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Intro To JavaScript

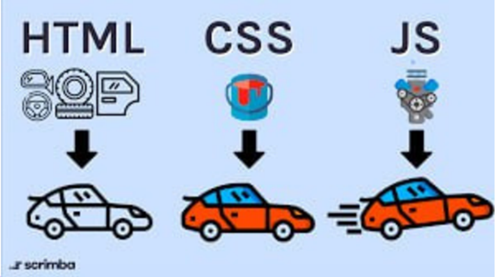
Goal of Class

- Describe JavaScript
- Work with simple syntax and data types
- Write small programs using variables and operators
- Check code with console.log()
- Connect JavaScript to HTML and CSS

What is JavaScript?

- JavaScript is a high-level, dynamic programming language.
- It runs inside the browser and makes webpages interactive.
- It allows the page to respond to the user, update itself, and run logic.

HTML = structure
CSS = styling
JavaScript = behavior


HTML
CSS
JS
scrimba

Without JavaScript, websites are static. With JS, websites can:

- Respond to clicks
- Update content dynamically
- Validate forms
- Animate elements
- Communicate with servers

- JavaScript is the only language browsers can run natively.
- It is event-driven.
- It is dynamic and flexible.
- It can run both on client and server side.

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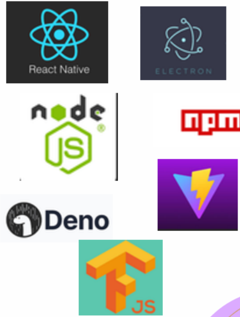
FUN-FACT

JS originally ran only in browsers, but today it also runs on servers via Node.js.

Today, JS is everywhere:

- Websites
- Mobile apps (React Native)
- Desktop apps (Electron)
- Servers (Node.js)
- Game engines
- Browser extensions

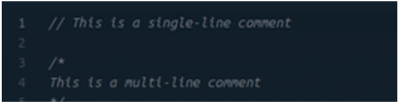


How JavaScript Looks and Works

JavaScript syntax is the rules for writing JS code.

Comments

Used to explain code. Ignored by the computer.

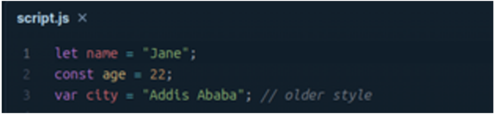


```
// This is a single-line comment

/*
This is a multi-line comment
*/
```

Variables

Variables store data.



```
let name = "Jane";
const age = 22;
var city = "Addis Ababa"; // older style
```

Var, Let and Const

- **var**: Function-scoped, can be redeclared and reassigned, and may lead to issues with hoisting.
- **let**: Block-scoped, can be reassigned but not redeclared in the same scope, and avoids some issues with hoisting.
- **const**: Block-scoped, cannot be reassigned or redeclared, and is used for values that should remain constant.

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What score do you think we will get?

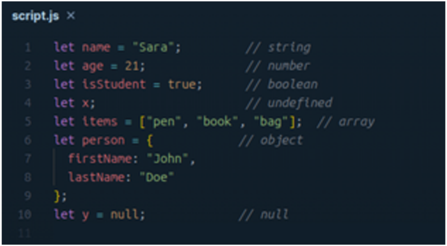
```
let score = 10;
score = 20;
console.log(score);  //Think when we print it
```

20 or 10?

Data Types

JavaScript has 7 basic data types:

1. String – text,   eg: "hello"
2. Number – any number eg: 10, 3.14
3. Boolean – true/false
4. Undefined – variable declared but not assigned
5. Null – empty value
6. Object – collection of data in key value pair
7. Array – ordered list   eg: [1, 2, 3]



```
let name = "Sara";          // string
let age = 21;               // number
let isStudent = true;       // boolean
let x;                      // undefined
let items = ["pen", "book", "bag"];  // array
let person = {             // object
  firstName: "John",
  lastName: "Doe"
};
let y = null;              // null
```

Operators

Operators allow you to perform actions on data.

Arithmetic Operators

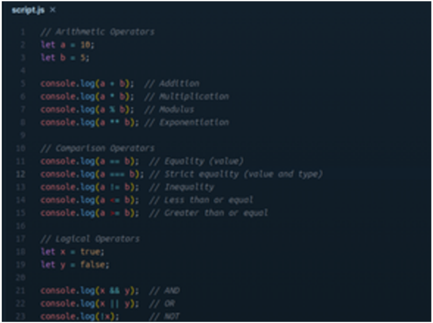
+, -, *, /, %, **

Comparison Operators

==, ===, !=, <, >, <=, >=

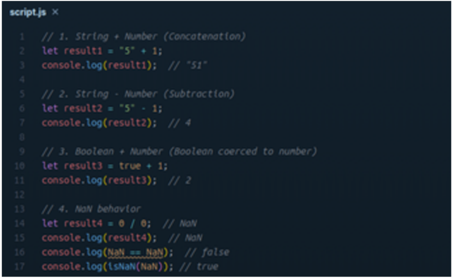
Logical Operators

&& (and), || (or), ! (not)

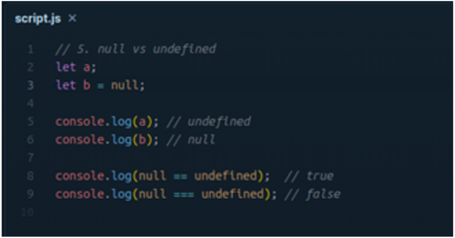


```javascript
// Arithmetic Operators
let a = 10;
let b = 5;

console.log(a + b);  // Addition
console.log(a * b);  // Multiplication
console.log(a % b);  // Modulus
console.log(a ** b); // Exponentiation

// Comparison Operators
console.log(a == b);  // Equality (value)
console.log(a === b); // Strict equality (value and type)
console.log(a != b);  // Inequality
console.log(a <= b);  // Less than or equal
console.log(a >= b);  // Greater than or equal

// Logical Operators
let x = true;
let y = false;

console.log(x && y);  // AND
console.log(x || y);  // OR
console.log(!x);      // NOT
```

Quirks of JavaScript



```javascript
// 1. String + Number (Concatenation)
let result1 = "5" + 1;
console.log(result1);  // "51"

// 2. String - Number (Subtraction)
let result2 = "5" - 1;
console.log(result2);  // 4

// 3. Boolean + Number (Boolean coerced to number)
let result3 = true + 1;
console.log(result3);  // 2

// 4. NaN behavior
let result4 = 0 / 0;  // NaN
console.log(result4);  // NaN
console.log(NaN == NaN);  // false
console.log(isNaN(NaN)); // true
```



```
// 5. null vs undefined
let a;
let b = null;

console.log(a); // undefined
console.log(b); // null

console.log(null == undefined);  // true
console.log(null === undefined); // false
```

Console.log, Alert and Prompt

Console.log prints information to the browser console. It helps you see what your code is doing and is used for debugging.

Alert is a popup that appears on the webpage and is used for communication.

Prompt is a built-in JavaScript function that displays a dialog box asking the user for input and returns the entered value as a string.

Where to find your browser console

- Right-click the page
- Click Inspect
- Go to Console tab

or

- Ctrl + Shift + I
- Go to Console tab

Tasks

- Write code that prints your name in the console.
- Show an alert that says: Hello, world!

Answers

- Write code that prints your name in the console.

```
console.log("Leah");
```

- Show an alert that says: Hello, world!

```
alert("Hello, world!");
```

Console.log() != alert

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How does JavaScript interact with HTML + CSS

JavaScript manipulates HTML using the DOM (Document Object Model).

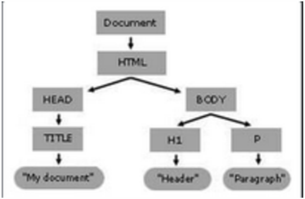
What is DOM?

DOM is the bridge between your JavaScript code and your webpage.

- When a browser loads an HTML page, it does not work directly with the raw HTML text. Instead, the browser reads the HTML and constructs an internal, structured representation of the page. This representation is called the Document Object Model, DOM.

- HTML describes the page; the DOM is the browser's translation of that description into a form JavaScript can understand.

- The core DOM defines the entities describing any document and the objects within it



More Tasks

- Ask for the user’s name and alert it back
- Ask for two numbers and show the sum

Answers

- Ask for the user’s name

```
let name = prompt("What is your name?");
alert("Hello " + name);
```

- Ask for two numbers and show the sum

```
let a = prompt("Enter first number:");
let b = prompt("Enter second number:");
alert("Sum is: " + (Number(a) + Number(b)));
```

Q/A

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