AJAX INTRODUCTION

AJAX is a developer's dream, because you can:

- Read data from a web server - after the page has loaded
- Update a web page without reloading the page
- Send data to a web server - in the background

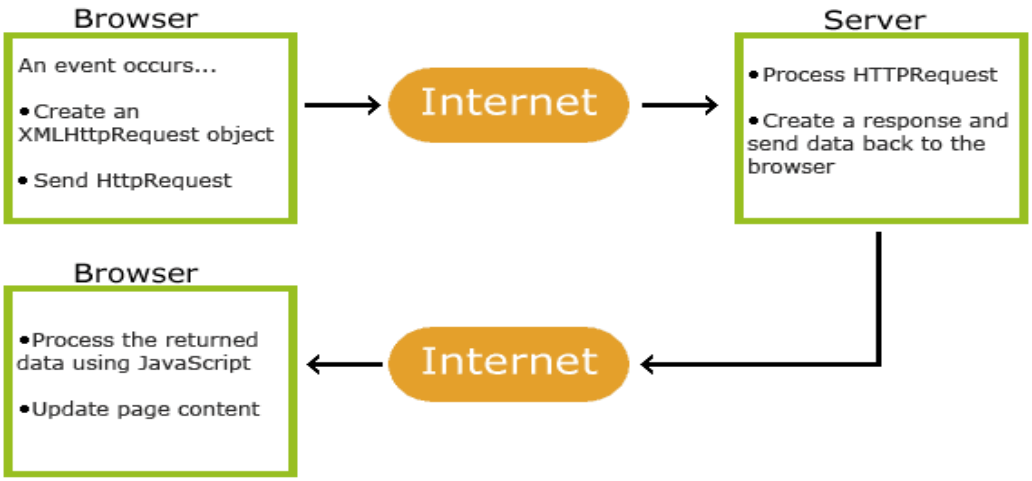
What is AJAX?

AJAX = **A**synchronous **J**avaScript **and** **X**ML.
AJAX is not a programming language.
AJAX just uses a combination of:

- A browser built-in XMLHttpRequest object (to request data from a web server)
- JavaScript and HTML DOM (to display or use the data)

AJAX is a misleading name. AJAX applications might use XML to transport data, but it is equally common to transport data as plain text or JSON text.
AJAX allows web pages to be updated asynchronously by exchanging data with a web server behind the scenes. This means that it is possible to update parts of a web page, without reloading the whole page.

How AJAX Works / AJAX architecture / AJAX Application Model



1. An event occurs in a web page (the page is loaded, a button is clicked)
2. An XMLHttpRequest object is created by JavaScript
3. The XMLHttpRequest object sends a request to a web server
4. The server processes the request
5. The server sends a response back to the web page
6. The response is read by JavaScript
7. Proper action (like page update) is performed by JavaScript

AJAX - The XMLHttpRequest Object

The XMLHttpRequest Object

All modern browsers support the XMLHttpRequest object.
The XMLHttpRequest object can be used to exchange data with a web server behind the scenes.
This means that it is possible to update parts of a web page, without reloading the whole page.

Create an XMLHttpRequest Object
Syntax for creating an XMLHttpRequest object:

variable = new XMLHttpRequest();

XMLHttpRequest Object Methods

Method	Description
new XMLHttpRequest()	Creates a new XMLHttpRequest object
abort()	Cancels the current request
getAllResponseHeaders()	Returns header information
getResponseHeader()	Returns specific header information
open(*method*, *url*, *async*, *user*, *psw*)	Specifies the request *method*: the request type GET or POST *url*: the file location *async*: true (asynchronous) or false (synchronous) *user*: optional user name *psw*: optional password
send()	Sends the request to the server Used for GET requests
send(*string*)	Sends the request to the server. Used for POST requests
setRequestHeader()	Adds a label/value pair to the header to be sent

XMLHttpRequest Object Properties

Property	Description
onreadystatechange	Defines a function to be called when the readyState property changes

readyState	Holds the status of the XMLHttpRequest. 0: request not initialized 1: server connection established 2: request received 3: processing request 4: request finished and response is ready
responseText	Returns the response data as a string
responseXML	Returns the response data as XML data
status	Returns the status-number of a request 200: "OK" 403: "Forbidden" 404: "Not Found"
statusText	Returns the status-text (e.g. "OK" or "Not Found")

AJAX - Send a Request to a Server

Send a Request to a Server

To send a request to a server, we use the open() and send() methods of the XMLHttpRequest object:

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

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

GET or POST?

GET is simpler and faster than POST, and can be used in most cases.
However, always use POST requests when:

- A cached file is not an option (update a file or database on the server).
- Sending a large amount of data to the server (POST has no size limitations).
- Sending user input (which can contain unknown characters), POST is more robust and secure than GET.

Asynchronous - True or False?

Server requests should be sent asynchronously.
The async parameter of the open() method should be set to true:

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

By sending asynchronously, the JavaScript does not have to wait for the server response, but can instead:

- execute other scripts while waiting for server response
- deal with the response after the response is ready

The onreadystatechange Property

With the XMLHttpRequest object you can define a function to be executed when the request receives an answer.
The function is defined in the **onreadystatechange** property of the XMLHttpResponse object:

AJAX - Server Response

The onreadystatechange Property

The **readyState** property holds the status of the XMLHttpRequest.
The **onreadystatechange** property defines a function to be executed when the readyState changes.
The **status** property and the **statusText** property holds the status of the XMLHttpRequest object.

Property	Description
onreadystatechange	Defines a function to be called when the readyState property changes
readyState	Holds the status of the XMLHttpRequest. 0: request not initialized 1: server connection established 2: request received 3: processing request 4: request finished and response is ready
status	200: "OK" 403: "Forbidden" 404: "Page not found"

	For a complete list go to the Http Messages Reference
statusText	Returns the status-text (e.g. "OK" or "Not Found")

The onreadystatechange function is called every time the readyState changes.
When readyState is 4 and status is 200, the response is ready:

AJAX Simple Program

Writa an AJAX program to change the content of text.

```
<!DOCTYPE html>
<html>
<body>

<div id="demo">
<h2>The XMLHttpRequest Object</h2>
<button type="button" onclick="loadDoc()">Change Content</button>
</div>

<script>
function loadDoc() {
  var xhttp = new XMLHttpRequest();
  xhttp.onreadystatechange = function() {
    if (this.readyState == 4 && this.status == 200) {
      document.getElementById("demo").innerHTML =
      this.responseText;
    }
  };
  xhttp.open("GET", "ajax_info.txt", true);
  xhttp.send();
}
</script>

</body>
</html>
```

Output

The XMLHttpRequest Object
Change Content

ajax_info.txt

AJAX is not a programming language.
AJAX is a technique for accessing web servers from a web page.
AJAX stands for Asynchronous JavaScript And XML.