

To include javascript code on a page, the syntax is –

```
<script type = "text/javascript">
// all the code
</script>
```

To create separate file, use **extension** .js and include the file on the page as –

```
<script src="myjsfile.js"></script>
```

<b>Comments</b> Single-line Multiple-line	There are two types of comments: // this is a single line comment /* this is a multiple line comment when you have to write a lot of things */
<b>Variables</b> – values that hold data to perform calculations or other operations	<ul style="list-style-type: none"> <li>• var – most widely used. can be accessed within the function where declared. can be reassigned.</li> <li>• const – constant value i.e. cannot be reassigned</li> <li>• let – can be used only within the block its declared, can be reassigned</li> </ul>
<b>Data types</b>	<p>Can be of different types –</p> <ul style="list-style-type: none"> <li>• Number, eg. var id = 20</li> <li>• Unassigned variable, eg. var x</li> <li>• String, eg. var company = "hackr"</li> <li>• Boolean, eg. var windowopen = true</li> <li>• Constants. eg. const counter = 1</li> <li>• Operations, eg. var sum = 20 + 20</li> <li>• Objects, eg. var student =</li> </ul>
<b>Objects</b>	Contains single object of various data types – Eg, var student = ;

## Arrays

Arrays group similar kinds of data together. Eg, var subjectlist = ["math", "science", "history", "computer"]; Arrays can perform the following functions:

Functions	Description
concat()	Concatenate different arrays into one.
join()	Joins all the elements of one array as a string
indexOf()	Returns the index (first position) of an element in the array
lastindexOf()	Returns the last position of an element in the array
sort()	Alphabetic sort of array elements

reverse()	Sort elements in descending order
valueOf()	Primitive value of the element specified
slice()	Cut a portion of one array and put it in a new array
splice()	Add elements to an array in a specific manner and position
unshift()	Add new element to the array in the beginning
shift()	Remove first element of the array
pop()	Remove the last element of the array
push()	Add new element to the array as the last one
toString()	Prints the string value of the elements of the array

## Operators

<b>Basic</b>	<ul style="list-style-type: none"> <li>• Addition (+)</li> <li>• Subtraction (-)</li> <li>• Multiply (*)</li> <li>• Divide (/)</li> <li>• Remainder (%)</li> <li>• Increment (++)</li> <li>• Decrement (--)</li> <li>• Execute brackets first (...)</li> </ul>
<b>Logical</b>	<ul style="list-style-type: none"> <li>• And (&amp;&amp;)</li> <li>• Or (  )</li> <li>• Not (!)</li> </ul>
<b>Comparison</b>	<ul style="list-style-type: none"> <li>• Equal to (==)</li> <li>• Equal value and type (===)</li> <li>• Not equal (!=)</li> <li>• Not equal value or type (!==)</li> <li>• Greater than (&gt;)</li> <li>• Less than (&lt;)</li> <li>• Greater than or equal to (&gt;=)</li> <li>• Less than or equal to (&lt;=)</li> <li>• Ternary operator (?)</li> </ul>
<b>Bitwise</b>	<ul style="list-style-type: none"> <li>• AND (&amp;)</li> <li>• OR ( )</li> <li>• NOT (~)</li> <li>• XOR (^)</li> <li>• Left shift (&lt;&lt;)</li> <li>• Right shift (&gt;&gt;)</li> <li>• Zero fill right shift (&gt;&gt;&gt;)</li> </ul>

## Function

A group of tasks can be performed in a single function. Eg,

```
function add(a, b){// code}
```

### Outputting the Data

alert()	Show some output in a small pop up window (alert box)
document.write()	Write output to the html document
console.log()	Mainly used for debugging, write output on the browser console
prompt()	Prompt for user input using dialog box
confirm()	Open dialog with yes/no and return true/false based on user click

### Global Functions

encodeURIComponent()	Encodes a URI into UTF-8	<pre>var uri = "hackr.io/blog"; var enc = encodeURIComponent(uri);</pre>
encodeURIComponent()	Encoding for URI components	<pre>var uri = "hackr.io/blog"; var enccomp = encodeURIComponent(uri);</pre>
decodeURI()	Decodes a <a href="#">Uniform Resource Identifier (URI)</a> created by encodeURIComponent or similar	<pre>var dec = decodeURI(enc);</pre>
decodeURIComponent()	Decodes a URI component	<pre>var decomp = decodeURIComponent(enccomp);</pre>
parseInt()	Parses the input returns an integer	<pre>var a = parseInt("2003 monday");</pre>

parseFloat()	Parses the input and returns a floating-point number	<pre>var b = parseFloat("23.333");</pre>
eval()	Evaluates JavaScript code represented as a string	<pre>var x = eval("2 * 2");</pre>
Number()	Returns a number converted from its initial value	<pre>var y = new Date(); var z = Number(y);</pre>
isNaN()	Determines whether a value is NaN or not	<pre>isNaN(25);</pre>
isFinite()	Determines whether a passed value is a finite number	<pre>isFinite(-245);</pre>

## Loops

for	looping in javascript	<pre>var i; for (i = 0; i &lt; 5; i++) { // code}</pre>
while	execute a block of code while some condition is true	<pre>while (product.length &gt; 5) {// some code}</pre>
do... while	similar to while, but executes at least as the condition is applied after the code is executed	<pre>do { // code }while (condition){ }</pre>
break	break and exit the cycle based on some conditions	<pre>if (i &lt;10) break;</pre>

continue	continue next iteration if some conditions are met	<pre>if (j&gt;10)   continue;</pre>
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## if-else statements

if-else lets you set various conditions –

```
if (condition 1)
{
  //execute this code
} else if (condition 2)
{
  // execute new code
} else
{
  // execute if no other condition is true
}
```

## String Methods

Method	Meaning	Example
length	determines length of string	<pre>var a = "hackr.io"; a.length;</pre>
indexOf()	finds position of the first occurrence of a character or text in the string	<pre>var a = "hackr.io is nice we bsite"; var b = a.indexOf("nice");</pre>
lastIndexOf()	returns last occurrence of text in a string	<pre>var a = "hackr.io is nice we bsite"; var b = a.indexOf("nice", 6) ;</pre>
search()	searches and returns position of a specified value in string	<pre>var a = "hackr.io is nice website"; var b = a.search("nice");</pre>
slice()	extracts and returns part of a string as another new string	<pre>var a = "hackr.io is nice we bsite";</pre>

		<pre>var b = a.slice(13); will return nice website.</pre>
<code>substring()</code>	substring returns part of the string from start index to the end index specified. cannot take negative values unlike slice()	<pre>var a = "hackr.io is nice website"; var b = a.substring(0, 7);</pre>
<code>substr()</code>	returns the sliced out portion of a string, the second parameter being the length of the final string.	<pre>var a = "hackr.io is nice website"; var b = a.substr(13, 8);</pre>
<code>replace()</code>	replaces a particular value with another	<pre>var a = "hackr.io is nice website"; var b = a.replace("nice", "good");</pre>
<code>touppercase()</code>	changes all characters into uppercase	<pre>var a = "hackr.io is nice website"; var b = a.touppercase (a);</pre>
<code>tolowercase()</code>	changes all characters into lowercase	<pre>var a = "hackr.io is nice website"; var b = a.toLowerCase(a);</pre>
<code>concat()</code>	joins two or more strings together into another string	<pre>var a = "my name is"; var b = "john"; var c = a.concat(": ", b);</pre>
<code>trim()</code>	removes white spaces from a string	<pre>var a = "      hi, there!"; a.trim();</pre>
<code>charAt()</code>	finds character at a specified position	<pre>var a = "hackr.io";</pre>

		a.charAt(1) will return a
charCodeAt()	returns the unicode of character at the specified position	<pre>“hackr”.charCodeAt(0);</pre> <p>will return 72</p>
split()	convert a string into array based on special character	<pre>var a = “hackr.io”; var arr = a.split(“”);</pre> <p>will return an array of characters h,a,c,k,r and so on..</p>
accessing characters using []	access a character of string using its index (doesn't work on some versions of ie)	<pre>var a = “hackr.io”; a[2] will return c</pre>

## Escape characters

\'	Single quote
\"	Double quote
\\	Single backslash
\b	Backspace
\f	Form feed
\n	New line
\t	Horizontal tab
\v	Vertical tab
\r	Carriage return

## Regular Expressions

Regular expressions can be in the form of pattern modifiers, metacharacters, quantifiers and brackets. **Pattern modifiers**

e	evaluate replacement
i	case-insensitive matching

g	global matching – find all matches
m	multiple line matching
s	treat strings as a single line
x	allow comments and whitespace in the pattern
u	ungreedy pattern

## Brackets

[abc]	Find any of the characters between the brackets
[^abc]	Find any character which are 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	NULL character
\n	A new line character
\f	Form feed character



<code>\r</code>	Carriage return character
<code>\t</code>	Tab character
<code>\v</code>	Vertical tab character
<code>\xxx</code>	The character specified by an octal number xxx
<code>\xdd</code>	Character specified by a hexadecimal number dd
<code>\uxxxx</code>	The Unicode character specified by a hexadecimal number xxxx

## Quantifiers

<code>n+</code>	Matches string that contains at least one 'n'
<code>n*</code>	Any string containing zero or more occurrences of n
<code>n?</code>	A string that has no or one occurrence of n
<code>n</code>	String that contains a sequence of X n's
<code>n</code>	Strings that contain a sequence of X to Y n's
<code>n</code>	Matches string that has a sequence of at least X n's
<code>n\$</code>	Any string with n at the end of it
<code>^n</code>	String with n at the beginning of it
<code>?=n</code>	Any string that is followed by the string n
<code>?!n</code>	String that is not followed by the string n

## Numbers

<b>Number properties</b>	<code>MAX_VALUE</code>	The maximum numeric value that can be represented in JavaScript
	<code>MIN_VALUE</code>	Smallest positive numeric value possible in JavaScript
	<code>NaN</code>	Not-a-Number
	<code>NEGATIVE_INFINITY</code>	The negative Infinity value
	<code>POSITIVE_INFINITY</code>	Positive Infinity value

## Number methods

Method	Meaning	Example
toExponential()	Returns the string with a number rounded to and written in exponential form	<pre>var a = 3.1417; a.toExponential(2); will give 3.14e+0</pre>
toFixed()	Returns the string of a number with specific number of decimals	<pre>var a = 3.1417; a.toFixed(2); will return 3.14</pre>
toPrecision()	Returns string to the precision of the specified decimal	<pre>var a = 3.46; a.toPrecision(2); returns 3.5</pre>
valueOf()	Converts number object to primitive type	<pre>var x = 23; x.valueOf();</pre>

<b>Math properties</b>	E	Euler's number
	LN2	The natural logarithm with base 2
	LN10	Natural logarithm with base 10
	LOG2E	Base 2 logarithm of E
	LOG10E	Base 10 logarithm of E
	PI	The number PI (3.14...)
	SQRT1_2	Square root of 1/2
	SQRT2	Square root of 2

<b>Math methods</b>	<i>All angle values are in radian</i>	
	abs(x)	Returns the absolute (positive) value of x
	acos(x)	The arccosine of x
	asin(x)	Arcsine of x

atan(x)	The arctangent of x (numeric)
atan2(y,x)	Arctangent of the quotient of its arguments
sin(x)	The sine of x
cos(x)	The cosine of x
tan(x)	The tangent of an angle
exp(x)	Value of $E^x$
ceil(x)	Value of x rounded up to its nearest integer
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
round(x)	The value of x rounded to its nearest integer
sqrt(x)	Square root of x
random()	Returns a random number between 0 and 1

## Dates

Date()	Creates a new date object with current date and time
Date(2019, 10, 21, 12, 24, 58, 13)	Create a custom date object. Format – (yyyy, mm, dd, hh, min, s, ms). Except for year and month, all parameters are optional.
Date("2019-10-21")	Date declaration as a string
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()	Get 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, full year, hours, minutes etc.)
parse	Parses a string representation of a date and returns the number
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, full year, hours, minutes etc.)

## DOM mode

**Document Object Model**) is the code of the page structure. HTML elements (called as nodes) can be easily manipulated using JavaScript.

<b>Node properties</b>	attributes	Returns all attributes registered to an element
	baseURI	Provides the absolute base URL of an HTML element
	nodeName	the name of a node
	nodeType	type of a node
	nodeValue	sets or gets value of a node
	parentNode	parent node of an element
	childNodes	all child nodes of an element
	firstChild	first child node of an element
	lastChild	last child node of an element
	ownerDocument	top-level document object for this (current) node

<b>Node methods</b>	previousSibling	node immediately preceding the current one
	nextSibling	next node in the same node tree level
	textContent	Sets or returns the textual content of a node and its descendants
	cloneNode()	Clones an HTML element
	compareDocumentPosition()	Compares the document position of two elements
	isDefaultNamespace()	Returns true if the specified namespaceURI is the default
	lookupNamespaceURI()	Returns the namespace URI associated with the given node
	getFeature()	Returns an object which implements the APIs of a specified feature
	isSupported()	Returns true if a specified feature is supported on the element
	hasAttributes()	Returns true if an element has any attributes
	insertBefore()	Inserts a new child node before a specified, existing child node
	isEqualNode()	Checks if two elements are equal
	isSameNode()	Checks if two elements are the same node
	hasChildNodes()	Returns true if an element has any child nodes
	lookupPrefix()	Returns a DOMString containing the prefix for a given namespace URI, 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
	appendChild()	Adds a new child node to an element as the last child node

**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 node for the attribute with the given namespace and name
getElementsByTagName()	Provides a collection of all child elements within the specified tag name
getElementsByTagNameNS()	Returns HTML elements with particular tag name with 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
setAttribute()	Sets or changes the specified attribute to the specified value
setAttributeNS()	Adds a new attribute or changes the value of an existing attribute with the given namespace and name
setAttributeNode()	Sets or modifies the specified attribute node
setAttributeNodeNS()	Adds a new name spaced attribute node to an element
removeAttribute()	Removes a specified attribute from an element
removeAttributeNS()	Removes and returns the specified attribute node within a certain namespace
removeAttributeNode()	Removes and returns the specified attribute node

## Browser actions

<b>Window properties</b>	closed	Checks if a window has been closed
	defaultStatus	Sets or gets the default text in the windows status bar
	self	the current window
	top	topmost browser window
	parent	parent window of the current window
	document	Returns the window document object
	frames	Returns all <iframe> elements in the current window
	history	History object for the window
	innerHeight	The inner height of window's content area
	innerWidth	The inner width of content area
	length	number of <iframe> elements in the window
	location	location object for the window
	name	Sets or gets the window name
	navigator	Returns the Navigator object for the window
	opener	reference to the window that created the window
	outerHeight	outer height of a window, including toolbars/scrollbars
	outerWidth	outer width of a window, including toolbars/scrollbars
	pageXOffset	Number of pixels the current document has been scrolled horizontally
	pageYOffset	Number of pixels the current document has been scrolled vertically
	screen	Returns the Screen object for the window
	screenLeft	The horizontal coordinate of the window
	screenTop	The vertical coordinate of the window
	screenX	Same function as screenLeft (for some browsers)
	screenY	Same function as screenTop (for some browsers)
	status	Sets or gets the text in the status bar of a window

**Window  
methods**

alert()	Displays an alert box with a message and an OK button
blur()	Removes focus from the current window
clearTimeout()	Clears a timer set with setTimeout()
clearInterval()	Clears a timer set with setInterval()
close()	Closes the current window
open()	Opens a new browser window
stop()	Stops the window from loading
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
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 specified coordinates
setInterval()	Calls a function or evaluates an expression at specified intervals
setTimeout()	Calls a function or evaluates an expression after a specified interval



<b>Screen properties</b>	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

## User Events

### 1. Mouse

onclick	event that happens when user clicks on an element
onmouseover	when the mouse is moved over some element or its children
onmouseout	User moves the mouse pointer out of an element or one of its children
onmouseup	when user releases a mouse button while over an element
onmousedown	when user presses a mouse button over an element
onmouseenter	pointer moves onto an element
onmouseleave	Pointer moves out of an element
onmousemove	pointer is moving when it is over an element
oncontextmenu	User right-clicks on an element to open a context menu
ondblclick	The user double-clicks on an element

### 2. 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

### 3. Frame

onabort	The loading of a media is aborted
onbeforeunload	Event that occurs before a document is to be unloaded
onunload	Event occurs when a page has unloaded

onerror	When 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	the user navigates to a webpage
onresize	The document view is resized
onscroll	An element's scrollbar is being scrolled

#### 4. Form

onblur	When an element loses focus
onchange	when content of a form element like <code>&lt;input&gt;</code> , <code>&lt;select&gt;</code> and <code>&lt;textarea&gt;</code> changes
onfocus	An element gets focus
onfocusin	When an element is about to get focus
onfocusout	When element is about to lose focus
oninput	User input on an element
oninvalid	An element is invalid
onreset	form reset
onsearch	The user writes something in the input type search
onselect	The user selects some text ( <code>&lt;input&gt;</code> and <code>&lt;textarea&gt;</code> )
onsubmit	event that happens upon submitting the form

#### 5. Drag

ondrag	An element is dragged
ondrop	Dragged element is dropped on the drop target
ondragstart	User starts to drag an element
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

## 6. Clipboard

oncut	event that happens when user cuts content of an element
oncopy	event that happens when user copies content of an element
onpaste	event that happens when user pastes content of an element

## 7. Media

onabort	Media loading is aborted
onended	The media ended
onerror	Happens when an error occurs while loading an external file
oncanplay	The browser can start playing media
oncanplaythrough	The browser can play through media without stopping
ondurationchange	change in the duration of the media
onloadeddata	Media data loaded
onloadedmetadata	Metadata (e.g. dimensions, duration) are loaded
onloadstart	The browser starts looking for specified media
onpause	Media is paused either by the user or automatically
onplay	The media started to play or is no longer paused
onplaying	Media is playing after being paused or stopped for buffering
onprogress	The 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 unavailable
onwaiting	Media paused but expected to resume (like in buffering)
onsuspend	The browser is intentionally not loading media
ontimeupdate	The playing position has changed (like in case of fast forward)
onvolumechange	Media volume has increased or reduced

## 8. Animation

animationstart	CSS animation started
animationend	CSS animation ended
animationiteration	CSS animation plays over

## 9. Other

transitionend	event triggered when a CSS transition has completed
onmessage	A message is received through the event source
ononline	The browser starts to work online
onoffline	The browser starts to work offline
ontoggle	The user opens or closes the <details> element
onpopstate	When the window's history changes
onshow	A <menu> element is shown as a context menu
onstorage	A Web Storage area is updated
onwheel	Mouse wheel rolls up or down over an element
ontouchstart	A finger is placed on the touch-screen
ontouchend	User's finger is removed from a touch-screen
ontouchcancel	Screen-touch is interrupted
ontouchmove	User finger is dragged across the screen

## 10. Errors

try	block of code to execute in case of no errors
catch	block of code to execute in case of an error
throw	Create custom error messages rather than standard JavaScript errors
finally	block that is always executed whether there is error in execution or not

## Error-values

Each error has a name and message property that define it.

- **name:** Sets or gets the error name
- **message:** Sets or gets error in an understandable string format

EvalError	error occurred in the eval() function
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## JAVASCRIPT

RangeError	number out of range
ReferenceError	illegal reference occurred
SyntaxError	syntax error
TypeError	type error
URIError	encodeURIComponent() error