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Introduction

JavaScript

JavaScript is a programming language that powers the dynamic behavior on most websites. Alongside HTML and CSS, it is a core technology that makes the web run.

Methods

Methods return information about an object, and are called by appending an instance with a period `.`, the method name, and parentheses.

```
// Returns a number between 0 and 1
Math.random();
```

Libraries

Libraries contain methods that can be called by appending the library name with a period `.`, the method name, and a set of parentheses.

```
Math.random();
// ☝ Math is the library
```

`console.log()`

The `console.log()` method is used to log or print messages to the console. It can also be used to print objects and other info.

```
console.log('Hi there!');
// Prints: Hi there!
```

Numbers

Numbers are a primitive data type. They include the set of all integers and floating point numbers.

```
let amount = 6;
let price = 4.99;
```

String `.length`

The `.length` property of a string returns the number of characters that make up the string.

```
let message = 'good nite';
console.log(message.length);
// Prints: 9

console.log('howdy'.length);
// Prints: 5
```

Data Instances

When a new piece of data is introduced into a JavaScript program, the program keeps track of it in an instance of that data type. An instance is an individual case of a data type.

Booleans

Booleans are a primitive data type. They can be either `true` or `false`.

```
let lateToWork = true;
```

`Math.random()`

The `Math.random()` function returns a floating-point, random number in the range from 0 (inclusive) up to but not including 1.

```
console.log(Math.random());
// Prints: 0 - 0.9
```

`Math.floor()`

The `Math.floor()` function returns the largest integer less than or equal to the given number.

```
console.log(Math.floor(5.95));
// Prints: 5
```

Single Line Comments

In JavaScript, single-line comments are created with two consecutive forward slashes `//`.

```
// This line will denote a comment
```

Null

Null is a primitive data type. It represents the intentional absence of value. In code, it is represented as `null`.

```
let x = null;
```

Strings

Strings are a primitive data type. They are any grouping of characters (letters, spaces, numbers, or symbols) surrounded by single quotes `'` or double quotes `"`.

```
let single = 'Wheres my bandit hat?';
let double = "Wheres my bandit hat?";
```

Arithmetic Operators

JavaScript supports arithmetic operators for:

- `+` addition
- `-` subtraction
- `*` multiplication
- `/` division
- `%` modulo

```
// Addition
5 + 5
// Subtraction
10 - 5
// Multiplication
5 * 10
// Division
10 / 5
// Modulo
10 % 5
```

Multi-line Comments

In JavaScript, multi-line comments are created by surrounding the lines with `/*` at the beginning and `*/` at the end. Comments are good ways for a variety of reasons like explaining a code block or indicating some hints, etc.

```
/*
The below configuration must be
changed before deployment.
*/

let baseUrl = 'localhost/taxwebapp/country';
```

Remainder / Modulo Operator

The remainder operator, sometimes called modulo, returns the number that remains after the right-hand number divides into the left-hand number as many times as it evenly can.

```
const weeksInYear = Math.floor(365/7) // calculates
# of weeks in a year, rounds down to nearest integer
const daysLeftOver = 367 % 7 // calcuates the number
of days left over after 365 is divded by 7

console.log("A year has " + weeksInYear + "weeks "
and "daysLeftOver " + days)
```

Assignment Operators

An assignment operator assigns a value to its left operand based on the value of its right operand. Here are some of them:

- `+=` addition assignment
- `-=` subtraction assignment
- `*=` multiplication assignment
- `/=` division assignment

```
let number = 100;

// Both statements will add 10
number = number + 10;
number += 10;

console.log(number);
// Prints: 120
```

String Interpolation

String interpolation is the process of evaluating string literals containing one or more placeholders (expressions, variables, etc).

It can be performed using template literals: `text ${expression} text`.

```
let age = 7;

// String concatenation
'Tommy is ' + age + ' years old.';

// String interpolation
`Tommy is ${age} years old.`;
```

Variables

Variables are used whenever there's a need to store a piece of data. A variable contains data that can be used in the program elsewhere. Using variables also ensures code re-usability since it can be used to replace the same value in multiple places.

```
const currency = '$';
let userIncome = 85000;

console.log(currency + userIncome + ' is more than
the average income.');
// Prints: $85000 is more than the average income.
```

Undefined

`undefined` is a primitive JavaScript value that represents lack of defined value. Variables that are declared but not initialized to a value will have the value `undefined`.

```
var a;

console.log(a);
// Prints: undefined
```

Learn Javascript: Variables

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A variable is a container for data that is stored in computer memory. It is referenced by a descriptive name that a programmer can call to assign a specific value and retrieve it.

```
// examples of variables
let name = "Tammy";
const found = false;
var age = 3;
console.log(name, found, age);
// Tammy, false, 3
```

Declaring Variables

To declare a variable in JavaScript, any of these three keywords can be used along with a variable name:

- `var` is used in pre-ES6 versions of JavaScript.
- `let` is the preferred way to declare a variable when it can be reassigned.
- `const` is the preferred way to declare a variable with a constant value.

```
var age;
let weight;
const numberOfFingers = 20;
```

Template Literals

Template literals are strings that allow embedded expressions, `${expression}`. While regular strings use single `'` or double `"` quotes, template literals use backticks instead.

```
let name = "Codecademy";
console.log(`Hello, ${name}`);
// Prints: Hello, Codecademy

console.log(`Billy is ${6+8} years old.`)
// Prints: Billy is 14 years old.
```

`let` Keyword

`let` creates a local variable in JavaScript & can be re-assigned. Initialization during the declaration of a `let` variable is optional. A `let` variable will contain `undefined` if nothing is assigned to it.

```
let count;
console.log(count); // Prints: undefined
count = 10;
console.log(count); // Prints: 10
```

`const` Keyword

A constant variable can be declared using the keyword `const`. It must have an assignment. Any attempt of re-assigning a `const` variable will result in JavaScript runtime error.

```
const numberOfColumns = 4;
numberOfColumns = 8;
// TypeError: Assignment to constant variable.
```

String Concatenation

In JavaScript, multiple strings can be concatenated together using the `+` operator. In the example, multiple strings and variables containing string values have been concatenated. After execution of the code block, the `displayText` variable will contain the concatenated string.

```
let service = 'credit card';
let month = 'May 30th';
let displayText = 'Your ' + service  + ' bill is due
on ' +  month + '.';

console.log(displayText);
// Prints: Your credit card bill is due on May 30th.
```