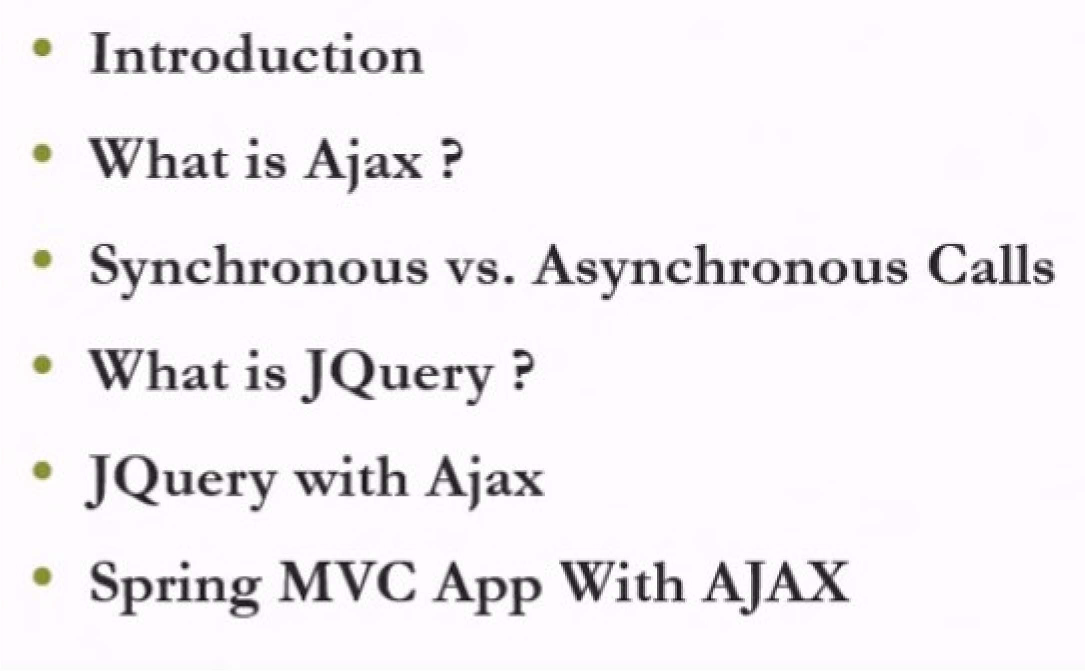
Ajax and JQuery

Rajeev Gupta
Rgupta.mtech@gmail.com
Java Trainer & Consultant

Agenda



- Introduction
- What is Ajax ?
- Synchronous vs. Asynchronous Calls
- What is JQuery ?
- JQuery with Ajax
- Spring MVC App With AJAX

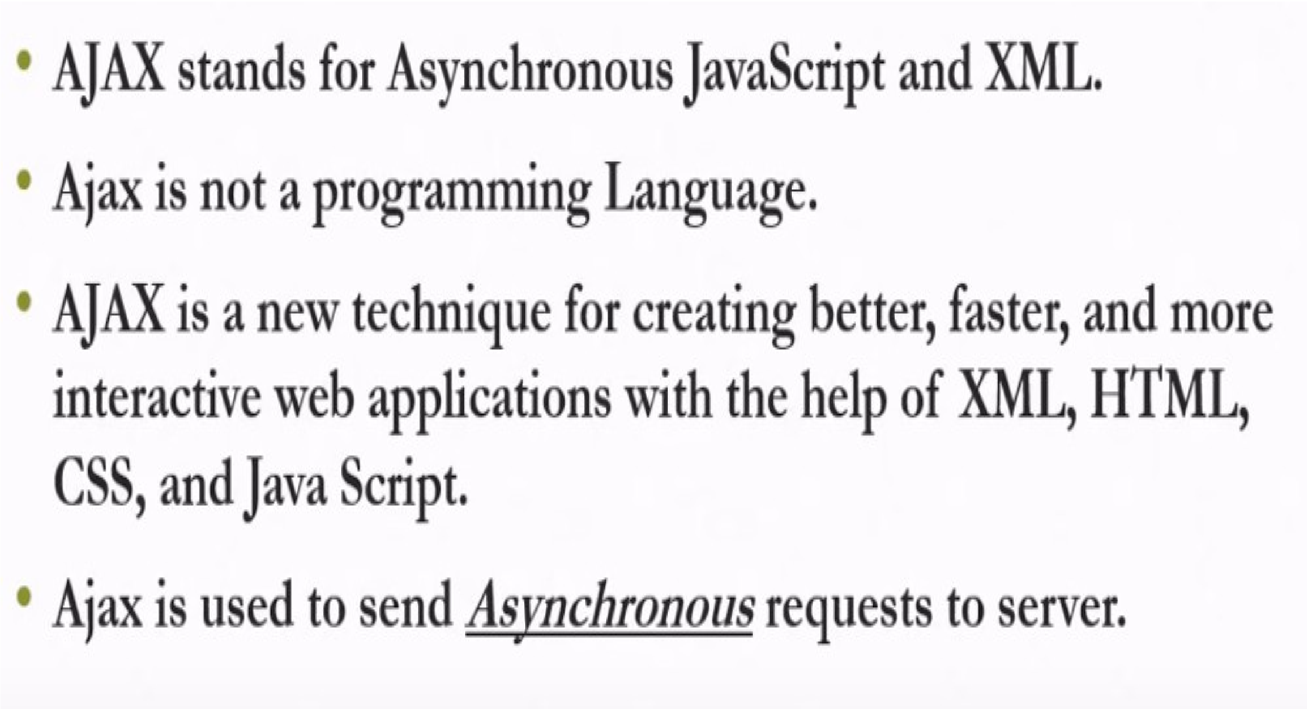
What is Ajax?

- Ajax can help increase the speed and usability of an application's web pages by updating only part of the page at a time, rather than requiring the entire page to be reloaded after a user-initiated change.
- Using Ajax, the pages of your application can exchange small amounts of data with the server without going through a form submit.
- **AJAX is the art of exchanging data with the server and updating part of web pages- without reloading the whole page asynchronously**

The Ajax Technique

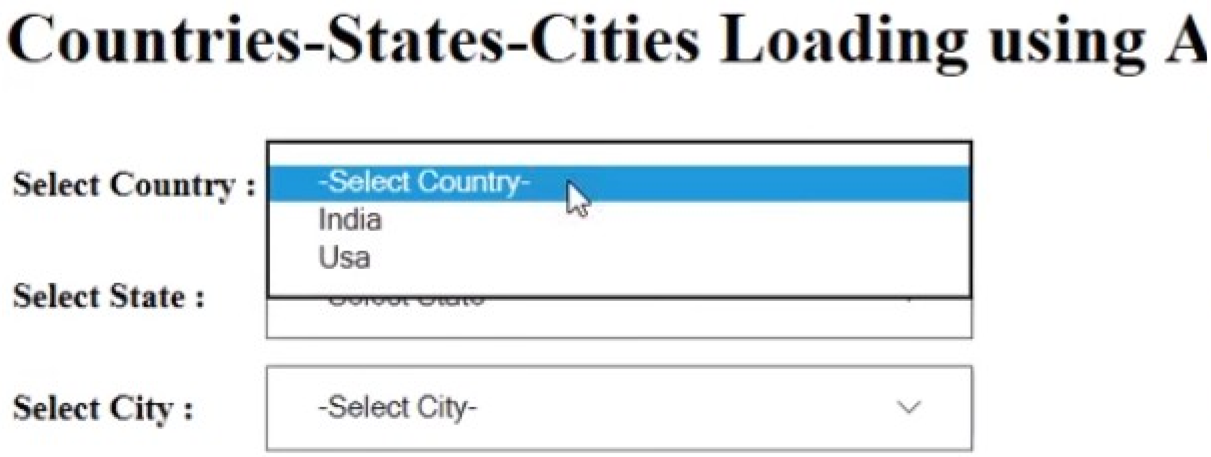
- The Ajax technique accomplishes this by using the following technologies:
  - JavaScript that allows for interaction with the browser and responding to events.
  - DOM for accessing and manipulating the structure of the HTML of the page.
  - XML which represents the data passed between the server and client.
  - An XMLHttpRequest object for asynchronously exchanging the XML data between the client and the server.

Introduction



- AJAX stands for Asynchronous JavaScript and XML.
- Ajax is not a programming Language.
- AJAX is a new technique for creating better, faster, and more interactive web applications with the help of XML, HTML, CSS, and Java Script.
- Ajax is used to send *Asynchronous* requests to server.

Ajax Applications

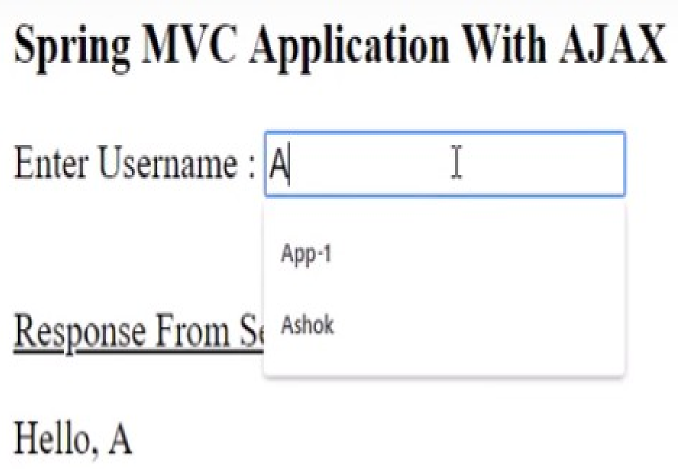


Countries-States-Cities Loading using A

Select Country :

Select State :

Select City : -Select City-



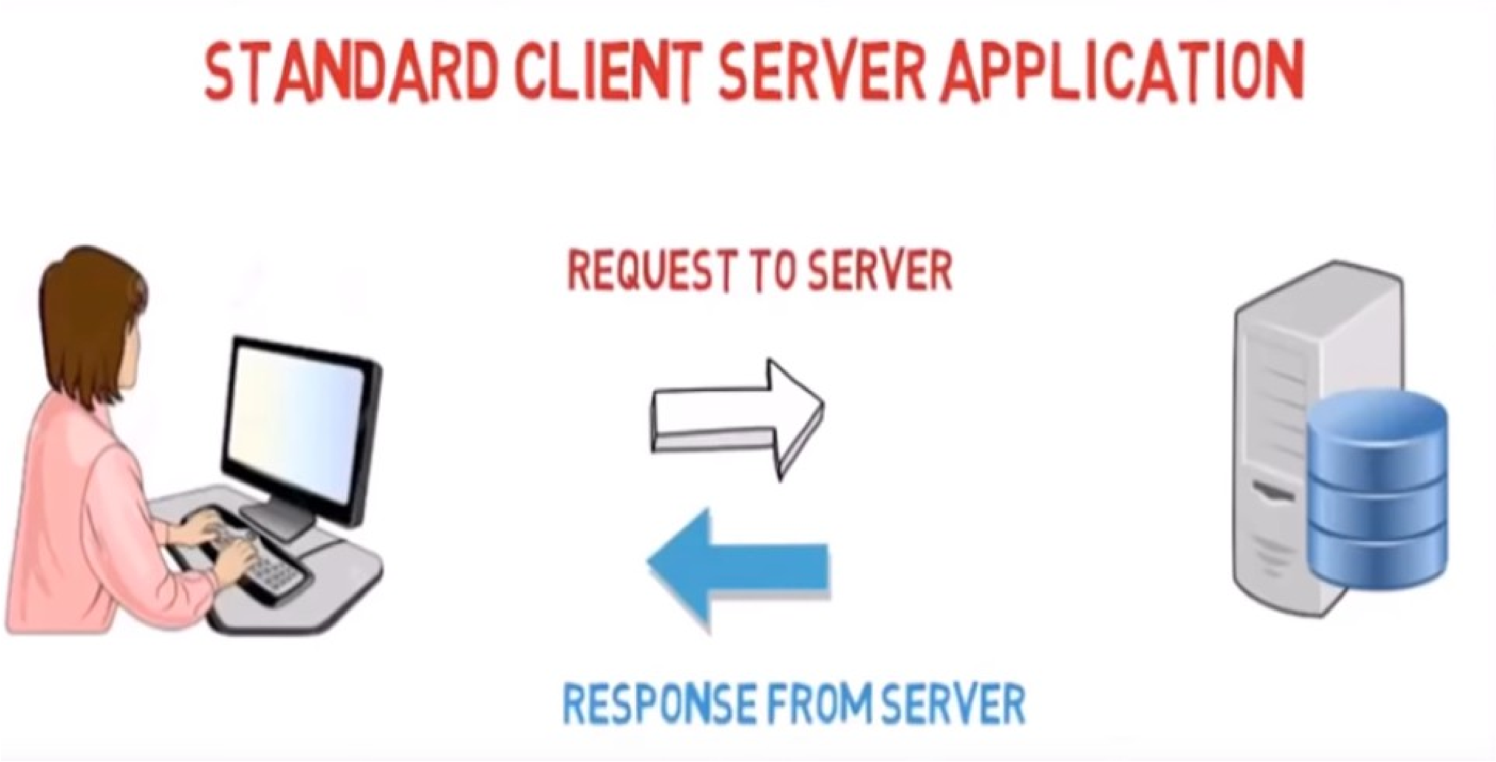
Spring MVC Application With AJAX

Enter Username : A

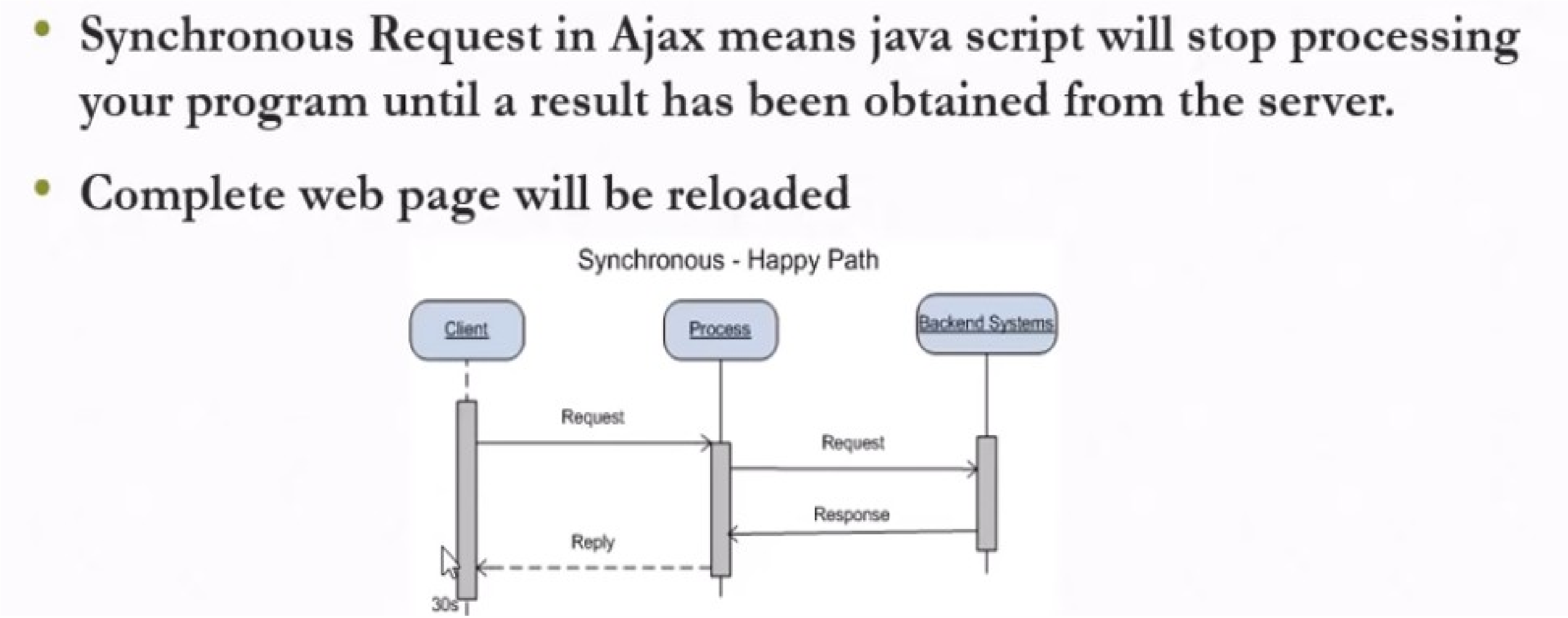
Response From S

Hello, A

Client server communication

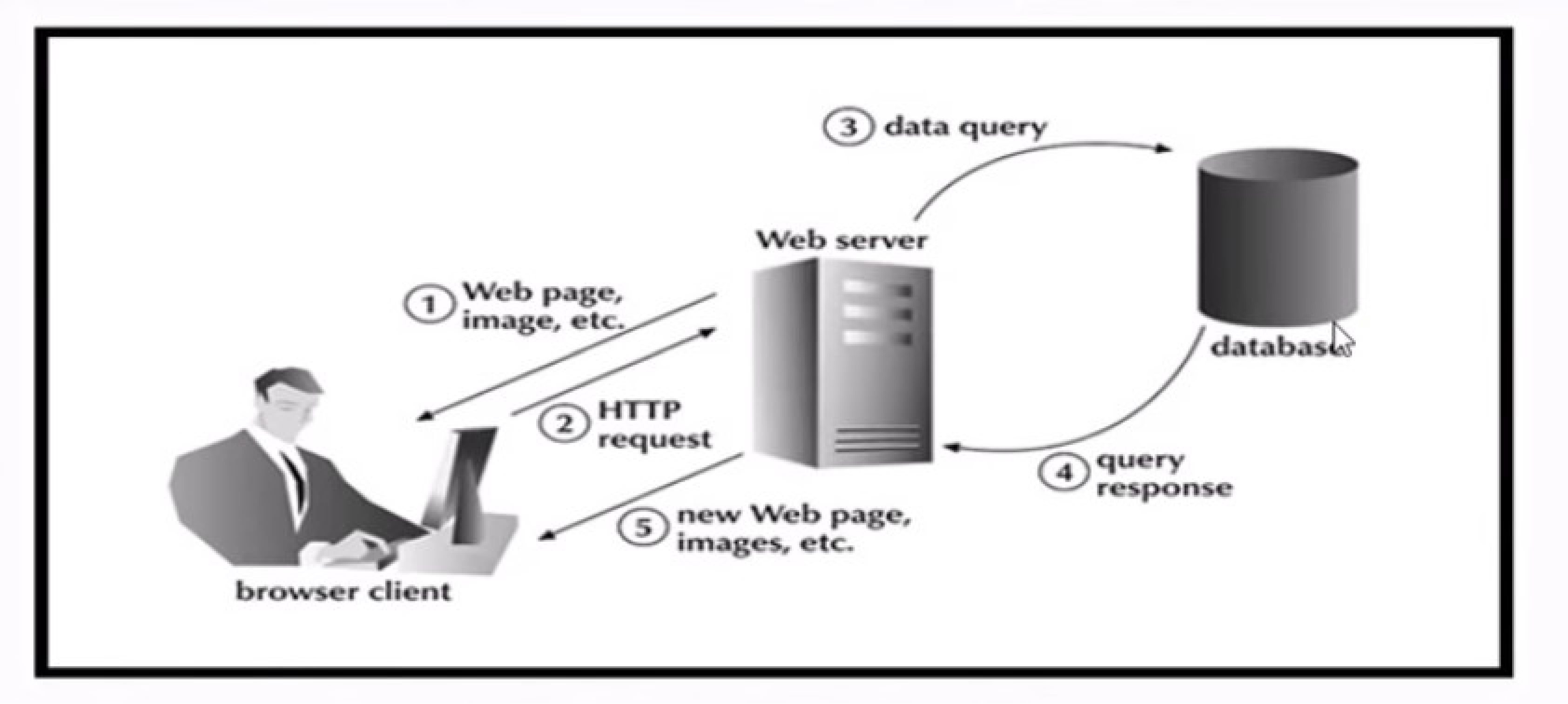


Synchronous request

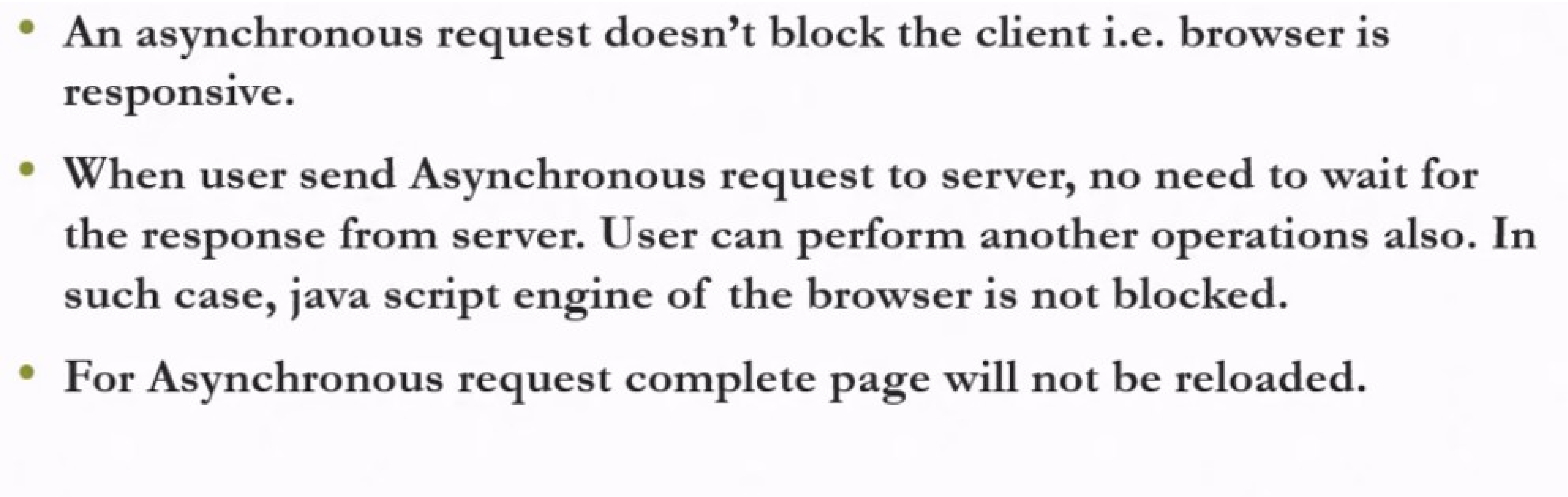


- Synchronous Request in Ajax means java script will stop processing your program until a result has been obtained from the server.
- Complete web page will be reloaded

Synchronous request

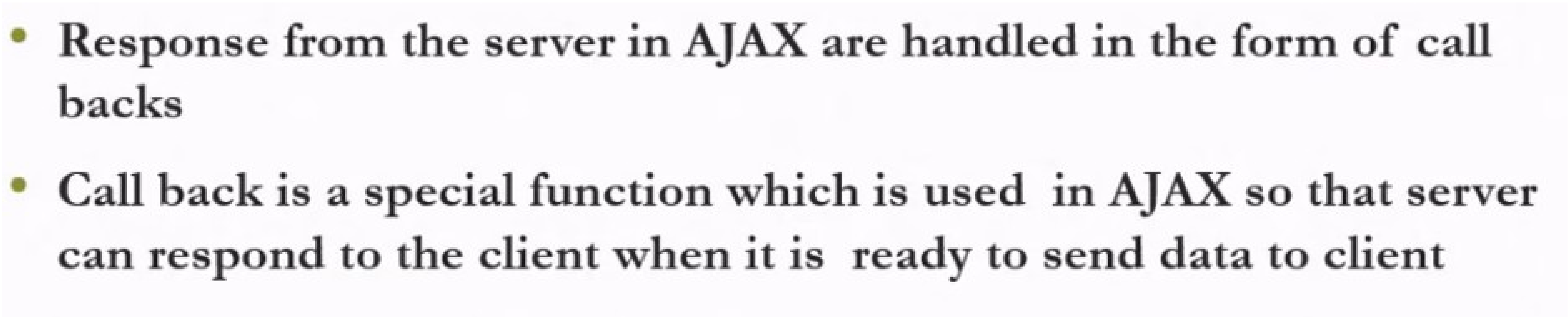


Asynchronous request



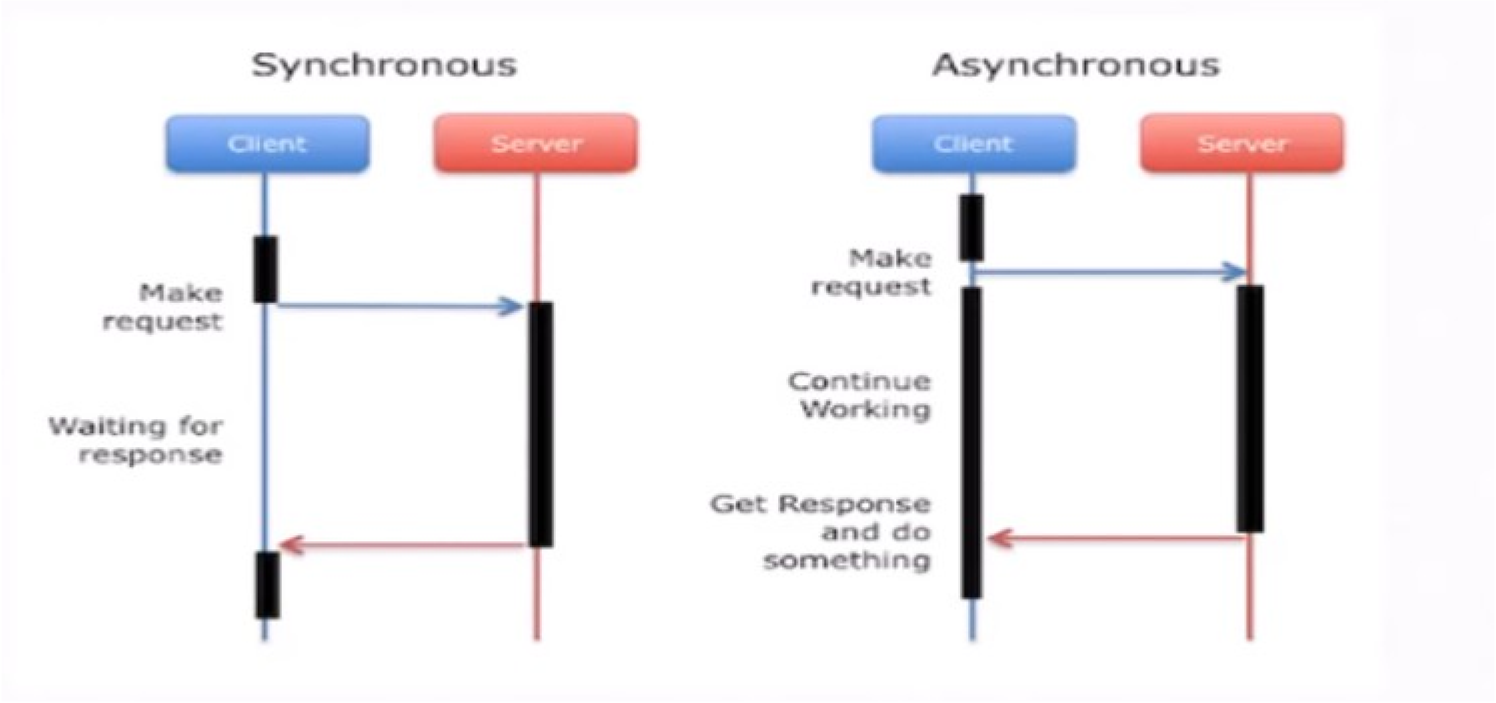
- An asynchronous request doesn’t block the client i.e. browser is responsive.
- When user send Asynchronous request to server, no need to wait for the response from server. User can perform another operations also. In such case, java script engine of the browser is not blocked.
- For Asynchronous request complete page will not be reloaded.

How response will be handled in Async request?

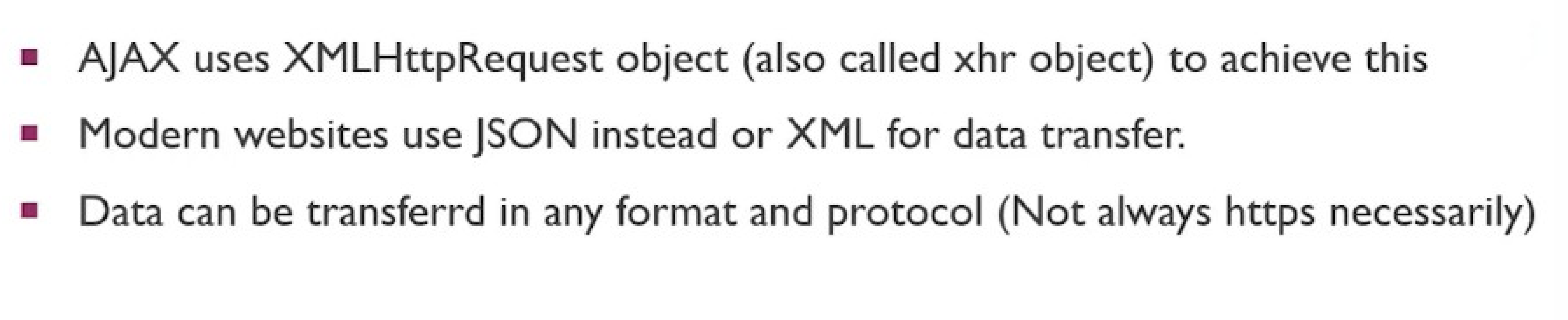


- Response from the server in AJAX are handled in the form of call backs
- Call back is a special function which is used in AJAX so that server can respond to the client when it is ready to send data to client

Sych vs Asynch

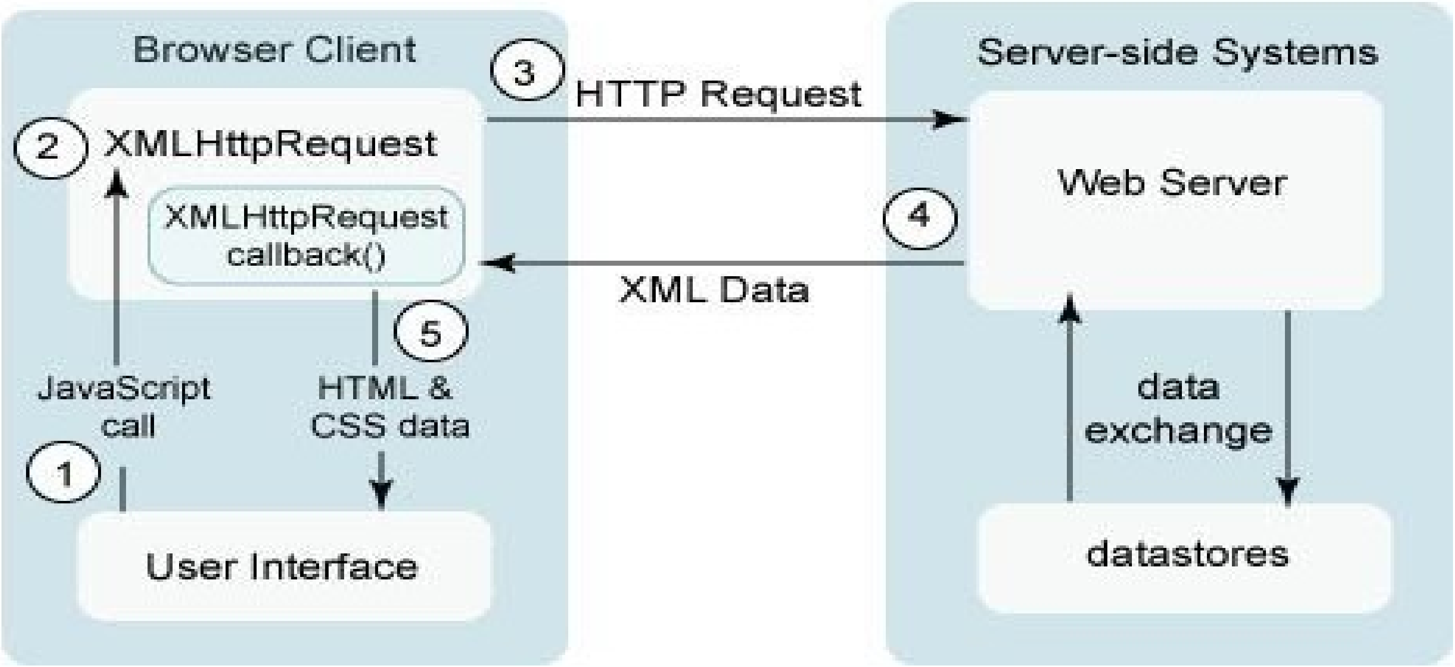


Ajax with xhr object



- AJAX uses XMLHttpRequest object (also called xhr object) to achieve this
- Modern websites use JSON instead or XML for data transfer.
- Data can be transferrd in any format and protocol (Not always https necessarily)

AJAX Request



Source: http://java.sun.com/javaee/javaserverfaces/ajax/tutorial.jsp

Ajax steps

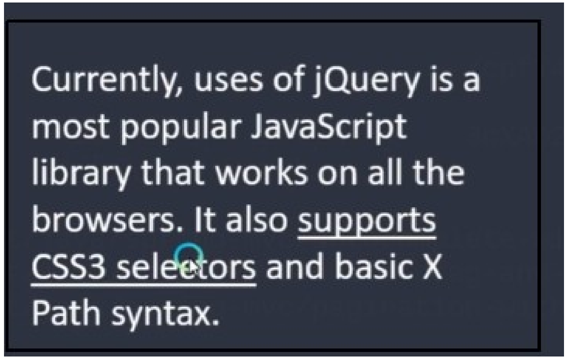
- **JavaScript**
    - Define an object for sending HTTP requests
    - Initiate request
        - Get request object
        - Designate a request handler function
            - Supply as onreadystatechange attribute of request
        - Initiate a GET or POST request to a JSP page
        - Send data
    - Handle response
        - Wait for readyState of 4 and HTTP status of 200
        - Extract return text with responseText or responseXML
        - Do something with result
- **HTML**
    - Loads JavaScript from centralized directory
    - Designates control that initiates request
    - Gives ids to input elements that will be read by script

Ajax hello world

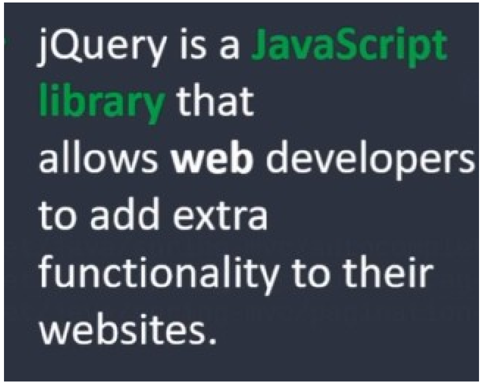
```
var ajaxObject=null;

if (window.XMLHttpRequest)
ajaxObject=new XMLHttpRequest();

if(ajaxObject!=null){
/*Open an GET request for resource url asynch.*/
ajaxObject.open("GET",url,true);  ajaxObject.send();
}
else{
alert("Not having suitable browser ...");
}
```

```
ajaxObject.onreadystatechange=function()
{
    if(ajaxObject.readyState==4 && ajaxObject.status==200){
    document.getElementById(id).innerHTML=ajaxObject.responseText;
    }
};
```

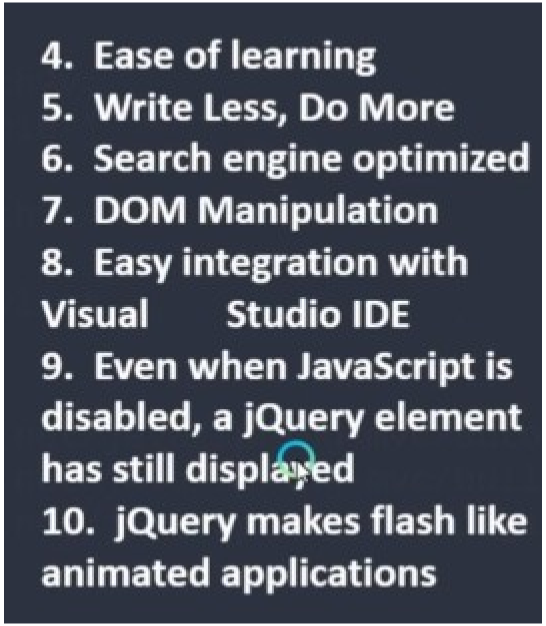
JQuery



Currently, uses of jQuery is a most popular JavaScript library that works on all the browsers. It also supports CSS3 selectors and basic X Path syntax.

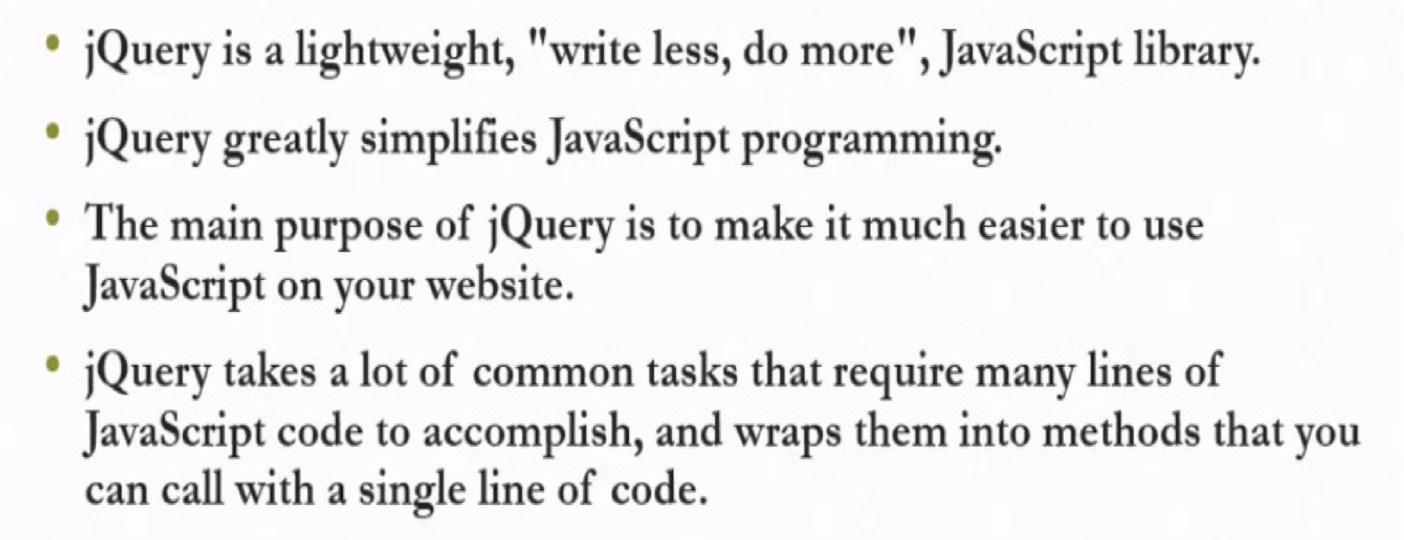


jQuery is a JavaScript library that allows **web** developers to add extra functionality to their websites.

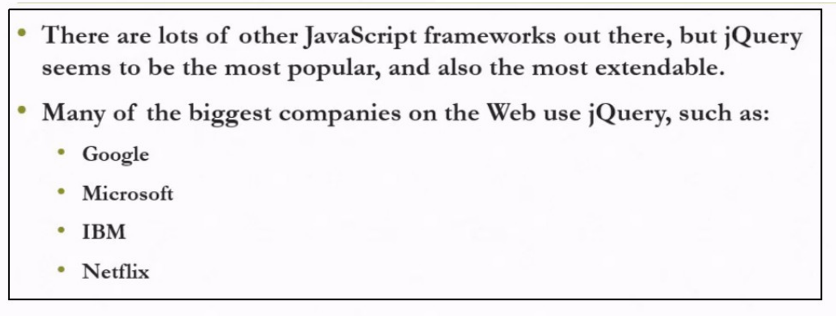


4. Ease of learning
5. Write Less, Do More
6. Search engine optimized
7. DOM Manipulation
8. Easy integration with Visual Studio IDE
9. Even when JavaScript is disabled, a jQuery element has still displayed
10. jQuery makes flash like animated applications

What is jQuery?

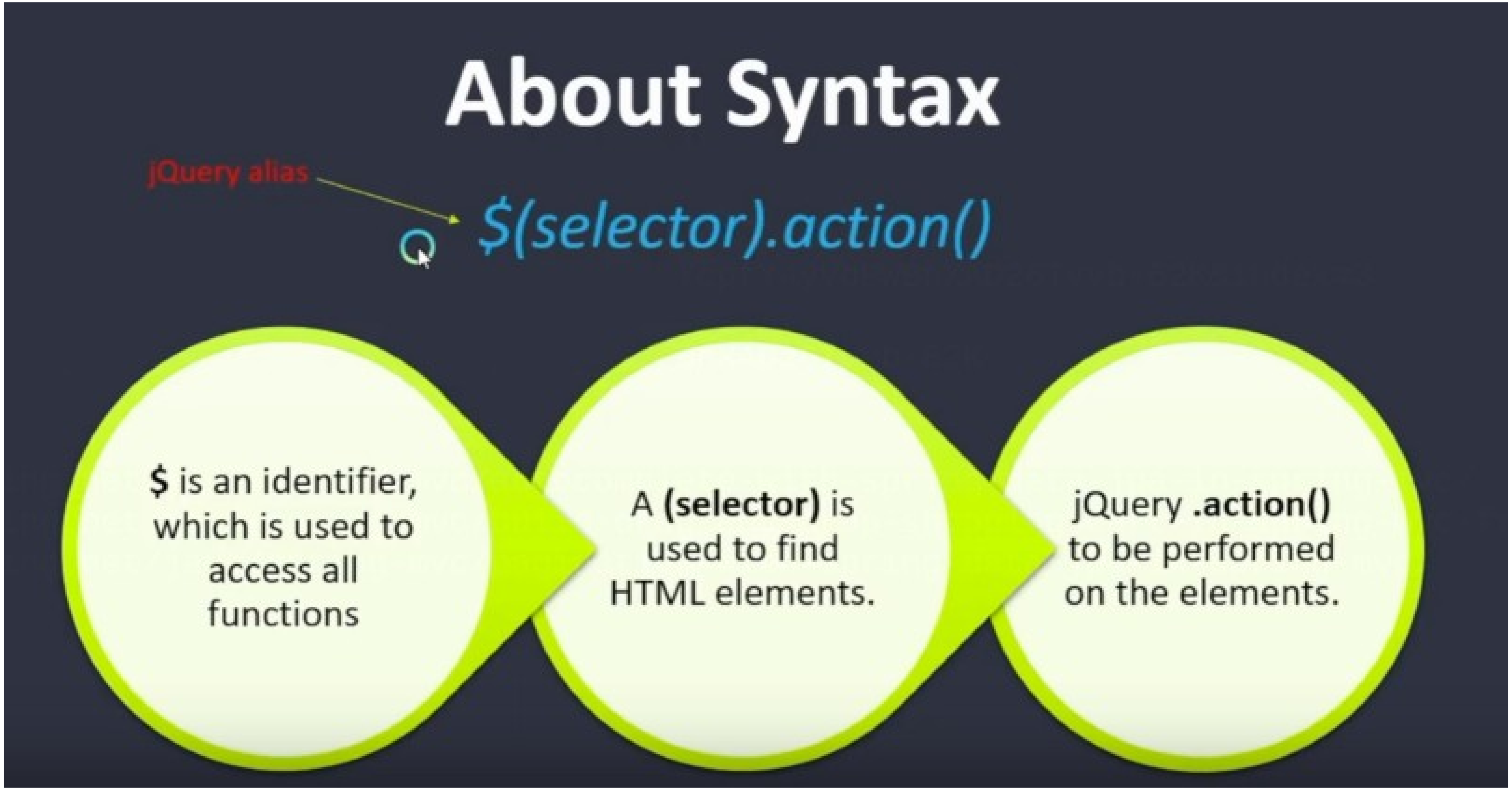


- jQuery is a lightweight, "write less, do more", JavaScript library.
- jQuery greatly simplifies JavaScript programming.
- The main purpose of jQuery is to make it much easier to use JavaScript on your website.
- jQuery takes a lot of common tasks that require many lines of JavaScript code to accomplish, and wraps them into methods that you can call with a single line of code.



- There are lots of other JavaScript frameworks out there, but jQuery seems to be the most popular, and also the most extendable.
- Many of the biggest companies on the Web use jQuery, such as:
  - Google
  - Microsoft
  - IBM
  - Netflix

jQuery syntax



About Syntax

jQuery alias

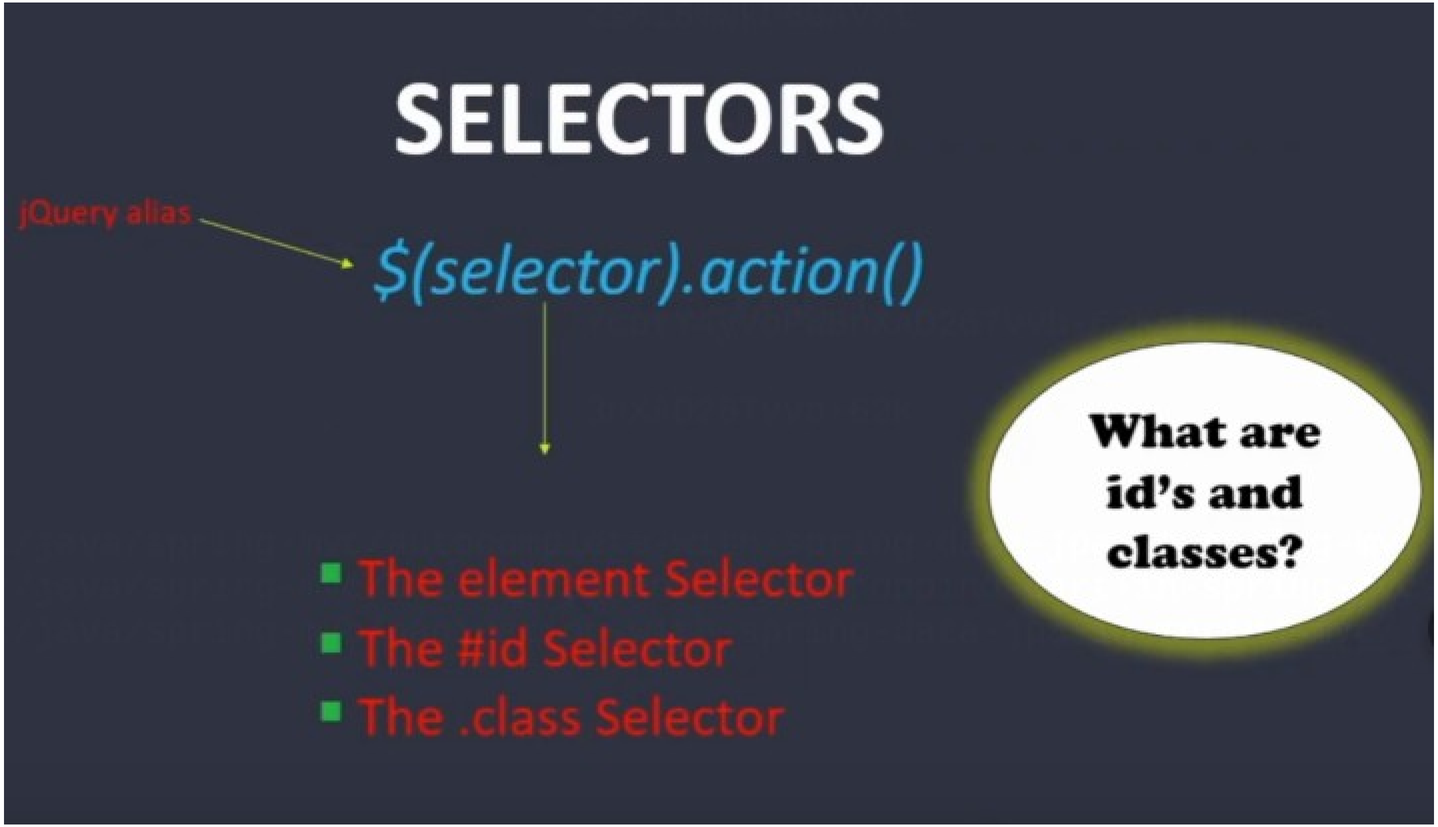
$(selector).action()

$ is an identifier, which is used to access all functions

A **(selector)** is used to find HTML elements.

jQuery **.action()** to be performed on the elements.

jQuery selectors



SELECTORS

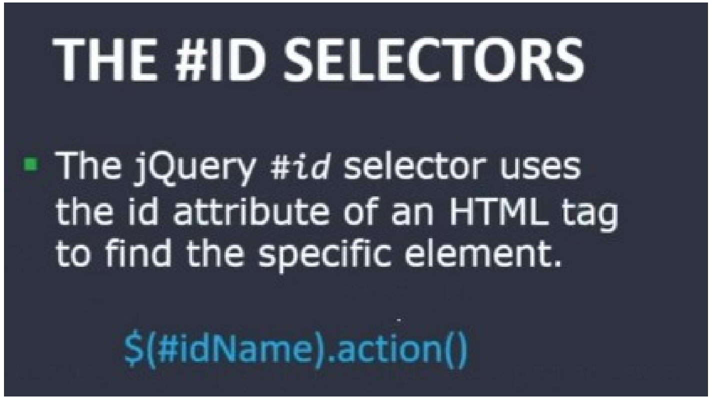
jQuery alias

$(selector).action()

- The element Selector
- The #id Selector
- The .class Selector

What are id's and classes?

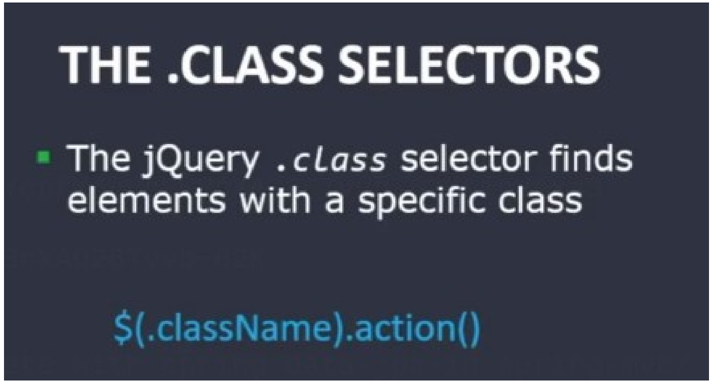
jQuery selectors



THE #ID SELECTORS

- The jQuery *#id* selector uses the id attribute of an HTML tag to find the specific element.

```
$(#idName).action()
```

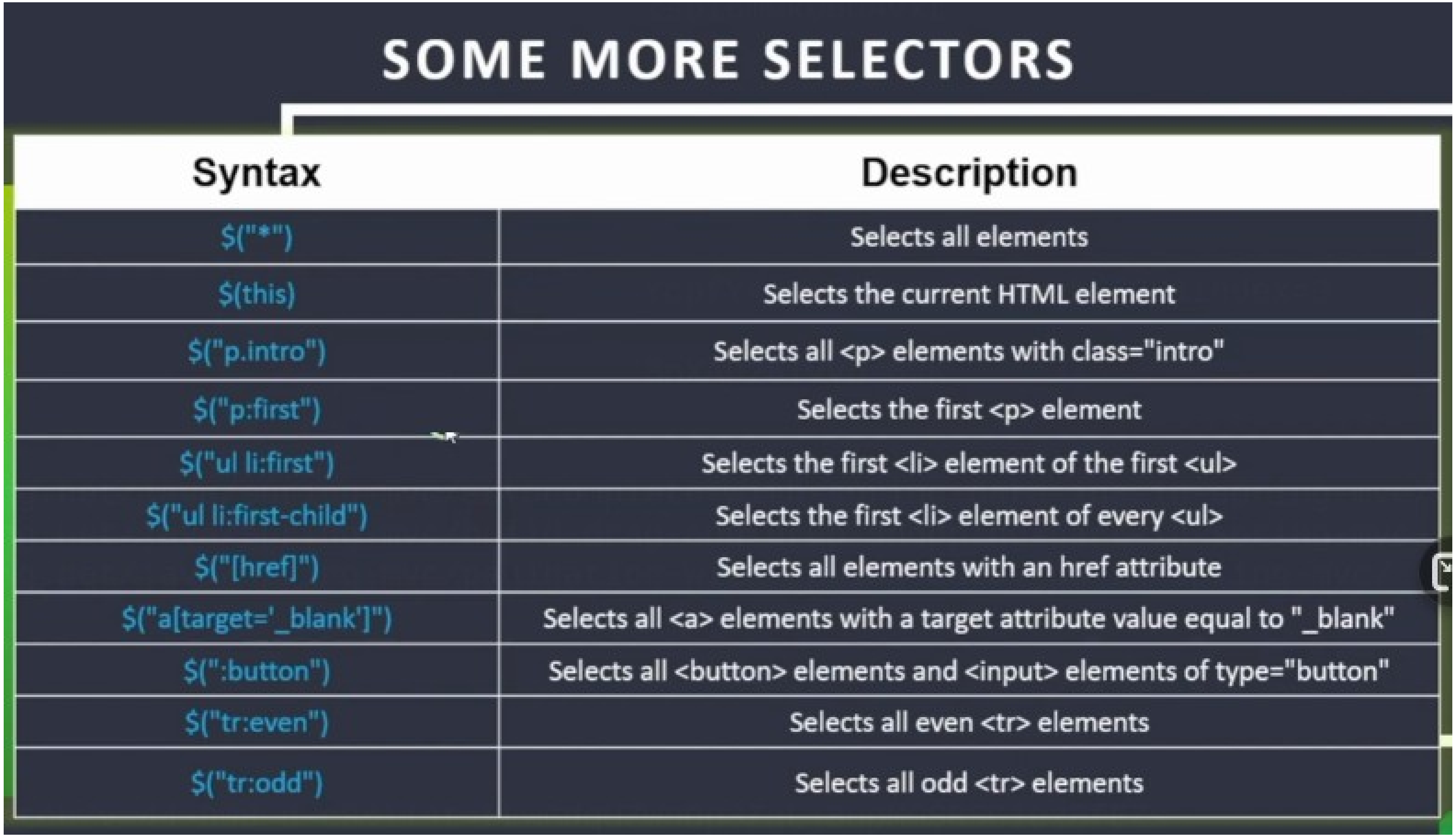


THE .CLASS SELECTORS

- The jQuery *.class* selector finds elements with a specific class

```
$(.className).action()
```

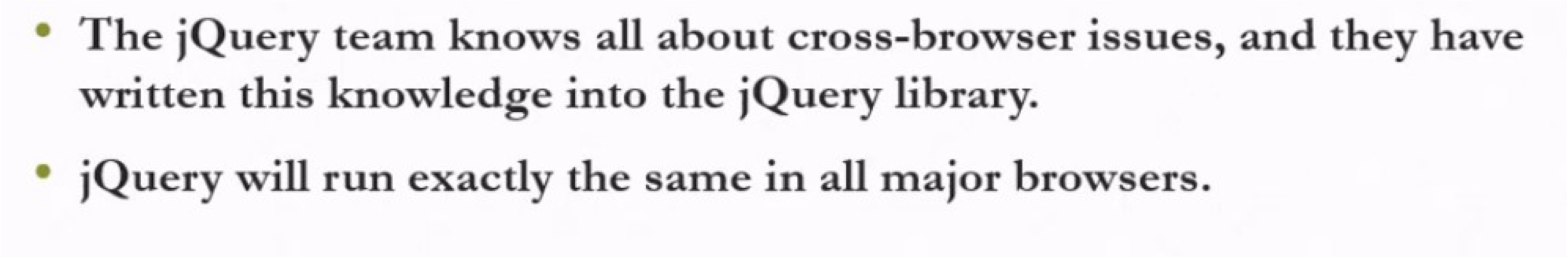
Some selectors



SOME MORE SELECTORS

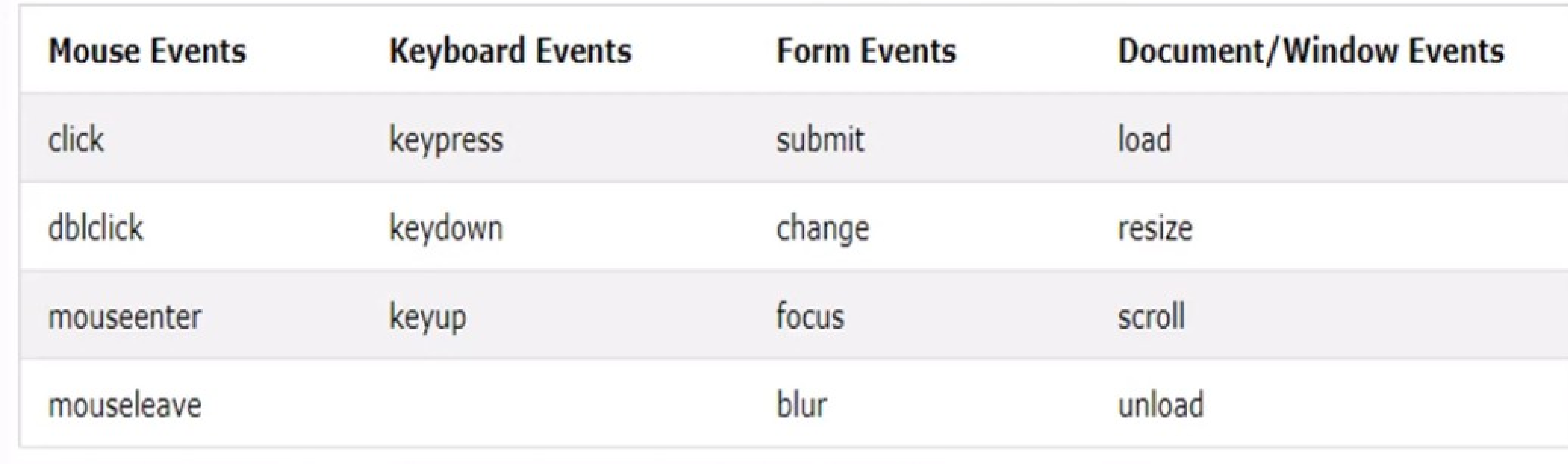
Syntax	Description
$("*")	Selects all elements
$(this)	Selects the current HTML element
$("p.intro")	Selects all <p> elements with class="intro"
$("p:first")	Selects the first <p> element
$("ul li:first")	Selects the first <li> element of the first <ul>
$("ul li:first-child")	Selects the first <li> element of every <ul>
$("[href]")	Selects all elements with an href attribute
$("a[target='_blank']")	Selects all <a> elements with a target attribute value equal to "_blank"
$(":button")	Selects all <button> elements and <input> elements of type="button"
$("tr:even")	Selects all even <tr> elements
$("tr:odd")	Selects all odd <tr> elements

Will jQuery work with all browers?

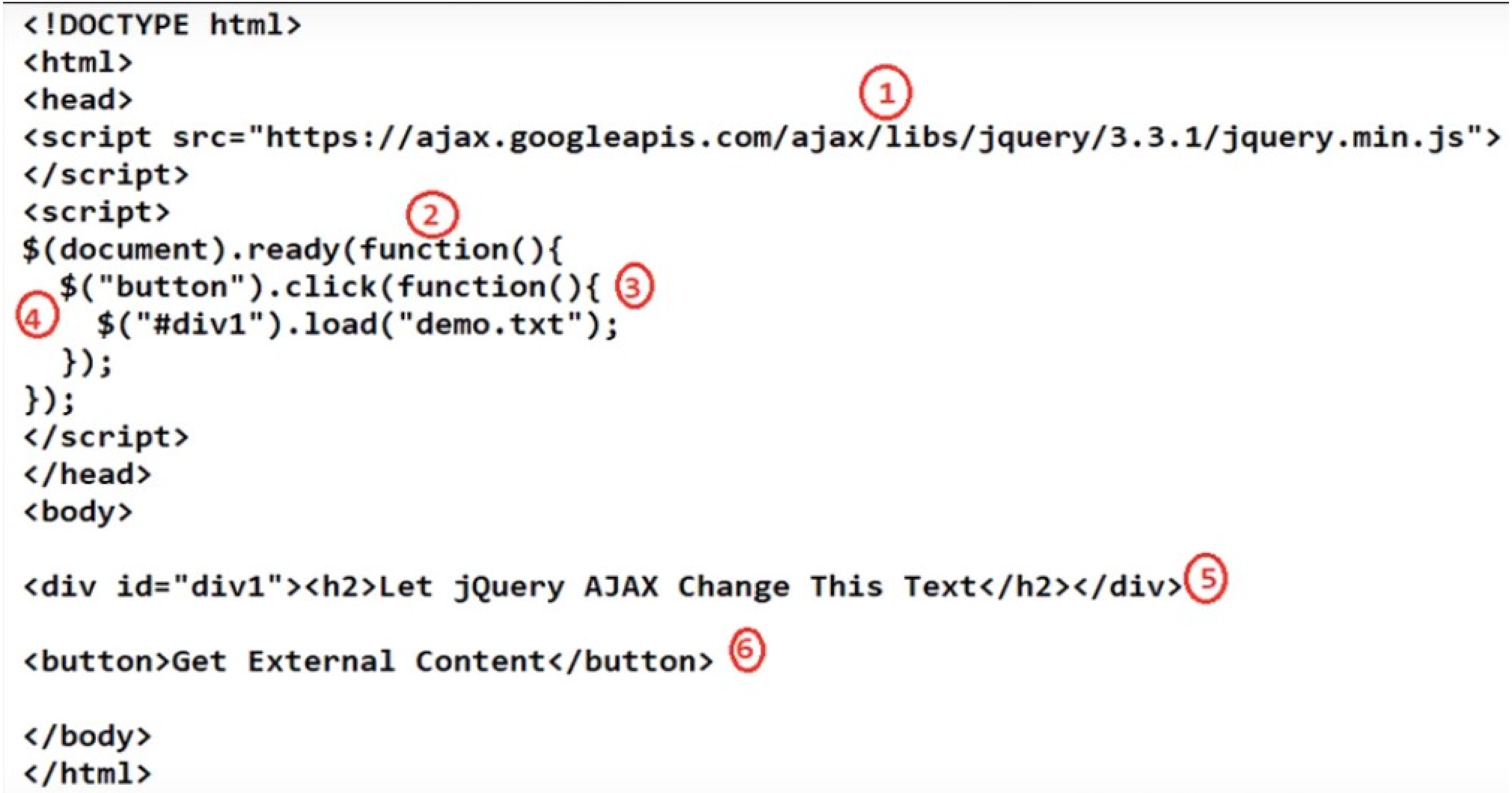


- The jQuery team knows all about cross-browser issues, and they have written this knowledge into the jQuery library.
- jQuery will run exactly the same in all major browsers.

Common dom events

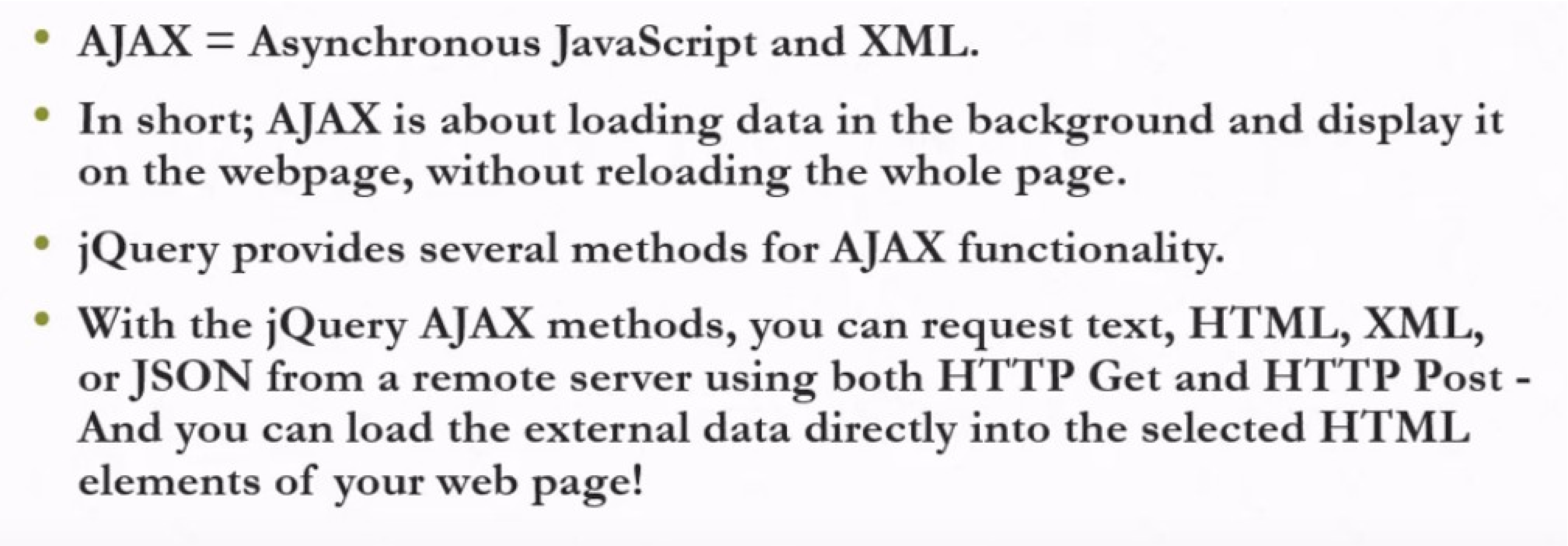


Mouse Events	Keyboard Events	Form Events	Document/Window Events
click	keypress	submit	load
dblclick	keydown	change	resize
mouseenter	keyup	focus	scroll
mouseleave		blur	unload



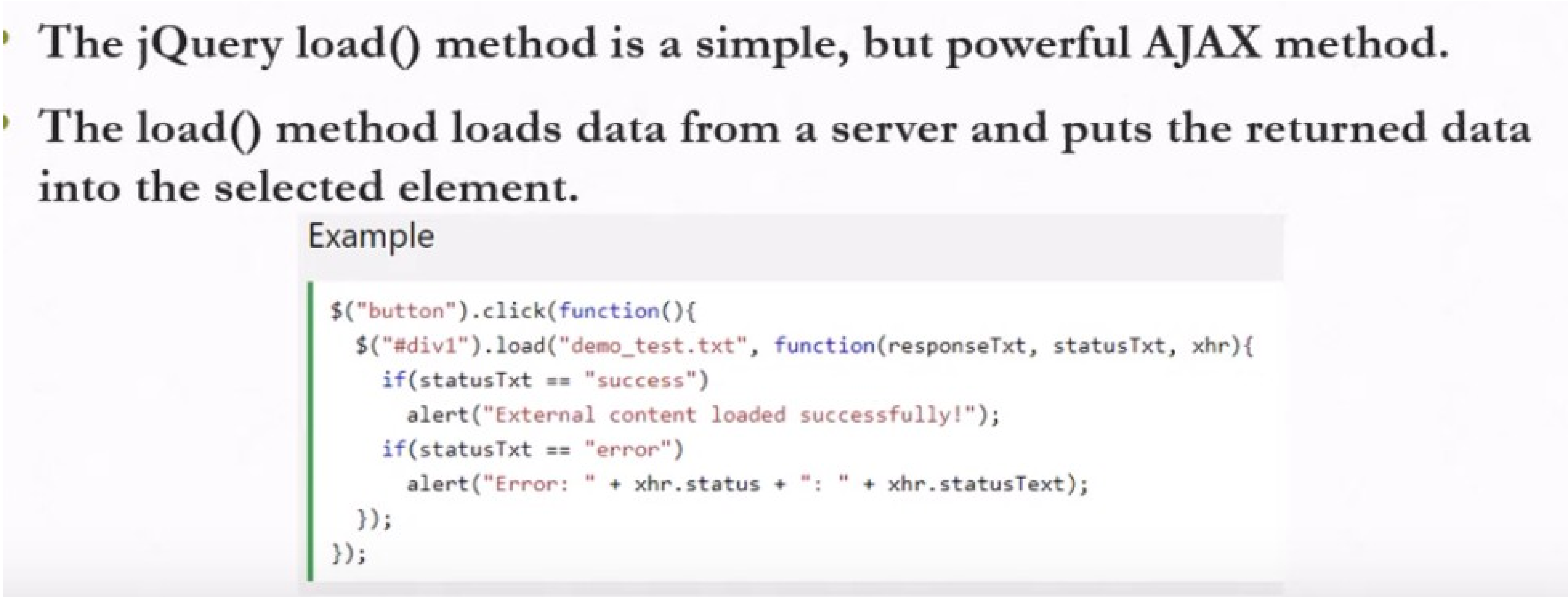
```
<!DOCTYPE html>
<html>
<head>
<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.3.1/jquery.min.js">
</script>
<script>
$(document).ready(function(){
  $("button").click(function(){
    $("#div1").load("demo.txt");
  });
});
</script>
</head>
<body>

<div id="div1"><h2>Let jQuery AJAX Change This Text</h2></div>

<button>Get External Content</button>

</body>
</html>
```

Ajax with jQuery



- AJAX = Asynchronous JavaScript and XML.
- In short; AJAX is about loading data in the background and display it on the webpage, without reloading the whole page.
- jQuery provides several methods for AJAX functionality.
- With the jQuery AJAX methods, you can request text, HTML, XML, or JSON from a remote server using both HTTP Get and HTTP Post - And you can load the external data directly into the selected HTML elements of your web page!

jQuery load method

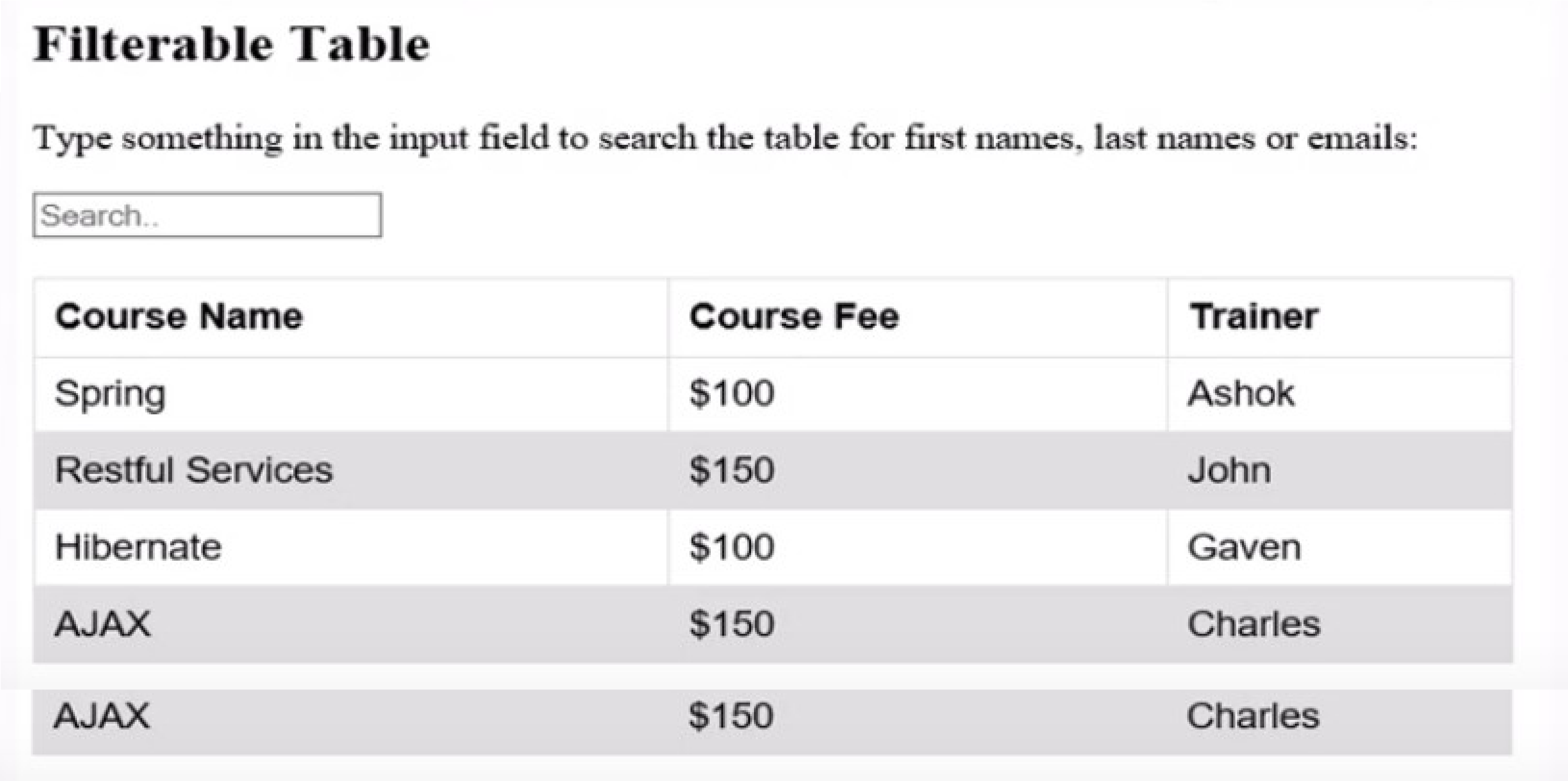


- The jQuery load() method is a simple, but powerful AJAX method.
- The load() method loads data from a server and puts the returned data into the selected element.

Example

```
$("button").click(function(){
  $("#div1").load("demo_test.txt", function(responseTxt, statusTxt, xhr){
    if(statusTxt == "success")
      alert("External content loaded successfully!");
    if(statusTxt == "error")
      alert("Error: " + xhr.status + ": " + xhr.statusText);
  });
});
```

jQuery table filtering



Filterable Table

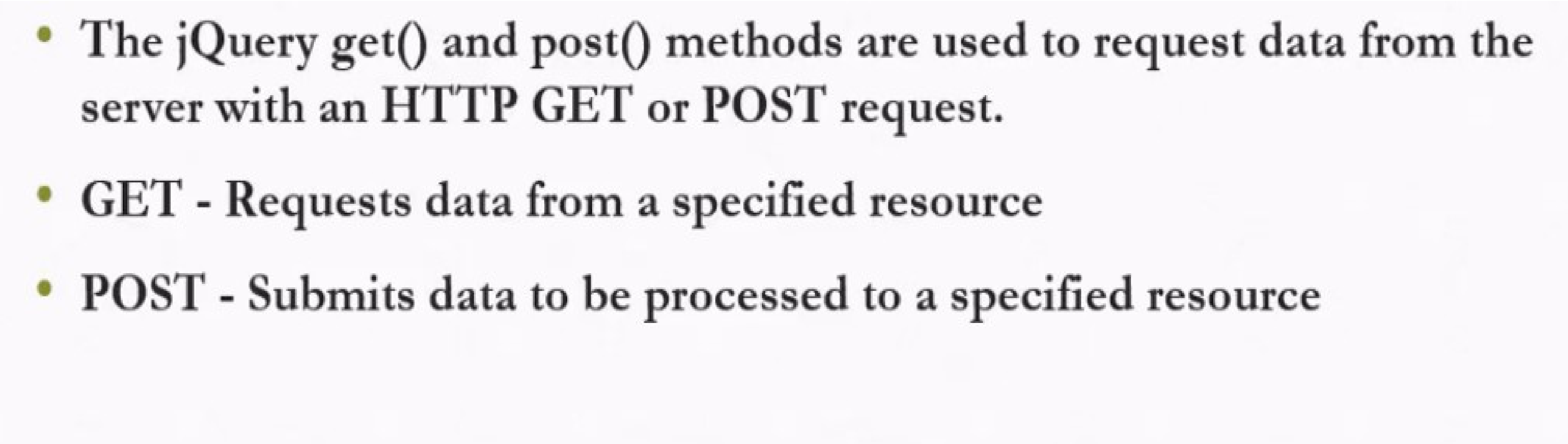
Type something in the input field to search the table for first names, last names or emails:

Search..

Course Name	Course Fee	Trainer
Spring	$100	Ashok
Restful Services	$150	John
Hibernate	$100	Gaven
AJAX	$150	Charles

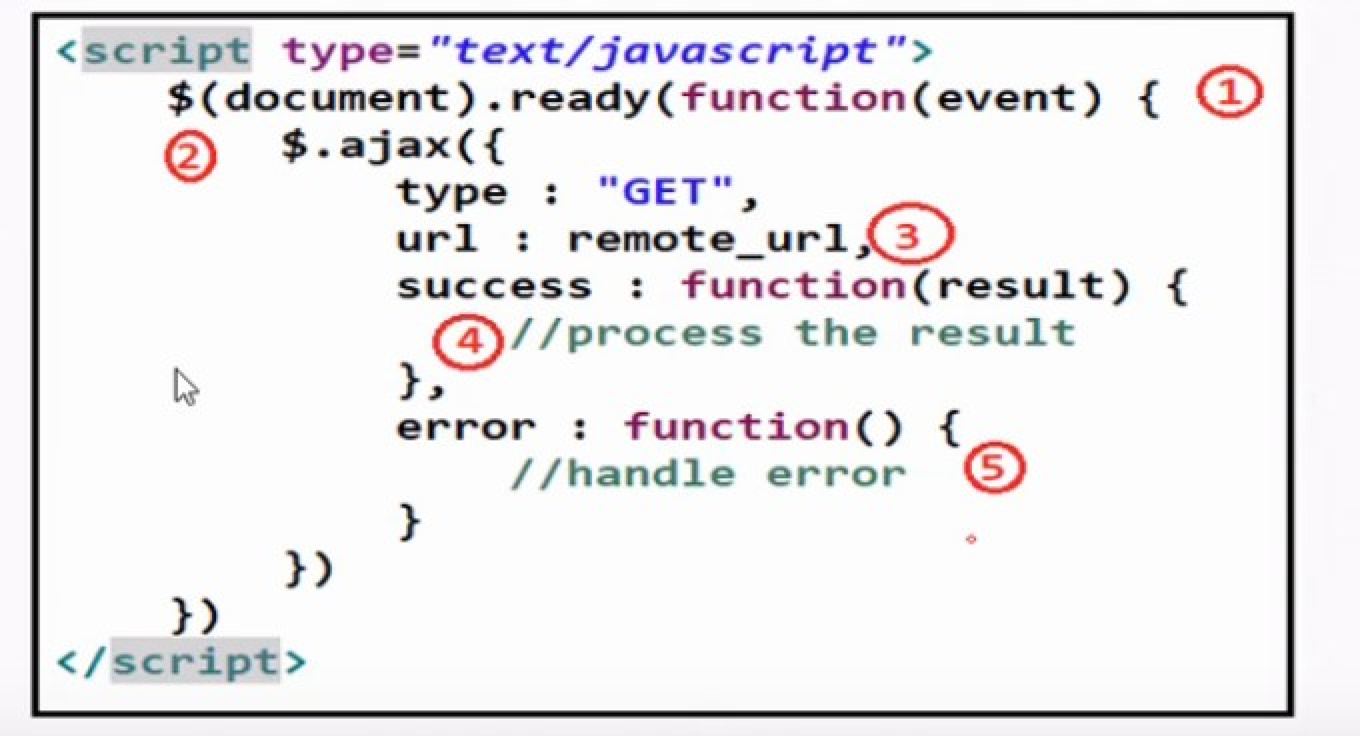
AJAX $150 Charles

jQuery get and post method

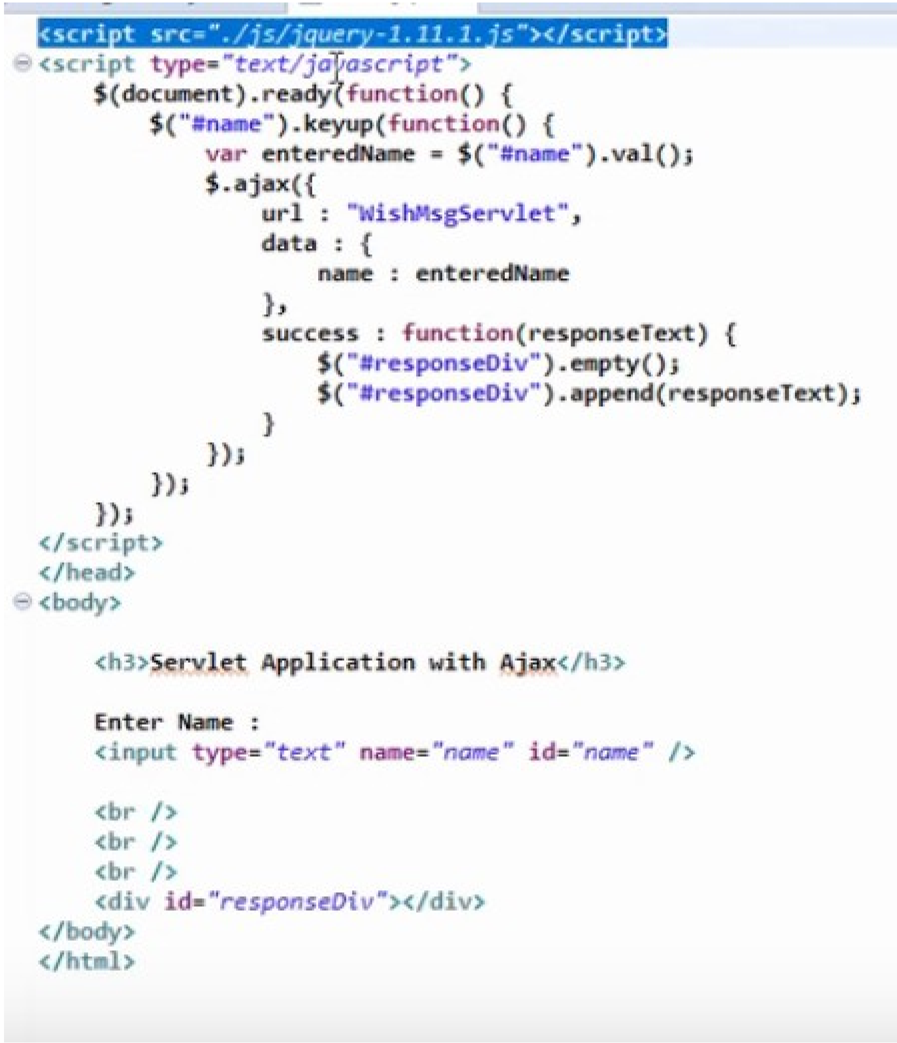


- The jQuery get() and post() methods are used to request data from the server with an HTTP GET or POST request.
- GET - Requests data from a specified resource
- POST - Submits data to be processed to a specified resource

Ajax with jQuery

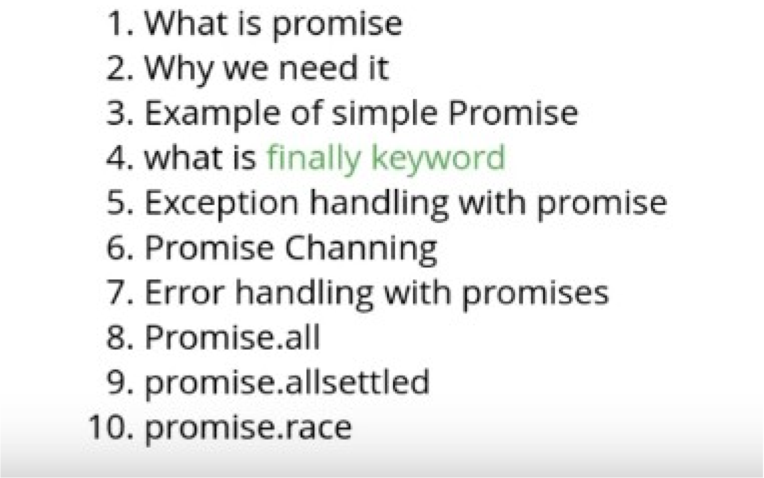


```
<script type="text/javascript">
    $(document).ready(function(event) {
        $.ajax({
            type : "GET",
            url : remote_url,
            success : function(result) {
                //process the result
            },
            error : function() {
                //handle error
            }
        })
    })
</script>
```



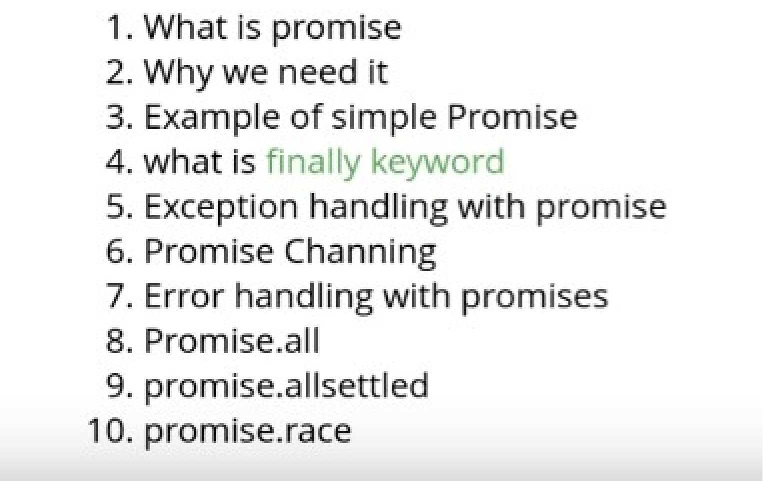
```
<script src="./js/jquery-1.11.1.js"></script>
<script type="text/javascript">
    $(document).ready(function() {
        $("#name").keyup(function() {
            var enteredName = $("#name").val();
            $.ajax({
                url : "WishMsgServlet",
                data : {
                    name : enteredName
                },
                success : function(responseText) {
                    $("#responseDiv").empty();
                    $("#responseDiv").append(responseText);
                }
            });
        });
    });
</script>
</head>
<body>

    <h3>Servlet Application with Ajax</h3>

    Enter Name :
    <input type="text" name="name" id="name" />

    <br />
    <br />
    <br />
    <div id="responseDiv"></div>
</body>
</html>
```

Ajax with promise

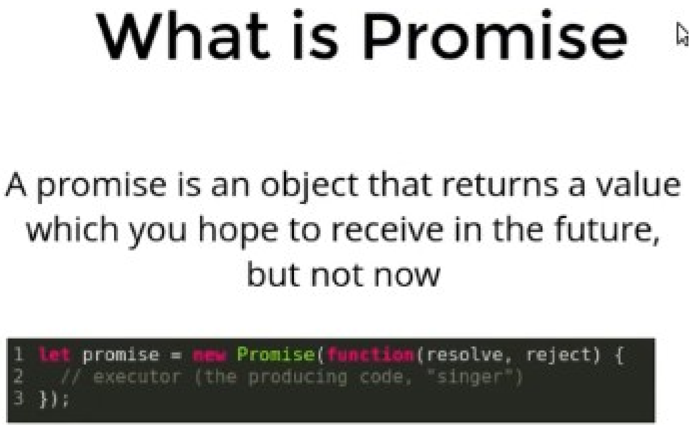


1. What is promise
2. Why we need it
3. Example of simple Promise
4. what is finally keyword
5. Exception handling with promise
6. Promise Channing
7. Error handling with promises
8. Promise.all
9. promise.allsettled
10. promise.race

Ajax with promise



1. What is promise
2. Why we need it
3. Example of simple Promise
4. what is finally keyword
5. Exception handling with promise
6. Promise Channing
7. Error handling with promises
8. Promise.all
9. promise.allsettled
10. promise.race



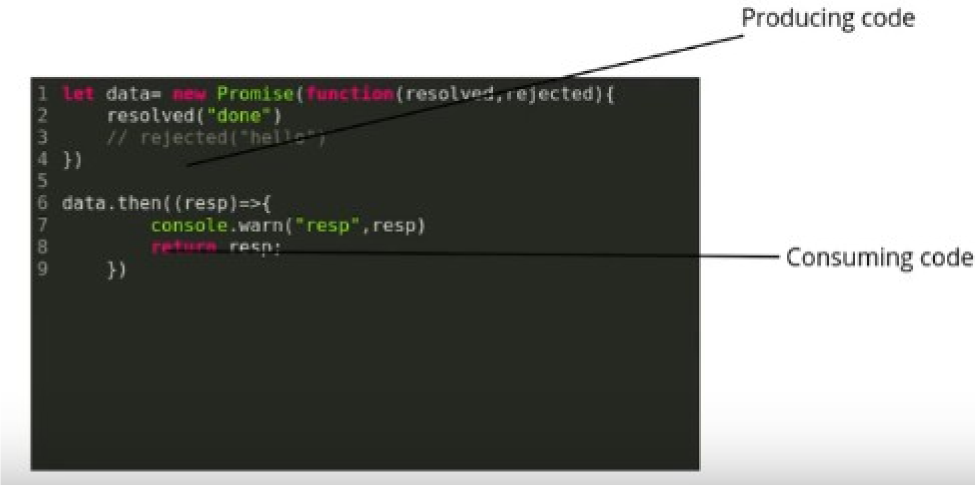
What is Promise

A promise is an object that returns a value which you hope to receive in the future, but not now

```
let promise = new Promise(function(resolve, reject) {
  // executor (the producing code, "singer")
});
```

Why need Promise

JavaScript is always **synchronous** and single-threaded language. it means JavaScript never wait for code or function result when they take some time. Js direct excute next code



```
let data= new Promise(function(resolved,rejected){
    resolved("done")
    // rejected("hello")
})

data.then((resp)=>{
        console.warn("resp",resp)
        return resp;
    })
```

Producing code

Consuming code