =
    this.getAllResponseHeaders();
}
xhttp.open("GET", "ajax_info.txt");
xhttp.send();
```

The getResponseHeader() Method

The **specific header information** from the server response is returned by **getResponseHeader() method**.

```
const xhttp = new XMLHttpRequest();
xhttp.onload = function() {
    document.getElementById("demo").innerHTML =
    this.getResponseHeader("Last-Modified");
}
xhttp.open("GET", "ajax_info.txt");
xhttp.send();
```

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Display XML data in an HTML Table

The values of <ARTIST> and <TITLE> elements are displayed in an HTML table.

```
<table id="demo"></table>

<script>
function loadXMLDoc() {
  const xhttp = new XMLHttpRequest();
  xhttp.onload = function() {
    const xmlDoc = xhttp.responseXML;
    const cd = xmlDoc.getElementsByTagName("CD");
    myFunction(cd);
  }
  xhttp.open("GET", "cd_catalog.xml");
  xhttp.send();
}

function myFunction(cd) {
  let table="<tr><th>Artist</th><th>Title</th></tr>";
  for (let i = 0; i < cd.length; i++) {
    table += "<tr><td>" +
    cd[i].getElementsByTagName("ARTIST")[0].childNodes[0].nodeValue +
    "</td><td>" +
    cd[i].getElementsByTagName("TITLE")[0].childNodes[0].nodeValue +
    "</td></tr>";
  }
  document.getElementById("demo").innerHTML = table;
}
</script>

</body>
</html>
```

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Display the first CD element in an HTML div

```
const xhttp = new XMLHttpRequest();
xhttp.onload = function() {
  const xmlDoc = xhttp.responseXML;
  const cd = xmlDoc.getElementsByTagName("CD");
  myFunction(cd, 0);
}
xhttp.open("GET", "cd_catalog.xml");
xhttp.send();

function myFunction(cd, i) {
  document.getElementById("showCD").innerHTML =
  "Artist: " +
  cd[i].getElementsByTagName("ARTIST")[0].childNodes[0].nodeValue +
  "<br>Title: " +
  cd[i].getElementsByTagName("TITLE")[0].childNodes[0].nodeValue +
  "<br>Year: " +
  cd[i].getElementsByTagName("YEAR")[0].childNodes[0].nodeValue;
}
```

Navigate between CDs

To navigate between CDs, create next() and previous() functions.

```
function next() {
  // display the next CD, unless you are on the last CD
  if (i < len-1) {
    i++;
    displayCD(i);
  }
}

function previous() {
  // display the previous CD, unless you are on the first CD
  if (i > 0) {
    i--;
    displayCD(i);
  }
}
```

Show Album information when clicking on a CD

To show album information when clicking on a CD, call displayCD() function on the onclick event.

```
function displayCD(i) {
  document.getElementById("showCD").innerHTML =
  "Artist: " +
  cd[i].getElementsByTagName("ARTIST")[0].childNodes[0].nodeValue +
  "<br>Title: " +
  cd[i].getElementsByTagName("TITLE")[0].childNodes[0].nodeValue +
  "<br>Year: " +
  cd[i].getElementsByTagName("YEAR")[0].childNodes[0].nodeValue;
}
```

fetch()

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- The **fetch()** method in JavaScript **sends request to the server** and the fetched **information is being loaded** in the webpages.

Syntax

```
fetch( url, options )
```

url - url to which the request is to be made.

options - It is an **optional parameter**. It is an array of properties.

Returns value - The return data is of **JSON** or **XML format**.

It can be a single object or array of objects.

fetch()

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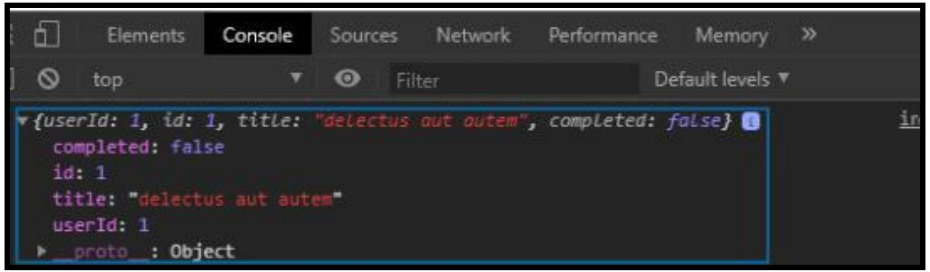
- fetch() method without options will act as a get request.

```
    <script>
        // API for get requests
        let fetchRes = fetch(
"https://jsonplaceholder.typicode.com/todos/1");
        // fetchRes is the promise to resolve
        // it by using.then() method
        fetchRes.then(res =>
            res.json()).then(d => {
                console.log(d)
            })
    </script>
```

Output



fetch()

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- fetch() method with options given below will act as a post request.

```
    <script>
        user = {"name": "Geeks for Geeks",
            "age": "23"}
// Options to be given as parameter in fetch for making requests
other then GET
        let options = {
            method: 'POST',
            headers: {
                'Content-Type':'application/json;charset=utf-8'},
            body: JSON.stringify(user)}
        // Fake api for making post requests
        let fetchRes = fetch(
"http://dummy.restapiexample.com/api/v1/create",options);
        fetchRes.then(res =>
            res.json()).then(d => {console.log(d)})
    </script>
```

Output