

JavaScript

The programming Language of the web



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Introduction to JavaScript

- What is Javascript?

JavaScript is the programming language of the Web

- What is a programming language?

Put simply, programming is giving a set of instructions to a computer to execute

NOTE: * JavaScript is not Java

* JavaScript is also called ECMA Script or JScript

Introduction to JavaScript

What can Javascript do?

- Websites
- Web applications
- Web servers
- Games
- Mobile apps
- Flying robots, LOL

Introduction to JavaScript

Additional Information

- JavaScript is the world's most popular programming language
- JavaScript was originally named Mocha, later it was renamed to LiveScript, and then to JavaScript
- JavaScript was named so because when it was first released in 1995, Java was a popular language then, so it is assumed to have rode Java's popularity
- JavaScript is updated yearly

Commonly Asked Questions

- How do I get JavaScript?

You don't have to get or download JavaScript.

- Where can I download JavaScript?

JavaScript is already running in your browser on your computer, on your tablet, and on your smart-phone.

- Is JavaScript Free?

JavaScript is free to use for everyone

Basic JavaScript

How we use it

We use JavaScript on web pages by adding the **<script>** tag as a child of the head tag. Or on some other occasions we add it to the body tag

```
<!DOCTYPE html>
<html>
  <head>
    <title>Document</title>
    <script src="Sample.js"></script>
  </head>
  <body>
    <h1>JavaScript</h1>
    <p>We are learning js</p>
  </body>
</html>
```



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JS

Basic JavaScript

Our first look at JavaScript

```
alert("Hello World");
```


Basic JavaScript

Variable

Variables allow computers to store and manipulate data. They do this by using a "label" to point to the data rather than using the data itself. Any of the eight *data types* may be stored in a variable

Basic JavaScript

Variable

In JavaScript we create variables using the **var** keyword. For example,

```
var animal = "goat";
```

This is called a variable declaration. *animal* is the name of the variable, declared using the **var** keyword, “goat” is the value assigned, and the value is of the **string** data type

Basic JavaScript

Data types

- Number
- String
- Boolean
- Undefined
- Null
- Object
- Symbol
- BigInt

Basic JavaScript

Data types

Number

Basically any number like **1**, **-33** or **1960**.

Computers can perform mathematical operations on a number, but not on a string.

Basic JavaScript

Data types

String

Characters enclosed in single or double quotation marks. For example, `"#hello"`, `'2020'`, `'@b007c4mp'`, `"page not found"`, or even when there are no characters between the quotation marks like here `""`, in this case it is called an empty string

Basic JavaScript

Data types

Boolean

Boolean, also called bool, is simply **true** or **false**. We use them as conditions to trigger other actions. For example,

```
if (nepa === true) {  
    var activity = "watching TV";  
}
```

Basic JavaScript

Data types

Undefined

A data type that was not assigned a value. For example a variable without a value, automatically has the value undefined

Basic JavaScript

Data types

Null

In computer science, a null value represents a reference that points, generally intentionally, to a nonexistent or invalid object or address

Basic JavaScript

Data types

Object

Objects are useful for storing data in a structured way, and can represent real world objects. For example,

```
var myCountry = {  
  "name": "Nigeria",  
}
```

Basic JavaScript

```
var myCountry = {  
  "name": "Nigeria",  
  "age": 60,  
  "otherName": "Naija",  
  "language": ["English", "Pidgin", "Yoruba", "Igbo", "Hausa"],  
  "singAnthem": function() {return "singing " + this.name + " is " + this.age }  
}
```



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JS

Basic JavaScript

Data types

Symbol

A symbol value is an anonymous, unique value created by invoking the function Symbol

Basic JavaScript

Data types

BigInt

In JavaScript, BigInt is a numeric data type that can represent integers of any value (greater than $2^{53} - 1$) in a precise format. In other programming languages different numeric types can exist, for examples: Integers, Floats, Doubles, or Bignums

Basic JavaScript

Additional Information

- Since the release of ECMA Script 6 in 2015, we no longer use **var** for variable declaration. We use **let** and **const**, along with many other newer features
- The values **15** and **"15"** are not the same, one is a number, the other a string, but JavaScript will try to evaluate them if given like this for example

15 + "15"

Basic JavaScript

Operators

Operators are used to carry out specific tasks and functionality in JavaScript. The plus sign **+** is an operator, same as the minus sign

-

So we can do things like addition

1 + 1

or subtraction

26 - 5

Basic JavaScript

Operators

In JavaScript there are different kinds of operators namely;

- Arithmetic Operators
- Assignment Operators
- String Operators
- Comparison Operators
- Logical Operators
- Type Operators

Basic JavaScript

Operators

Arithmetic operators

Arithmetic operators such as addition or multiplication take two number values and produce a new number from them. For example **3 + 5** will return 8, and **10 * 12** will return 120

Basic JavaScript

Operators

Arithmetic operators

The arithmetic operators currently in JavaScript are the **addition** operator (+), **subtraction** operator (-), **multiplication** operator (*), **exponentiation** operator (**), **division** operator (/), **modulus** operator (%), **increment** operator (++), and the **decrement** operator (--)

Basic JavaScript

Operators

Assignment operators

An assignment operator assigns a value to its left operand based on the value of its right operand. A simple assignment operator is equal (=), which assigns the value of its right operand to its left operand. That is, **x = 3** assigns the value of 3 to x



Basic JavaScript

Operators

Assignment operators

The assignment operators in JavaScript are

`(=), (+=), (-=), (*=), (/=), (%=), (**=)`

Basic JavaScript

Operators

Assignment operators

Operator	Example	Same As
=	x = y	x = y
+=	x += y	x = x + y
-=	x -= y	x = x - y
*=	x *= y	x = x * y
/=	x /= y	x = x / y
%=	x %= y	x = x % y
**=	x **= y	x = x ** y

Basic JavaScript

Operators

String operators

The (+) operator can also be used to add strings. For example, “Java” + “Script” will return “JavaScript”. This is not addition (since these are not numbers), this is called **concatenation**

Another string operator is (+=)

Basic JavaScript

Operators

Comparison operators

A comparison operator compares its operands and returns a logical value based on whether the comparison is true. For example,

```
var num = 5;  
"5" == num    // this will return true
```

Basic JavaScript

Operators

Comparison operators

The following are the comparison operators in JavaScript

```
(==), (===), (!=), (!==), (>), (<), (>=), (<=), (?)
```

Basic JavaScript

Operators

Logical operators

Logical operators are used to determine the logic between variables or values. It can be used to control the behaviour of your program. For example,

```
if (age >= 18 && gender == "female") {  
    var person = "Adult Woman";  
}
```


Basic JavaScript

Operators

Logical operators

The logical operators are;

(**&&**), (**||**), (**!**)

Basic JavaScript

Operators

Type operators

Type operators return additional information about a variable or data type. The two type operators are **typeof** and **instanceof**

```
var time = "noon";  
typeof time    //this will return "string"
```

Basic JavaScript

Additional Information

- Whenever we perform an action, we can **log** the result in the console using the **console.log** method
- The operator precedence is similar to maths

```
console.log(3 + 4 * 5) // 3 + 20
```

Basic JavaScript

Conditional Statements

Use **if** to specify a block of code to be executed, if a specified condition is true

Use **else** to specify a block of code to be executed, if the same condition is false

Use **else if** to specify a new condition to test, if the first condition is false

Use **switch** to specify many alternative blocks of code to be executed

Basic JavaScript

JavaScript Functions

A JavaScript function is a block of code designed to **perform** a particular task

Basic JavaScript

JavaScript Events

Events are actions that happen in our HTML that JavaScript can **react** to