



## Basics ▾

### Loops ↴

#### For Loop

```
for (var i = 0; i < 10; i++) {
    document.write(i + ":" + i*3 + "<br />");
}
var sum = 0;
for (var i = 0; i < a.length; i++) {
    sum += a[i];
}                                // parsing an array
html = "";
for (var i of custOrder) {
    html += "<li>" + i + "</li>";
}
```

#### While Loop

```
var i = 1;                      // initialize
while (i < 100) {               // enters the cycle
    i *= 2;                     // increment to avoid
    document.write(i + ", ");    // output
}
```

#### Do While Loop

```
var i = 1;                      // initialize
do {                           // enters cycle at
    i *= 2;                     // increment to avoid
    document.write(i + ", ");    // output
} while (i < 100)              // repeats cycle if
```

#### Break

```
for (var i = 0; i < 10; i++) {
    if (i == 5) { break; }       // stops and exits
    document.write(i + ", ");    // last output
}
```

#### Continue

```
for (var i = 0; i < 10; i++) {
    if (i == 5) { continue; }    // skips the rest
    document.write(i + ", ");    // skips 5
}
```

### Variables x

```
var a;                          // variable
var b = "init";                 // string
var c = "Hi" + " " + "Joe";     // = "Hi Joe"
var d = 1 + 2 + "3";            // = "33"
var e = [2,3,5,8];              // array
var f = false;                  // boolean
var g = /()/.test("");          // RegEx
var h = function(){};            // function object
const PI = 3.14;                 // constant
var a = 1, b = 2, c = a + b;     // one line
let z = 'zzz';                  // block scope local
```

#### Strict mode

```
"use strict"; // Use strict mode to write secure
x = 1;        // Throws an error because variable
```

#### On page script

```
<script type="text/javascript"> ...
</script>
```

#### Include external JS file

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

#### Delay - 1 second timeout

```
setTimeout(function () {
}, 1000);
```

#### Functions

```
function addNumbers(a, b) {
    return a + b;
}
x = addNumbers(1, 2);
```

#### Edit DOM element

```
document.getElementById("elementID").innerHTML =
```

#### Output

<code>console.log(a);</code>	// write to the browser
<code>document.write(a);</code>	// write to the HTML
<code>alert(a);</code>	// output in an alert
<code>confirm("Really?");</code>	// yes/no dialog, returns true/false
<code>prompt("Your age?", "0");</code>	// input dialog. Returns user input

#### Comments

```
/* Multi line
   comment */
// One line
```

## If - Else ↴

```
if ((age >= 14) && (age < 19)) {           // logical operator
    status = "Eligible.";                    // executes
} else {                                       // else branch
    status = "Not eligible.";                // executes
}
```

#### Switch Statement

```
switch (new Date().getDay()) {           // input is current day
    case 6:                            // if (day == 6)
        text = "Saturday";             // executes
        break;
    case 0:                            // if (day == 0)
        text = "Sunday";              // executes
        break;
    default:                          // else...
        text = "Whatever";           // executes
}
```

## Data Types ☰

<code>var age = 18;</code>	// number
<code>var name = "Jane";</code>	// string

## Values

```
false, true          // boolean
18, 3.14, 0b10011, 0xF6, NaN // number
"flower", 'John'      // string
undefined, null , Infinity // special
```

## Operators

```
a = b + c - d;      // addition, subtraction
a = b * (c / d);    // multiplication, division
x = 100 % 48;        // modulo. 100 / 48 remainder =
a++; b--;            // postfix increment and decrement
```

## Bitwise operators

&	AND	5 & 1 (0101 & 0001)	1 (1)
	OR	5   1 (0101   0001)	5 (101)
~	NOT	~ 5 (~0101)	10 (1010)
^	XOR	5 ^ 1 (0101 ^ 0001)	4 (100)
<<	left shift	5 << 1 (0101 << 1)	10 (1010)
>>	right shift	5 >> 1 (0101 >> 1)	2 (10)
>>>	zero fill right shift	5 >>> 1 (0101 >>> 1)	2 (10)

## Arithmetic

```
a * (b + c)          // grouping
person.age             // member
person[age]            // member
!(a == b)              // logical not
a != b                // not equal
typeof a               // type (number, object, function)
x << 2 x >> 3         // binary shifting
a = b                 // assignment
a == b                // equals
a != b                // unequal
a === b               // strict equal
a !== b               // strict unequal
a < b a > b           // less and greater than
a <= b a >= b         // less or equal, greater or equal
a += b                // a = a + b (works with - * %)
a && b                // logical and
a || b                // logical or
```

## Numbers and Math

```
var pi = 3.141;
pi.toFixed(0);          // returns 3
pi.toFixed(2);          // returns 3.14 - for working with numbers
pi.toPrecision(2);       // returns 3.1
pi.valueOf();           // returns number
Number(true);           // converts to number
Number(new Date());     // number of milliseconds since epoch
parseInt("3 months");  // returns the first number
parseFloat("3.5 days"); // returns 3.5
Number.MAX_VALUE         // largest possible JS number
Number.MIN_VALUE         // smallest possible JS number
Number.NEGATIVE_INFINITY // -Infinity
Number.POSITIVE_INFINITY // Infinity
```

## Math.

```
var pi = Math.PI;        // 3.141592653589793
Math.round(4.4);          // = 4 - rounded
Math.round(4.5);          // = 5
Math.pow(2,8);            // = 256 - 2 to the power of 8
Math.sqrt(49);            // = 7 - square root
Math.abs(-3.14);          // = 3.14 - absolute, positive
Math.ceil(3.14);          // = 4 - rounded up
Math.floor(3.99);         // = 3 - rounded down
Math.sin(0);              // = 0 - sine
```

```
var name = {first:"Jane", last:"Doe"}; // object
var truth = false;                      // boolean
var sheets = ["HTML", "CSS", "JS"];      // array
var a; typeof a;                         // undefined
var a = null;                           // value null
```

## Objects

```
var student = {                     // object name
  firstName:"Jane",                // list of properties
  lastName:"Doe",
  age:18,
  height:170,
  fullName : function() {          // object function
    return this.firstName + " " + this.lastName
  }
};
student.age = 19;                  // setting value
student[age]++;                  // incrementing
name = student.fullName();        // call object function
```

## Strings

```
var abc = "abcdefghijklmnopqrstuvwxyz";
var esc = 'I don\'t \n know'; // \n new line
var len = abc.length;         // string length
abc.indexOf("lmno");         // find substring
abc.lastIndexOf("lmno");     // last occurrence
abc.slice(3, 6);             // cuts out "def"
abc.replace("abc","123");     // find and replace
abc.toUpperCase();            // convert to uppercase
abc.toLowerCase();            // convert to lowercase
abc.concat(" ", str2);       // abc + " " + str2
abc.charAt(2);                // character at index
abc[2];                      // unsafe, abc[2]
abc.charCodeAt(2);            // character code
abc.split(",");              // splitting a string
abc.split("");                // splitting on character
128.toString(16);            // number to hex()
```

## Events

```
<button onClick="myFunction();">
  Click here
</button>
```

### Mouse

onclick, oncontextmenu, ondblclick, onmousedown, onmouseenter, onmouseleave, onmousemove, onmouseover, onmouseout, onmouseup

### Keyboard

onkeydown, onkeypress, onkeyup

### Frame

onabort, onbeforeunload, onerror, onhashchange, onload, onpageshow, onpagehide, onresize, onscroll, onunload

### Form

onblur, onchange, onfocus, onfocusin, onfocusout, oninput, oninvalid, onreset, onsearch, onselect, onsubmit

### Drag

ondrag, ondragend, ondragenter, ondragleave, ondragover, ondragstart, ondrop

### Clipboard

oncopy, oncut, onpaste

```

Math.cos(Math.PI);           // OTHERS: tan, atan, asin, ac
Math.min(0, 3, -2, 2);      // = -2 - the lowest value
Math.max(0, 3, -2, 2);      // = 3 - the highest value
Math.log(1);                // = 0 natural logarithm
Math.exp(1);                // = 2.7182pow(E,x)
Math.random();               // random number between 0
Math.floor(Math.random() * 5) + 1; // random integ

```

#### Constants like Math.PI:

E, PI, SQRT2, SQRT1\_2, LN2, LN10, LOG2E, Log10E

## Dates [31]

Mon Feb 17 2020 13:42:03 GMT+0200 (Eastern European Standard Time)

```

var d = new Date();
1581939723047 milliseconds passed since 1970
Number(d)

Date("2017-06-23");          // date declaration
Date("2017");                // is set to Jan
Date("2017-06-23T12:00:00-09:45"); // date - time
Date("June 23 2017");        // long date format
Date("Jun 23 2017 07:45:00 GMT+0100 (Tokyo Time)");

```

#### Get Times

```

var d = new Date();
a = d.getDay();             // getting the weekday

getDate();                  // day as a number (1-31)
getDay();                   // weekday as a number (0-6)
getFullYear();              // four digit year (yyyy)
getHours();                 // hour (0-23)
getMilliseconds();          // milliseconds (0-999)
getMinutes();               // minutes (0-59)
getMonth();                 // month (0-11)
getSeconds();               // seconds (0-59)
getTime();                  // milliseconds since 1970

```

#### Setting part of a date

```

var d = new Date();
d.setDate(d.getDate() + 7); // adds a week to a date

 setDate();                 // day as a number (1-31)
setFullYear();              // year (optionally month and day)
setHours();                 // hour (0-23)
setMilliseconds();          // milliseconds (0-999)
setMinutes();               // minutes (0-59)
setMonth();                 // month (0-11)
setSeconds();               // seconds (0-59)
setTime();                  // milliseconds since 1970

```

## Global Functions ()

```

eval();                      // executes a string as code
String(23);                  // return string from number
(23).toString();             // return string from number
Number("23");                // return number from string
decodeURI(enc);              // decode URI. Result: string
encodeURI(uri);              // encode URI. Result: string
decodeURIComponent(enc);     // decode a URI component
encodeURIComponent(uri);    // encode a URI component
isFinite();                  // is variable a finite number
isNaN();                     // is variable an illegal value
parseFloat();                // returns floating point number
parseInt();                  // parses a string and returns integer

```

## Media

onabort, oncanplay, oncanplaythrough, ondurationchange, onended, onerror, onloadeddata, onloadedmetadata, onloadstart, onpause, onplay, onplaying, onprogress, onratechange, onseeked, onseeking, onstalled, onsuspend, ontimeupdate, onvolumechange, onwaiting

## Animation

animationend, animationiteration, animationstart

## Miscellaneous

transitionend, onmessage, onmousewheel, ononline, onoffline, onpopstate, onshow, onstorage, ontoggle, onwheel, ontouchcancel, ontouchend, ontouchmove, ontouchstart

## Arrays ≡

```

var dogs = ["Bulldog", "Beagle", "Labrador"];
var dogs = new Array("Bulldog", "Beagle", "Labrador");

alert(dogs[1]);           // access value at index 1
dogs[0] = "Bull Terrier"; // change the first item

for (var i = 0; i < dogs.length; i++) { // loop through array
  console.log(dogs[i]);
}

```

#### Methods

```

dogs.toString();           // convert array to string
dogs.join(" * ");          // join: concatenates all elements
dogs.pop();                // remove last element
dogs.push("Chihuahua");   // add new element
dogs[dogs.length] = "Chihuahua"; // the same as push
dogs.shift();              // remove first element
dogs.unshift("Chihuahua"); // add new element at start
delete dogs[0];            // change element
dogs.splice(2, 0, "Pug", "Boxer"); // add elements
var animals = dogs.concat(cats,birds); // join two arrays
dogs.slice(1,4);           // elements from index 1 to 4
dogs.sort();                // sort升序
dogs.reverse();             // sort降序
x.sort(function(a, b){return a - b}); // numerical sort
x.sort(function(a, b){return b - a}); // numerical sort
highest = x[0];             // first element
x.sort(function(a, b){return 0.5 - Math.random()}) // random sort

```

concat, copyWithin, every, fill, filter, find, findIndex, forEach, indexOf, isArray, join, lastIndexOf, map, pop, push, reduce, reduceRight, reverse, shift, slice, some, sort, splice, toString, unshift, valueOf

## Regular Expressions \n

```
var a = str.search(/CheatSheet/i);
```

#### Modifiers

i	perform case-insensitive matching
g	perform a global match
m	perform multiline matching

#### Patterns

\	Escape character
\d	find a digit
\s	find a whitespace character
\b	find match at beginning or end of a word

## Errors

```
try {                                // block of code to
    undefinedFunction();
}
catch(err) {                           // block to handle
    console.log(err.message);
}

Throw error
throw "My error message";      // throw a text

Input validation
var x = document.getElementById("mynum").value; //
try {
    if(x == "")   throw "empty";           //
    if(isNaN(x)) throw "not a number";
    x = Number(x);
    if(x > 10)   throw "too high";
}
catch(err) {
    document.write("Input is " + err);    //
    console.error(err);
}
finally {
    document.write("</br>Done");          //
}
```

### Error name values

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

## Useful Links ↵

JS cleaner	Obfuscator
Can I use?	Node.js
jQuery	RegEx tester

n+ contains at least one n  
n\* contains zero or more occurrences of n  
n? contains zero or one occurrences of n  
^ Start of string

## JSON j

```
var str = '{"names":[' +                                // cr
  '{"first":"Hakuna","lastN":"Matata" },' +
  '{"first":"Jane","lastN":"Doe" },' +
  '{"first":"Air","last":"Jordan" }]' +';';
obj = JSON.parse(str);                                // pa
document.write(obj.names[1].first);                  // ac
```

### Send

```
var myObj = { "name":"Jane", "age":18, "city":"Chicago" };
var myJSON = JSON.stringify(myObj);
window.location = "demo.php?x=" + myJSON;
```

### Storing and retrieving

```
myObj = { "name":"Jane", "age":18, "city":"Chicago" };
myJSON = JSON.stringify(myObj);
localStorage.setItem("testJSON", myJSON);
text = localStorage.getItem("testJSON");
obj = JSON.parse(text);
document.write(obj.name);
```

## Promises ↵

```
function sum (a, b) {
    return Promise(function (resolve, reject) {
        setTimeout(function () {
            if (typeof a !== "number" || typeof b !== "number")
                return reject(new TypeError("Inputs must be numbers"));
            resolve(a + b);
        }, 1000);
    });
}
var myPromise = sum(10, 5);
myPromise.then(function (result) {
    document.write(" 10 + 5: ", result);
    return sum(null, "foo");                                // Invalid
}).then(function () {                                       // Won't run
}).catch(function (err) {                                    // The catch block
    console.error(err);                                     // => Please
});
```

### States

pending, fulfilled, rejected

### Properties

Promise.length, Promise.prototype

### Methods

Promise.all(iterable), Promise.race(iterable),  
Promise.reject(reason), Promise.resolve(value)