AJAX 程式設計
AJAX PROGRAMMING DESIGN

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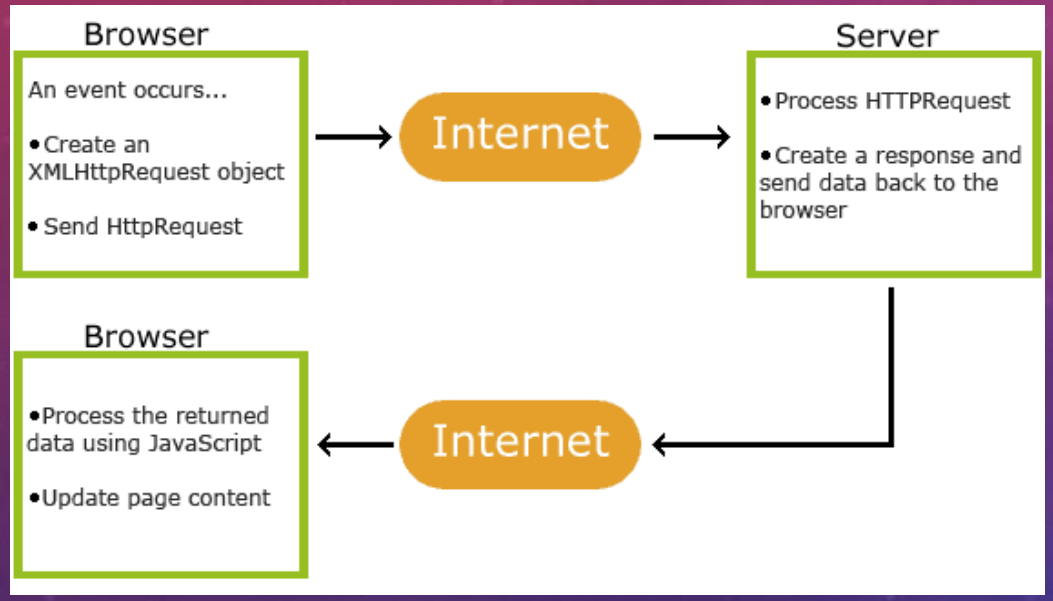
AJAX PROGRAMMING

WHAT IS AJAX?

- Asynchronous JavaScript And XML (AJAX)
  1. A browser built-in XMLHttpRequest object (to request data from a web server)
  2. JavaScript and HTML DOM (to display or use the data)

- 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



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

BASIC EXAMPLE
LOAD DATA FROM LOCAL SITE

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

<h2>The XMLHttpRequest Object</h2>

<p id="demo">Let AJAX change this text.</p>

<button type="button" onclick="loadDoc()">Change Content</button>

<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>
```

var xhttp = new *XMLHttpRequest*();

xhttp.onreadystatechange

this.readyState == 4

this.status == 200

xhttp.open(*method, url, async*)

xhttp.send(*string*)

ONREADYSTATECHANGE 的三個重要屬性

属性	描述
onreadystatechange	存储函数（或函数名），每当 readyState 属性改变时，就会调用该函数。
readyState	存有 XMLHttpRequest 的状态。从 0 到 4 发生变化。 • 0: 请求未初始化 • 1: 服务器连接已建立 • 2: 请求已接收 • 3: 请求处理中 • 4: 请求已完成，且响应已就绪
status	200: "OK" 404: 未找到页面

GET OR POST

- 與POST相比，GET更簡單也更快，並且在大部分情況下都能用。

- 然而，在以下情況中，請使用POST請求：
  1. 無法使用緩存文件（更新服務器上的文件或數據庫）
  2. 向服務器發送大量數據（POST沒有數據量限制）
  3. 發送包含未知字符的用戶輸入時，POST比GET更穩定也更可靠

異步與同步

- Async 是接收到需求，不用一直等到需求完成再執行其他需求。
- Async 與 Sync 的差別在於：發送需求的人是否需要等到需求完成才可以執行其他事情。

服務器響應

属性	描述
responseText	获得字符串形式的响应数据。
responseXML	获得 XML 形式的响应数据。

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

服務器響應 XML

https://www.w3schools.com/js/cd_catalog.xml

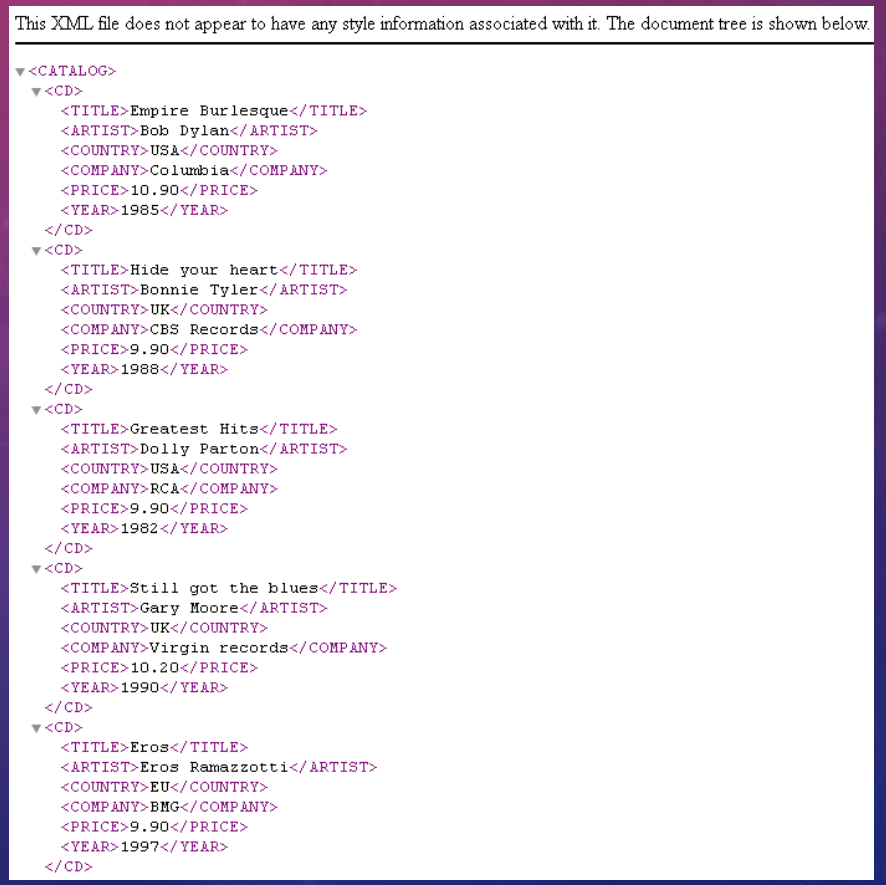
```
<!DOCTYPE html>
<html>
<body>

<h2>The XMLHttpRequest Object</h2>

<p id="demo"></p>

<script>
var xhttp, xmlDoc, txt, x, i;
xhttp = new XMLHttpRequest();
xhttp.onreadystatechange = function() {
if (this.readyState == 4 && this.status == 200) {
  xmlDoc = this.responseXML;
  txt = "";
  x = xmlDoc.getElementsByTagName("ARTIST");
  for (i = 0; i < x.length; i++) {
    txt = txt + x[i].childNodes[0].nodeValue + "<br>";
  }
  document.getElementById("demo").innerHTML = txt;
  }
};
xhttp.open("GET", "cd_catalog.xml", true);
xhttp.send();
</script>

</body>
</html>
```


This XML file does not appear to have any style information associated with it. The document tree is shown below.
<CATALOG>
<CD>
<TITLE>Empire Burlesque</TITLE>
<ARTIST>Bob Dylan</ARTIST>
<COUNTRY>USA</COUNTRY>
<COMPANY>Columbia</COMPANY>
<PRICE>10.90</PRICE>
<YEAR>1985</YEAR>
</CD>
<CD>
<TITLE>Hide your heart</TITLE>
<ARTIST>Bonnie Tyler</ARTIST>
<COUNTRY>UK</COUNTRY>
<COMPANY>CBS Records</COMPANY>
<PRICE>9.90</PRICE>
<YEAR>1988</YEAR>
</CD>
<CD>
<TITLE>Greatest Hits</TITLE>
<ARTIST>Dolly Parton</ARTIST>
<COUNTRY>USA</COUNTRY>
<COMPANY>RCA</COMPANY>
<PRICE>9.90</PRICE>
<YEAR>1982</YEAR>
</CD>
<CD>
<TITLE>Still got the blues</TITLE>
<ARTIST>Gary Moore</ARTIST>
<COUNTRY>UK</COUNTRY>
<COMPANY>Virgin records</COMPANY>
<PRICE>10.20</PRICE>
<YEAR>1990</YEAR>
</CD>
<CD>
<TITLE>Eros</TITLE>
<ARTIST>Eros Ramazzotti</ARTIST>
<COUNTRY>EU</COUNTRY>
<COMPANY>BMG</COMPANY>
<PRICE>9.90</PRICE>
<YEAR>1997</YEAR>
</CD>
</CATALOG>
```
```

服務器響應 FROM PHP

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

<h2>The XMLHttpRequest Object</h2>

<h3>Start typing a name in the input field below:</h3>

<p>Suggestions: <span id="txtHint"></span></p>

<p>First name: <input type="text" id="txt1" onkeyup="showHint(this.value)"></p>

<script>
function showHint(str) {
  var xhttp;
  if (str.length == 0) {
    document.getElementById("txtHint").innerHTML = "";
    return;
  }
  xhttp = new XMLHttpRequest();
  xhttp.onreadystatechange = function() {
    if (this.readyState == 4 && this.status == 200) {
      document.getElementById("txtHint").innerHTML = this.responseText;
    }
  };
  xhttp.open("GET", "gethint.php?q="+str, true);
  xhttp.send();
}
</script>

</body>
</html>
```

```php
<?php
// Array with names
$a[] = "Anna";
$a[] = "Brittany";
$a[] = "Cinderella";
$a[] = "Diana";
$a[] = "Eva";
$a[] = "Fiona";
$a[] = "Gunda";
$a[] = "Hege";
$a[] = "Inga";
$a[] = "Johanna";
$a[] = "Kitty";
$a[] = "Linda";
$a[] = "Nina";
$a[] = "Ophelia";
$a[] = "Petunia";
$a[] = "Amanda";
$a[] = "Raquel";
$a[] = "Cindy";
$a[] = "Doris";
$a[] = "Eve";
$a[] = "Evita";
$a[] = "Sunniva";
$a[] = "Tove";
$a[] = "Unni";
$a[] = "Violet";
$a[] = "Liza";
$a[] = "Elizabeth";
$a[] = "Ellen";
$a[] = "Wenche";
$a[] = "Vicky";
```

```php
// get the q parameter from URL
$q = $_REQUEST["q"];

$hint = "";

// lookup all hints from array if $q is different from ""
if ($q !== "") {
    $q = strtolower($q);
    $len=strlen($q);
    foreach($a as $name) {
        if (stristr($q, substr($name, 0, $len))) {
            if ($hint === "") {
                $hint = $name;
            } else {
                $hint .= ", $name";
            }
        }
    }
}

// Output "no suggestion" if no hint was found or output correct values
echo $hint === "" ? "no suggestion" : $hint;
?>
```

THANK YOU

自學資源