Table of Contents

Javascript Basics

Including JavaScript in an HTML Page

```
<script type="text/javascript">
  //JS code goes here
</script>
```

Call an External JavaScript File

```
<script src="myscript.js"></script><code></code>
```

Including Comments

```
//
```

Single line comments

```
/* comment here */
```

Multi-line comments

Variables

var, const, let

```
var
```

The most common variable. Can be reassigned but only accessed within a function. Variables defined with var move to the top when code is executed.

```
const
```

Cannot be reassigned and not accessible before they appear within the code.

```
let
```

Similar to const, however, let variable can be reassigned but not re-declared.

Data Types

```
var age = 23
```

Numbers

```
var x
```

Variables

```
var a = "init"
```

Text (strings)

```
var b = 1 + 2 + 3
```

Operations

```
var c = true
```

True or false statements

```
const PI = 3.14
```

Constant numbers

```
var name = {firstName:"John", lastName:"Doe"}
```

Objects

Objects

```
var person = {
  firstName:"John",
  lastName:"Doe",
  age:20,
  nationality:"German"
};
```

Arrays

```
var fruit = ["Banana", "Apple", "Pear"];
```

Array Methods

`concat()`

Join several arrays into one

`indexOf()`

Returns the first position at which a given element appears in an array

`join()`

Combine elements of an array into a single string and return the string

`lastIndexOf()`

Gives the last position at which a given element appears in an array

`pop()`

Removes the last element of an array

`push()`

Add a new element at the end

`reverse()`

Reverse the order of the elements in an array

`shift()`

Remove the first element of an array

`slice()`

Pulls a copy of a portion of an array into a new array

`sort()`

Sorts elements alphabetically

`splice()`

Adds elements in a specified way and position

`toString()`

Converts elements to strings

`unshift()`

Adds a new element to the beginning

`valueOf()`

Returns the primitive value of the specified object

Operators

Basic Operators

```
+     Addition
-     Subtraction
*     Multiplication
/     Division
(..)  Grouping operator
%     Modulus (remainder)
++    Increment numbers
--    Decrement numbers
```

Comparison Operators

```
==    Equal to
===   Equal value and equal type
!=    Not equal
!==   Not equal value or not equal type
>     Greater than
<     Less than
>=    Greater than or equal to
<=    Less than or equal to
?     Ternary operator
```

Logical Operators

```
&&    Logical and
||    Logical or
!     Logical not
```

Bitwise Operators

```
&     AND statement
|     OR statement
~     NOT
^     XOR
<<    Left shift
>>    Right shift
>>>   Zero fill right shift
```

Functions

```
function name(parameter1, parameter2, parameter3) {
  // what the function does
}
```

Outputting Data

`alert()`

Output data in an alert box in the browser window

`confirm()`

Opens up a yes/no dialog and returns true/false depending on user click

`console.log()`

Writes information to the browser console, good for debugging purposes

`document.write()`

Write directly to the HTML document

`prompt()`

Creates an dialogue for user input

Global Functions

`decodeURI()`

Decodes a Uniform Resource Identifier (URI) created by encodeURI or similar

`decodeURIComponent()`

Decodes a URI component

`encodeURI()`

Encodes a URI into UTF-8

`encodeURIComponent()`

Same but for URI components

`eval()`

Evaluates JavaScript code represented as a string

`isFinite()`

Determines whether a passed value is a finite number

`isNaN()`

Determines whether a value is NaN or not

`Number()`

Returns a number converted from its argument

`parseFloat()`

Parses an argument and returns a floating point number

`parseInt()`

Parses its argument and returns an integer

Loops

```
for (before loop; condition for loop; execute after loop) {
  // what to do during the loop
}
for
```

The most common way to create a loop in Javascript

`while`

Sets up conditions under which a loop executes

`do while`

Similar to the while loop, however, it executes at least once and performs a check at the end to see if the condition is met to execute again

`break`

Used to stop and exit the cycle at certain conditions

`continue`

Skip parts of the cycle if certain conditions are met

If - Else Statements

```
if (condition) {
  // what to do if condition is met
} else {
  // what to do if condition is not met
}
```

Strings

```
var person = "John Doe";
```

Escape Characters

```
\'    – Single quote
\"    – Double quote
\\    – Backslash
\b    – Backspace
\f    – Form feed
\n    – New line
\r    – Carriage return
\t    – Horizontal tabulator
```

`\v` — Vertical tabulator

String Methods

`charAt()`

Returns a character at a specified position inside a string

`charCodeAt()`

Gives you the unicode of character at that position

`concat()`

Concatenates (joins) two or more strings into one

`fromCharCode()`

Returns a string created from the specified sequence of UTF-16 code units

`indexOf()`

Provides the position of the first occurrence of a specified text within a string

`lastIndexOf()`

Same as indexOf() but with the last occurrence, searching backwards

`match()`

Retrieves the matches of a string against a search pattern

`replace()`

Find and replace specific text in a string

`search()`

Executes a search for a matching text and returns its position

`slice()`

Extracts a section of a string and returns it as a new string

`split()`

Splits a string object into an array of strings at a specified position

`substr()`

Similar to slice() but extracts a substring depended on a specified number of characters

`substring()`

Also similar to slice() but can't accept negative indices

`toLowerCase()`

Convert strings to lowercase

`toUpperCase()`

Convert strings to uppercase

`valueOf()`

Returns the primitive value (that has no properties or methods) of a string object

Regular Expressions

Pattern Modifiers

```
e — Evaluate replacement
i — Perform case-insensitive matching
g — Perform global matching
m — Perform multiple line matching
s — Treat strings as single line
x — Allow comments and whitespace in pattern
U — Non Greedy pattern
```

Brackets

```
[abc]      Find any of the characters between the brackets
[^abc]     Find any character not in the brackets
[0-9]      Used to find any digit from 0 to 9
[A-z]      Find any character from uppercase A to lowercase z
(a|b|c)    Find any of the alternatives separated with |
```

Metacharacters

```
.    — Find a single character, except newline or line terminator
\w   — Word character
\W   — Non-word character
\d   — A digit
\D   — A non-digit character
\s   — Whitespace character
\S   — Non-whitespace character
\b   — Find a match at the beginning/end of a word
\B   — A match not at the beginning/end of a word
\0   — NUL character
\n   — A new line character
\f   — Form feed character
\r   — Carriage return character
\t   — Tab character
\v   — Vertical tab character
```

```
\xxx — The character specified by an octal number xxx
\xdd — Character specified by a hexadecimal number dd
\uxxxx — The Unicode character specified by a hexadecimal number xxxx
```

Quantifiers

```
n+    — Matches any string that contains at least one n
n*    — Any string that contains zero or more occurrences of n
n?    — A string that contains zero or one occurrences of n
n{X}  — String that contains a sequence of X n's
n{X,Y} — Strings that contains a sequence of X to Y n's
n{X,} — Matches any string that contains a sequence of at least X n's
n$    — Any string with n at the end of it
^n    — String with n at the beginning of it
?=n   — Any string that is followed by a specific string n
?!n   — String that is not followed by a specific string n
```

Numbers and Math

Number Properties

MAX_VALUE

The maximum numeric value representable in JavaScript

MIN_VALUE

Smallest positive numeric value representable in JavaScript

NaN

The "Not-a-Number" value

NEGATIVE_INFINITY

The negative Infinity value

POSITIVE_INFINITY

Positive Infinity value

Number Methods

toExponential()

Returns a string with a rounded number written as exponential notation

toFixed()

Returns the string of a number with a specified number of decimals

`toPrecision()`

String of a number written with a specified length

`toString()`

Returns a number as a string

`valueOf()`

Returns a number as a number

Math Properties

```
E          Euler's number
LN2        The natural logarithm of 2
LN10       Natural logarithm of 10
LOG2E      Base 2 logarithm of E
LOG10E     Base 10 logarithm of E
PI         The number PI
SQRT1_2    Square root of 1/2
SQRT2      The square root of 2
```

Math Methods

`abs(x)`

Returns the absolute (positive) value of x

`acos(x)`

The arccosine of x, in radians

`asin(x)`

Arcsine of x, in radians

`atan(x)`

The arctangent of x as a numeric value

`atan2(y,x)`

Arctangent of the quotient of its arguments

`ceil(x)`

Value of x rounded up to its nearest integer

`cos(x)`

The cosine of x (x is in radians)

`exp(x)`

Value of Ex

`floor(x)`

The value of x rounded down to its nearest integer

`log(x)`

The natural logarithm (base E) of x

`max(x,y,z,...,n)`

Returns the number with the highest value

`min(x,y,z,...,n)`

Same for the number with the lowest value

`pow(x,y)`

X to the power of y

`random()`

Returns a random number between 0 and 1

`round(x)`

The value of x rounded to its nearest integer

`sin(x)`

The sine of x (x is in radians)

`sqrt(x)`

Square root of x

`tan(x)`

The tangent of an angle

Dealing with Dates

Setting Dates

`Date()`

Creates a new date object with the current date and time

`Date(2017, 5, 21, 3, 23, 10, 0)`

Create a custom date object. The numbers represent year, month, day, hour, minutes, seconds, milliseconds. You can omit anything you want except for year and month.

`Date("2017-06-23")`

Date declaration as a string

Pulling Date and Time Values

`getDate()`

Get the day of the month as a number (1-31)

`getDay()`

The weekday as a number (0-6)

`getFullYear()`

Year as a four digit number (yyyy)

`getHours()`

Get the hour (0-23)

`getMilliseconds()`

The millisecond (0-999)

`getMinutes()`

Get the minute (0-59)

`getMonth()`

Month as a number (0-11)

`getSeconds()`

Get the second (0-59)

`getTime()`

Get the milliseconds since January 1, 1970

`getUTCDate()`

The day (date) of the month in the specified date according to universal time (also available for day, month, fullyear, hours, minutes etc.)

`parse`

Parses a string representation of a date, and returns the number of milliseconds since January 1, 1970

Set Part of a Date

`setDate()`

Set the day as a number (1-31)

`setFullYear()`

Sets the year (optionally month and day)

`setHours()`

Set the hour (0-23)

`setMilliseconds()`

Set milliseconds (0-999)

`setMinutes()`

Sets the minutes (0-59)

`setMonth()`

Set the month (0-11)

`setSeconds()`

Sets the seconds (0-59)

`setTime()`

Set the time (milliseconds since January 1, 1970)

`setUTCDate()`

Sets the day of the month for a specified date according to universal time (also available for day, month, fullyear, hours, minutes etc.)

DOM Node

Node Properties

`attributes`

Returns a live collection of all attributes registered to and element

`baseURI`

Provides the absolute base URL of an HTML element

`childNodes`

Gives a collection of an element's child nodes

`firstChild`

Returns the first child node of an element

`lastChild`

The last child node of an element

`nextSibling`

Gives you the next node at the same node tree level

`nodeName`

Returns the name of a node

`nodeType`

Returns the type of a node

`nodeValue`

Sets or returns the value of a node

`ownerDocument`

The top-level document object for this node

`parentNode`

Returns the parent node of an element

`previousSibling`

Returns the node immediately preceding the current one

`textContent`

Sets or returns the textual content of a node and its descendants

Node Methods

`appendChild()`

Adds a new child node to an element as the last child node

`cloneNode()`

Clones an HTML element

`compareDocumentPosition()`

Compares the document position of two elements

`getFeature()`

Returns an object which implements the APIs of a specified feature

`hasAttributes()`

Returns true if an element has any attributes, otherwise false

`hasChildNodes()`

Returns true if an element has any child nodes, otherwise false

`insertBefore()`

Inserts a new child node before a specified, existing child node

`isDefaultNamespace()`

Returns true if a specified namespaceURI is the default, otherwise false

`isEqualNode()`

Checks if two elements are equal

`isSameNode()`

Checks if two elements are the same node

`isSupported()`

Returns true if a specified feature is supported on the element

`lookupNamespaceURI()`

Returns the namespaceURI associated with a given node

`lookupPrefix()`

Returns a DOMString containing the prefix for a given namespaceURI, if present

`normalize()`

Joins adjacent text nodes and removes empty text nodes in an element

`removeChild()`

Removes a child node from an element

`replaceChild()`

Replaces a child node in an element

Element Methods

`getAttribute()`

Returns the specified attribute value of an element node

`getAttributeNS()`

Returns string value of the attribute with the specified namespace and name

`getAttributeNode()`

Gets the specified attribute node

`getAttributeNodeNS()`

Returns the attribute node for the attribute with the given namespace and name

`getElementsByTagName()`

Provides a collection of all child elements with the specified tag name

`getElementsByTagNameNS()`

Returns a live HTMLCollection of elements with a certain tag name belonging to the given namespace

`hasAttribute()`

Returns true if an element has any attributes, otherwise false

`hasAttributeNS()`

Provides a true/false value indicating whether the current element in a given namespace has the specified attribute

`removeAttribute()`

Removes a specified attribute from an element

`removeAttributeNS()`

Removes the specified attribute from an element within a certain namespace

`removeAttributeNode()`

Takes away a specified attribute node and returns the removed node

`setAttribute()`

Sets or changes the specified attribute to a specified value

`setAttributeNS()`

Adds a new attribute or changes the value of an attribute with the given namespace and name

`setAttributeNode()`

Sets or changes the specified attribute node

`setAttributeNodeNS()`

Adds a new namespaced attribute node to an element

Working with the Browser

Window Properties

closed

Checks whether a window has been closed or not and returns true or false

defaultStatus

Sets or returns the default text in the statusbar of a window

document

Returns the document object for the window

frames

Returns all <iframe> elements in the current window

history

Provides the History object for the window

innerHeight

The inner height of a window's content area

innerWidth

The inner width of the content area

length

Find out the number of <iframe> elements in the window

location

Returns the location object for the window

name

Sets or returns the name of a window

navigator

Returns the Navigator object for the window

opener

Returns a reference to the window that created the window

outerHeight

The outer height of a window, including toolbars/ scrollbars

`outerWidth`

The outer width of a window, including toolbars/ scrollbars

`pageXOffset`

Number of pixels the current document has been scrolled horizontally

`pageYOffset`

Number of pixels the document has been scrolled vertically

`parent`

The parent window of the current window

`screen`

Returns the Screen object for the window

`screenLeft`

The horizontal coordinate of the window (relative to screen)

`screenTop`

The vertical coordinate of the window

`screenX`

Same as screenLeft but needed for some browsers

`screenY`

Same as screenTop but needed for some browsers

`self`

Returns the current window

`status`

Sets or returns the text in the statusbar of a window

`top`

Returns the topmost browser window

Window Methods

`alert()`

Displays an alert box with a message and an OK button

`blur()`

Removes focus from the current window

`clearInterval()`

Clears a timer set with setInterval()

`clearTimeout()`

Clears a timer set with setTimeout()

`close()`

Closes the current window

`confirm()`

Displays a dialogue box with a message and an OK and Cancel button

`focus()`

Sets focus to the current window

`moveBy()`

Moves a window relative to its current position

`moveTo()`

Moves a window to a specified position

`open()`

Opens a new browser window

`print()`

Prints the content of the current window

`prompt()`

Displays a dialogue box that prompts the visitor for input

`resizeBy()`

Resizes the window by the specified number of pixels

`resizeTo()`

Resizes the window to a specified width and height

`scrollBy()`

Scrolls the document by a specified number of pixels

`scrollTo()`

Scrolls the document to specific coordinates

`setInterval()`

Calls a function or evaluates an expression at specified intervals

`setTimeout()`

Calls a function or evaluates an expression after a specified interval

`stop()`

Stops the window from loading

Screen Properties

`availHeight`

Returns the height of the screen (excluding the Windows Taskbar)

`availWidth`

Returns the width of the screen (excluding the Windows Taskbar)

`colorDepth`

Returns the bit depth of the color palette for displaying images

`height`

The total height of the screen

`pixelDepth`

The color resolution of the screen in bits per pixel

`width`

The total width of the screen

Events

Mouse

`onclick`

The event occurs when the user clicks on an element

`oncontextmenu`

User right-clicks on an element to open a context menu

`ondblclick`

The user double-clicks on an element

`onmousedown`

User presses a mouse button over an element

`onmouseenter`

The pointer moves onto an element

`onmouseleave`

Pointer moves out of an element

`onmousemove`

The pointer is moving while it is over an element

`onmouseover`

When the pointer is moved onto an element or one of its children

`onmouseout`

User moves the mouse pointer out of an element or one of its children

`onmouseup`

The user releases a mouse button while over an element

Keyboard

`onkeydown`

When the user is pressing a key down

`onkeypress`

The moment the user starts pressing a key

`onkeyup`

The user releases a key

Frame

`onabort`

The loading of a media is aborted

`onbeforeunload`

Event occurs before the document is about to be unloaded

`onerror`

An error occurs while loading an external file

onhashchange

There have been changes to the anchor part of a URL

onload

When an object has loaded

onpagehide

The user navigates away from a webpage

onpageshow

When the user navigates to a webpage

onresize

The document view is resized

onscroll

An element's scrollbar is being scrolled

onunload

Event occurs when a page has unloaded

Form

onblur

When an element loses focus

onchange

The content of a form element changes (for <input>, <select>and <textarea>)

onfocus

An element gets focus

onfocusin

When an element is about to get focus

onfocusout

The element is about to lose focus

oninput

User input on an element

oninvalid

An element is invalid

onreset

A form is reset

onsearch

The user writes something in a search field (for <input="search">)

onselect

The user selects some text (for <input> and <textarea>)

onsubmit

A form is submitted

Drag

ondrag

An element is dragged

ondragend

The user has finished dragging the element

ondragenter

The dragged element enters a drop target

ondragleave

A dragged element leaves the drop target

ondragover

The dragged element is on top of the drop target

ondragstart

User starts to drag an element

ondrop

Dragged element is dropped on the drop target

Clipboard

oncopy

User copies the content of an element

oncut

The user cuts an element's content

`onpaste`

A user pastes content in an element

Media

`onabort`

Media loading is aborted

`oncanplay`

The browser can start playing media (e.g. a file has buffered enough)

`oncanplaythrough`

When browser can play through media without stopping

`ondurationchange`

The duration of the media changes

`onended`

The media has reached its end

`onerror`

Happens when an error occurs while loading an external file

`onloadeddata`

Media data is loaded

`onloadedmetadata`

Meta Metadata (like dimensions and duration) are loaded

`onloadstart`

Browser starts looking for specified media

`onpause`

Media is paused either by the user or automatically

`onplay`

The media has been started or is no longer paused

`onplaying`

Media is playing after having been paused or stopped for buffering

`onprogress`

Browser is in the process of downloading the media

onratechange

The playing speed of the media changes

onseeked

User is finished moving/skipping to a new position in the media

onseeking

The user starts moving/skipping

onstalled

The browser is trying to load the media but it is not available

onsuspend

Browser is intentionally not loading media

ontimeupdate

The playing position has changed (e.g. because of fast forward)

onvolumechange

Media volume has changed (including mute)

onwaiting

Media paused but expected to resume (for example, buffering)

Animation

animationend

A CSS animation is complete

animationiteration

CSS animation is repeated

animationstart

CSS animation has started

Other

transitionend

Fired when a CSS transition has completed

onmessage

A message is received through the event source

onoffline

Browser starts to work offline

ononline

The browser starts to work online

onpopstate

When the window's history changes

onshow

A <menu> element is shown as a context menu

onstorage

A Web Storage area is updated

ontoggle

The user opens or closes the <details> element

onwheel

Mouse wheel rolls up or down over an element

ontouchcancel

Screen touch is interrupted

ontouchend

User finger is removed from a touch screen

ontouchmove

A finger is dragged across the screen

ontouchstart

Finger is placed on touch screen

Errors

try

Lets you define a block of code to test for errors

catch

Set up a block of code to execute in case of an error

throw

Create custom error messages instead of the standard JavaScript errors

finally

Lets you execute code, after try and catch, regardless of the result

Error Name Values

name

Sets or returns the error name

message

Sets or returns an error message in string from

EvalError

An error has occurred in the eval() function

RangeError

A number is “out of range”

ReferenceError

An illegal reference has occurred

SyntaxError

A syntax error has occurred

TypeError

A type error has occurred

URIError

An encodeURI() error has occurred