# Basics of JavaScript

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# What is JavaScript?

JavaScript is a client side scripting language for use in HTML pages

JavaScript was designed to add interactivity to HTML pages

Invented in 1995 at Netscape Corporation (LiveScript)

JavaScript has nothing to do with Java

JavaScript is an interpreted language (means that scripts execute without preliminary compilation)

All modern browsers come with a JavaScript engine

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JavaScript can calculate and process data

JavaScript can create and read cookies

JavaScript can manipulate the DOM (Document Object Model is an interface to access data in a HTML or XML document)

JavaScript can control some parts of the browser, like opening windows, access to history, etc.

JavaScript can respond to events

JavaScript can read the user agent string

# What can JavaScript Do?

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JavaScript can validate form data

JavaScript can open new windows

JavaScript can use events, e.g. to follow the mouse pointer, acting on clicks or pressing keys, switch button colour, etc

JavaScript can change the layout of the website, e.g. animations, better look and feel for mobile devices, etc

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Pros:

Allows more dynamic HTML pages, even complete web applications

Cons:

Requires a JavaScript-enabled browser

Requires a client who trusts the server enough to run the code the server provides

# Pros and Cons of JavaScript

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# Adding JavaScript to HTML

JavaScript can be inserted into documents by using the SCRIPT tag

You can have any number of scripts

Scripts can be placed in the HEAD or in the BODY

- In the HEAD, scripts are run before the page is displayed
- In the BODY, scripts are run as the page is displayed

```html
json_helloworld.html  ×
1  <!DOCTYPE html>
2  <html>
3      <head>
4          <title>Test Javascript</title>
5          <script type="text/javascript">
6
7              var o = {"Hello":"World"};
8
9              alert(o.Hello);
10
11         </script>
12     </head>
13     <body>
14         <h2>JSON Hello World</h2>
15         <p>This is a test program to alert Hello World!</p>
16     </body>
17 </html>
18
```

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Scripts can also be loaded from an external file

This is useful if you have a complicated script or set of subroutines that are used in several different documents

```html
index.html
1  <!DOCTYPE html>
2  <html>
3  <head>
4  <title>Page Title</title>
5
6
7  <script type="text/javascript">
8      alert("Un mensaje de prueba");
9  </script>
10
11
12
13 <script type="text/javascript" src="nombre.js"></script>
14
15
16
17 </head>
18 <body>
19
20 <h1>This is a Heading</h1>
21 <p>This is a paragraph.</p>
22
23 <button onclick="alert('Un mensaje de prueba')">click aquí</button>
24
25 </body>
26 </html>
```

# External Scripts

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# JavaScript Variables

Variables are placeholders for (dynamic) values

Variable names are case sensitive (y and Y are two different variables)

Variable names must begin with a letter or the underscore character

No special characters are allowed

Some reserved words can not be used (function, new, etc.)

Declaration with keyword "var"

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Global variables
- Everywhere accessible and can be changed all the time
- Has to be declared in the main context outside of any function

Local variables
- Defined within a function
- Only accessible within this function

# Global and Local Variables

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| Data Type | Description |
|-----------|-------------|
| String | represents sequence of characters e.g. "hello" |
| Number | represents numeric values e.g. 100 |
| Boolean | represents boolean value either false or true |
| Undefined | represents undefined value |
| Null | represents null i.e. no value at all |
| Array | represents group of similar values |

# JavaScript Data Types 11

# JavaScript Operators and Constructs

JavaScript has most of the operators we're used to from C++/Java
- Arithmetic (+, - ,*, /, %)
- Assignment (=, += , -=,*= /=, %=, ++, --)
- Logical (&&, ||)
- Comparison (<, >, <=, >=,==)

Constructs:
- if, else, while, for, switch, case

Comments in JavaScript are delimited with // and /* */ as in Java and C++

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# JavaScript Arrays

Each element referenced by a number
- Start at "zeroth element"
- Accessing a specific element

Name of array
- Brackets
- Number of element

Arrays know their length
- length property

| | |
|---|---|
| Name of array → | c[ 0 ] : −45 |
| | c[ 1 ] : 6 |
| | c[ 2 ] : 0 |
| | c[ 3 ] : 72 |
| | c[ 4 ] : 1543 |
| | c[ 5 ] : −89 |
| | c[ 6 ] : 0 |
| | c[ 7 ] : 62 |
| | c[ 8 ] : −3 |
| | c[ 9 ] : 1 |
| Position number (index or subscript) of the element within array c | c[ 10 ] : 6453 |
| | c[ 11 ] : 78 |

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# JavaScript Functions

To use parts of scripts several times

Functions are a kind of a template of code

Save time and space

Called when needed

Good and lean structure of the code

JavaScript lets you define functions using the function keyword

Functions can return values using the return keyword

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# Simple User Interaction

There are three built-in methods of doing simple user interaction
   alert(msg) alerts the user that something has happened
   confirm(msg) asks the user to confirm (or cancel) something
   prompt(msg, default) asks the user to enter some text

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# HTML DOM Objects
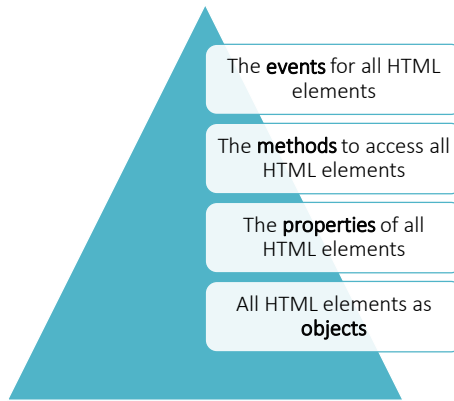
DOM – an acronym for Document Object Model.

It's an interface that provides browser to allow scripts on a webpage to dynamically access and update the content, structure and style of documents

When browser prepares webpage to be shown to user, it constructs tree of objects from all elements of a page according to it's HTML structure

JavaScript code can access the tree and modify it, browser reacts on changes and updates HTML page shown to the user

Changing HTML with JavaScript using DOM interface is also called as Dynamic HTML

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The **events** for all HTML elements

The **methods** to access all HTML elements

The **properties** of all HTML elements

All HTML elements as **objects**

# What DOM Defines?

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# JavaScript Events

JavaScript can be made to respond to user events

Common Events:
onload and onunload : when a page is first visited or left
onfocus, onblur, onchange : events pertaining to form elements
onsubmit : when a form is submitted
onmouseover, onmouseout : for "menu effects"

A complete list of event types is available here
http://www.w3schools.com/jsref/jsref_events.asp

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# Thank You!

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