Web Engineering Front-end Pt. 3

9. JavaScript: Methods

Revision

Knowledge
DECT
Tools
Skills

Objects

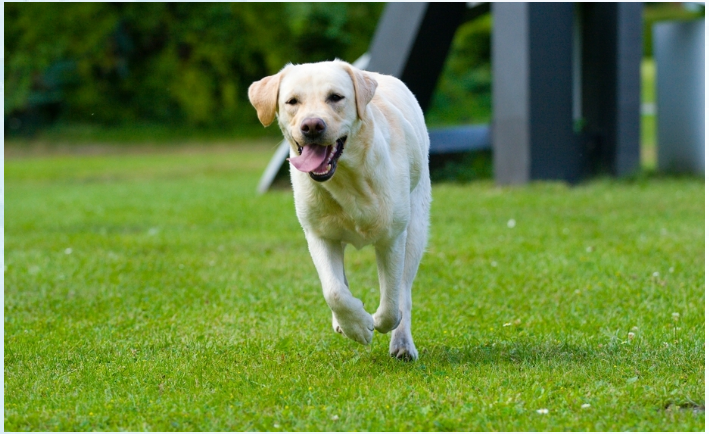
Almost everything in JavaScript is an object (strings, numbers Booleans etc.)

Objects

Objects are made of properties and methods.

Properties are values that are associated with an object.

Revision: Dog object



Properties:

- name: Marley
- gender: Male
- age: 2
- breed: Labrador retriever

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2. Math Object
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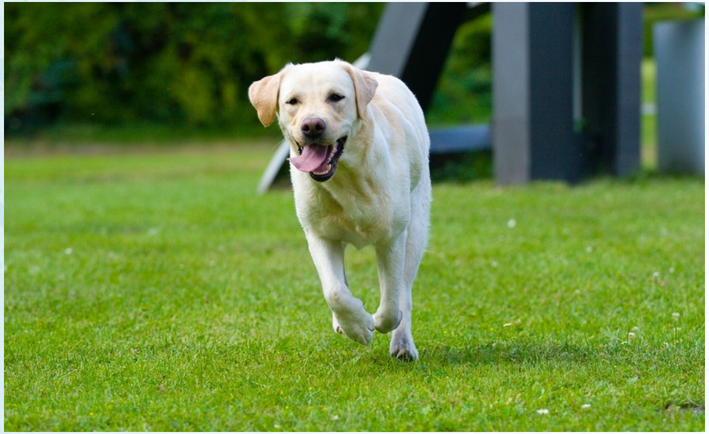
9.1 What are methods?

What are methods?

Methods are actions that can performed on an object.

Dog object method



Properties:

- name: Marley
- gender: Male
- age: 2
- breed: Labrador retriever

Methods (actions):

- bark()
- fetch()
- rollOver()

Accessing object methods

To make the dog bark, we would call the function with dog.bark().

```
dog.bark();
// “Woof!”
```

Activity: Real-life methods

Can you think of some methods that things in your classroom would have if they were JavaScript objects?

Built-in methods

You should already be familiar with some built-in JavaScript functions.

e.g.

typeof(), String(), Number(), Boolean(), charAt() ...

Built-in methods

In the following chapters, we will be going through some more object types and some of their built-in methods.

9.2 Math Object

Math object

- The Math object allows us to perform complex math on numbers.
- It is special in that it has no constructor, and its properties and methods can be used without first creating it.

Math constants

Property	Description	Approximate value
Math.LN2	log2	0.693
Math.LN10	log10	2.303
Math.PI	pi	3.14159
Math.SQRT2	Square root of 2	1.414
Math.SQRT1_2	Square root of 1/2	0.707
Math.E	Euler’s constant	2.718

Math functions

Method	Description	Example
Math.abs(x)	Returns the absolute value of x	Math.abs(2-4); // 2
Math.sqrt(x)	Returns the square root of x	Math.sqrt(36); // 6
Math.cbrt(x)	Returns the cube root of x	Math.cbrt(27); // 3
Math.pow(x, y)	Returns x to the power of y	Math.pow(4, 5); // 1024
Math.max(x, y, …)	Returns the largest of a series of numbers	Math.max(6, 12, 9); // 12
Math.min(x, y, …)	Returns the smallest of a series of numbers	Math.min(6, 12, 9); // 6
Math.random()	Returns a random value between 0 and 1	Math.random(); // 0.9936125778727947

Math functions

Method	Description	Example

Math.round(x)	Rounds x to the nearest integer	Math.round(2.3); // 2
		Math.round(2.9); // 3
		Math.round(2.5); // 3

Math.ceil(x)	Rounds **up** x to the nearest integer	Math.ceil(2.3); // 3
		Math.ceil(2.9); // 3
		Math.ceil(2.5); // 3

Math.floor(x)	Rounds **down** x to the nearest integer	Math.floor(2.3); // 2
		Math.floor(2.9); // 2
		Math.floor(2.5); // 2

Math.trunc(x)	Returns only the integer of x	Math.trunc(2.3); // 2
		Math.trunc(100.45); // 100
		Math.trunc(-12.3); // -12

Practice: Math object

Try writing some formulas you know into JavaScript code using the Math object.

e.g.

Pythagoras’s theorem: C = Math.sqrt(Math.pow(A, 2) + Math.pow(B, 2))

9.3 Date Object

Date object

The Date object allows us to display dates dynamically, instead of just using a string.

Date object

By default, the Date object will read the data from your browser and display the full current date and time.

Date object

```
console.log(Date());
// Wed May 19 2021 13:28:24 GMT+0800 (Hong Kong Standard Time)
```

Set Date object

To create a Date object, we use the new keyword.

e.g.

```
var current = new Date();
```

Set Date object

We can then use methods to set the specific parts of the Date object.

Set Date object methods

Method	Description	Example (Default: Wed May 19 2021 13:28:24)

setFullYear ()	Set the year, or optionally the month and day	date = setFullYear(2018); // Wed May 19 2018 13:28:24
		date = setFullYear(2018, 5, 25); // Mon Jun 25 2018 13:28:24

setMonth()	Set the month (0-11)	date = setMonth(11); // Sun Dec 19 2021 13:28:24
setDate()	Set the date (1-31)	date = setDate(21); // Fri May 21 2020 13:28:24
setHours()	Set the hour (0-23)	date = setHours(11); // Wed May 19 2021 11:28:24

Set Date object methods

Method	Description	Example (Default: Wed May 19 2021 13:28:24)
setMinutes()	Set the minutes (0-59)	date = setMinutes(41); // Wed May 19 2021 13:41:24
setSeconds()	Set the seconds (0-59)	date = setSeconds(35); // Wed May 19 2021 13:28:35
setMilliseconds()	Set the milliseconds (0-999)	date = setMilliseconds(450); // Wed May 19 2021 13:28:24
setTime()	Set the time (in milliseconds from Jan 1 1970)	date = setTime(999999999999); // Sun Sep 09 2001 09:46:39

JavaScript: Method

Set Date object

Note:

- January is represented by 0, and December is 11.
- Sunday is the first day of the week and is represented by 0, and Saturday is 6.

JavaScript: Method

Get Date object

We can also use methods to return specific portions of a Date object.

Get Date object methods

Method	Description	Example (date = Wed May 19 2021 13:28:24)
getFullYear()	Get the year as a number	date = getFullYear(); // 2021
getMonth()	Get the month as a number	date = getMonth(); // 4
getDate()	Get the date as a number	date = getDate(); // 19
getHours()	Get the hour as a number	date = getHours(); // 13
getMinutes()	Get the minute as a number	date = getMinutes(); // 28

Get Date object methods

Method	Description	Example (date = Wed May 19 2021 13:28:24)
getSeconds()	Get the second as a number	date = getSeconds(); // 24
getMilliseconds()	Get the millisecond as a number	date = getMilliseconds); // 314
getTime()	Get the time as a number (in milliseconds from Jan 1 1970)	date = getTime(); // 1621402104246
getDay()	Get the day of the week as a number	getDay() = 3
Date.now()	Get the current time (in milliseconds from Jan 1 1970)	Date.now() // 1621402104976

Practice: Date object

Spend some time to familiarize yourself with the Date object and its methods. For example, try creating a Date object and setting it to your birthday or a famous date in history.

9.4 Array Methods

Array

Arrays are special kinds of objects which can be used to store multiple values in a variable.

Array methods

Some array methods you should already now are .pop(), .shift() and .splice(). They are used to change the contents of an array.

Sorting arrays

We can also use methods to sort the values inside an array. sort() sorts an array’s elements as strings in alphabetical order

sort() example

```
var students = [“Scott”, “Dean”, “Robert”, “Eric”];

students.sort();

console.log(students);

// [“Dean”, “Eric”, “Robert”, “Scott”]
```

reverse()

reverse() reverses the order of an array. We can combine it with sort() to sort an array in reverse alphabetical order.

JavaScript: Method

reverse() example

```
var students = [“Scott”, “Dean”, “Robert”, “Eric”];
students.sort();
students.reverse();
console.log(students);
// ["Scott", "Robert", "Eric", "Dean"]
```

Sorting arrays

Don’t use sort() to sort an array with numbers, because JavaScript will treat them as strings.

JavaScript: Method

Sorting numbers

```
var x = [20, 1000, 4];

x.sort();

console.log(x);

// 1000, 20, 4
```

join()

Use join() to convert an array into a string with specific separators between each element.

JavaScript: Method

join() example

```
var days = [“Monday”, “Tuesday”, “Wednesday”, “Thursday”];
console.log(days.join(“ ==> “));
// “Monday ==> Tuesday ==> Wednesday ==> Thursday”
```

Practice: Array methods

Spend some time to familiarize yourself with array methods. Try them on your arrays from lesson 6.

The End

DECT
Knowledge
Tools
Skills

Reference 1: MDN JavaScript reference

https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference

Reference 2: W3 Schools JavaScript Tutorial https://www.w3schools.com/js/default.asp