

Agenda

- **JavaScript History**
 - A brief tour of the history of JS
- **Java ≠ JavaScript**
 - What are the similarities?
 - What are the differences?
- **Where to “run” JS**
 - Browser
 - Node.js
- **JavaScript Fundamentals**



JavaScript History: The Bad Parts

JavaScript has lots of bad parts.

In JavaScript, there is a beautiful, elegant, highly expressive language that is buried under a steaming pile of good intentions and blunders.

- Douglas Crockford

JavaScript: The Good Parts (Crockford)

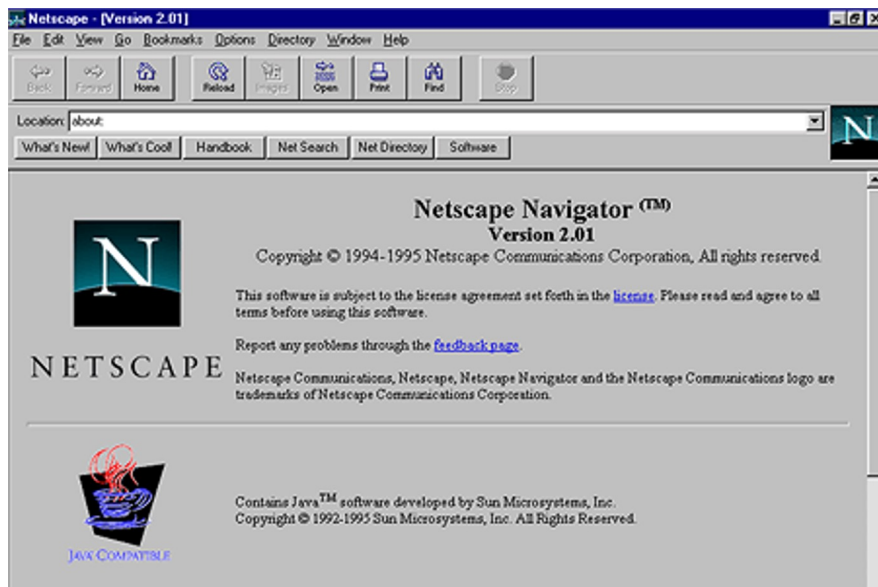
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JavaScript History: Scripting the Browser

In 1995 Brendan Eich was recruited by Netscape to “come do Scheme in the browser”

Netscape was a popular early browser:



JavaScript: The First 20 Years

ALLEN WIRFS-BROCK, Wirfs-Brock Associates, Inc., USA

BRENDAN EICH, Brave Software, Inc., USA

Shepherds: Sukyoung Ryu, KAIST, South Korea

Richard Gabriel (poet, writer, computer scientist), California

How a sidekick scripting language for Java, created at Netscape in a ten-day hack, ships first as a de facto Web standard and eventually becomes the world's most widely used programming language. This paper tells the story of the creation, design, evolution, and standardization of the JavaScript language over the period of 1995–2015. But the story is not only about the technical details of the language. It is also the story of how people and organizations competed and collaborated to shape the JavaScript language which dominates the Web of 2020.

CCS Concepts: • General and reference → Computing standards, RFCs and guidelines; • Information systems → World Wide Web; • Social and professional topics → History of computing; History of programming languages; • Software and its engineering → General programming languages; Scripting languages.

Additional Key Words and Phrases: JavaScript, ECMAScript, Standards, Web browsers, Browser game theory, History of programming languages

ACM Reference Format:

Allen Wirfs-Brock and Brendan Eich, 2020. JavaScript: The First 20 Years. *Proc. ACM Program. Lang.* 4, HOPL, Article 77 (June 2020), 189 pages. <https://doi.org/10.1145/3386327>

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JavaScript: The First 20 Years, Allen Wirfs-Brock and Brendan Eich

JavaScript History: Scripting the Browser

The candidates for a web page scripting language included research languages such as Scheme as well as Unix-based languages such as Perl, Python, and Tcl, and Microsoft's Visual Basic.

Although Brendan was expecting to implement Scheme in the browser, senior managers at Netscape and Sun (Marc Adreessen and Bill Joy) wanted him to build a language that complemented Java.

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JavaScript History: Scripting the Browser

This companion language to Java would have to look like Java while remaining easy to use and object-based rather than class-based, like Java.

The code-name “Mocha” was chosen for the browser scripting language by Marc Andreessen with the intent that it would eventually be renamed to JavaScript.

Brendan prototyped Mocha in 10 contiguous days in May, 1995.

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JavaScript History: Scripting the Browser

The prototype used a hand-written lexer and recursive-descent parser that emitted bytecode instructions. The bytecode interpreter was simple and slow.

The demo consisted of the bare minimum language implemented and minimally integrated into the Netscape 2 pre-alpha browser.

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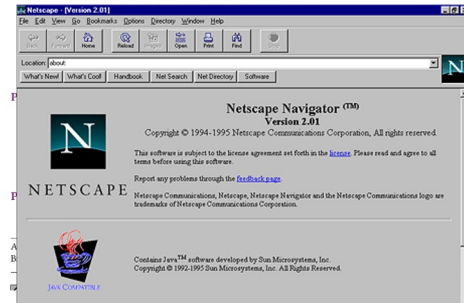
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JavaScript History: Scripting the Browser

On December 4, 1995 in a joint release by Netscape and Sun announced JavaScript describing it as “an object scripting language” that would be used to write scripts that dynamically “modify the properties of and behavior of Java objects.”

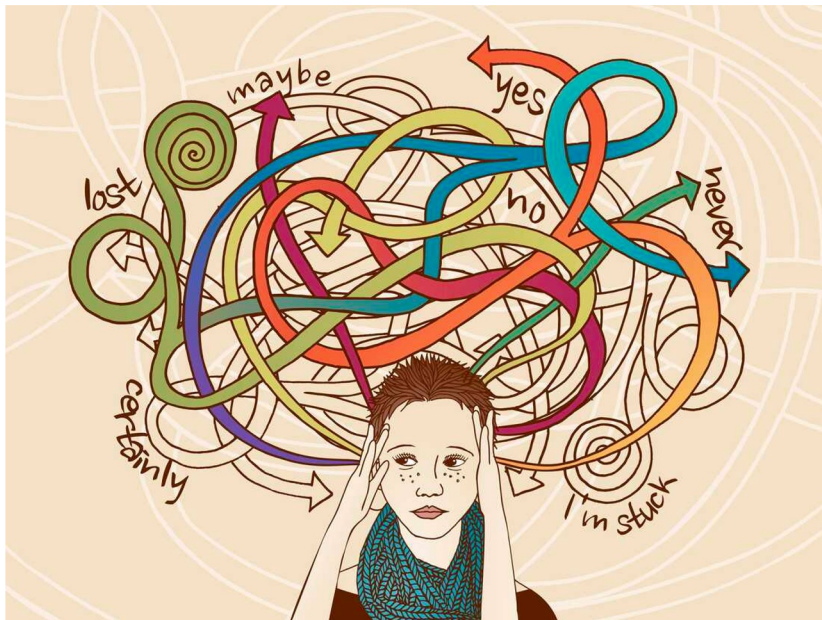
It would serve as a “complement to Java for easy online application development.”



JavaScript: The First 20 Years, Allen Wirfs-Brock and Brendan Eich

JavaScript History: Scripting the Browser

The name similarity and its implication that the languages are closely related has been a continuing source of confusion.



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JavaScript History: Scripting the Browser

Netscape originally wanted to use JavaScript on the server in an environment called LiveWire that would dynamically generate web pages on the server. For a variety of circumstances this was a failure.

JavaScript eventually made its way onto the server (Node.js).



JavaScript: The First 20 Years, Allen Wirfs-Brock and Brendan Eich

Java

- Each statement ends in a semicolon
- Has classes; create objects from classes
- Static types
 - `int i = 4; String s = "hello";`
 - `i = s; // this is an error!`
- Lexically scoped (or blocked scoped)

```
int x;
{
    {
        int x;
        ... X ...
    }
    ... X ...
}
```

```
1 public class Hello {
2     private String message;
3
4     public static void main(String[] args) {
5         message = "Hello, World!";
6         System.out.println("Hello, World!");
7     }
8 }
```

JavaScript: Data Types and Literals

- JavaScript Data Types

- string
- number
- object
- boolean
- undefined

- JavaScript Literals

- string: "hello", 'hello'
- number: 56, 3.14, 0xFF
- object: {}
- object/array: []
- boolean: true, false
- object: null
- undefined: undefined

[JavaScript data types and data structures](#),
MDN Web Docs

```
> typeof "this"
```

```
< 'string'
```

```
> typeof 56
```

```
< 'number'
```

```
> typeof {}
```

```
< 'object'
```

```
> typeof []
```

```
< 'object'
```

```
> typeof true
```

```
< 'boolean'
```

```
> typeof null
```

```
< 'object'
```

```
> typeof undefined
```

```
< 'undefined'
```

JavaScript: Variable Declarations

- Variable Declarations
 - const
 - let
 - var
 - none of the above (do not do this!)
- JavaScript Literals
 - string: "hello", 'hello'
 - number: 56, 3.14, 0xFF
 - object: {}
 - object/array: []
 - boolean: true, false
 - object: null
 - undefined: undefined

[Grammar and types / Literals,](#)

MDN Web Docs

```
> typeof "this"
```

```
< 'string'
```

```
> typeof 56
```

```
< 'number'
```

```
> typeof {}
```

```
< 'object'
```

```
> typeof []
```

```
< 'object'
```

```
> typeof true
```

```
< 'boolean'
```

```
> typeof null
```

```
< 'object'
```

```
> typeof undefined
```

```
< 'undefined'
```

JavaScript Overview

- console.log
- console.assert
- == vs ===
- boolean: true/false
- string, string.length, comparison
- array, create, insert, indexing
- object, create, insert, indexing, dot operator
- const, let, var
- functions, scope, parameters, return, calls
- branching
- looping

[JavaScript](#), Mozilla Developer Network (MDN)

This is an excellent resource for learning and exploring the JavaScript language and other web technologies.

- [let](#)
- [JavaScript data types and data structures](#)
- [Object](#)
- [Array](#)
- [Functions](#)



Let's bring up [VSCode](#) and start playing with some JavaScript!