

JavaScript Learning Roadmap

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1 History of JavaScript

- Origins of JavaScript (Netscape, ECMAScript)
- Evolution of JavaScript (ES5, ES6/ES2015, and beyond)
- JavaScript's role in modern web development

2 JavaScript Features

- Dynamic and loosely-typed
- Event-driven, non-blocking I/O
- Asynchronous programming (Promises, async/await)

3 Variables

- Declaration: `var`, `let`, `const`
- Hoisting and scope (block scope vs. function scope)

4 Data Types

- Primitive types: `string`, `number`, `boolean`, `null`, `undefined`, `bigint`, `symbol`
- Non-primitive types: Objects (including arrays, functions)
- Type checking with `typeof` and `instanceof`

5 Deep Dive into Variables and Data Types

- Mutability vs. Immutability
- Type conversion (implicit vs. explicit)
- Understanding `null`, `undefined` and `NAN`

6 String Methods

- Common string methods
- String interpolation with template literals

7 Type Conversion and Coercion

- Explicit conversion
- Implicit type coercion
- Falsy values and their behavior in JavaScript (`false`, `0`, `null`, `undefined`, `NaN`, `""`)

8 Operators

- Arithmetic Operators: `+`, `-`, `*`, `/`, `%`, `**` (exponentiation)
- Relational Operators: `<`, `<=`, `>`, `>=`
- Assignment Operators: `+=`, `-=`, `*=`, `/=`, `%=`, `**=`
- Logical Operators: `&&`, `||`, `!`
- Ternary Operator: A shorthand for `if...else`

9 Conditional Statements

- `if` statement
- `if...else` ladder
- Nested `if...else` for complex conditions
- `switch` statement: handling multiple cases

10 Loops

- `for` loop
- `while` loop
- `do...while` loop

11 Object Literals

- Defining objects using literal notation
- Accessing properties using dot notation and bracket notation
- Modifying and adding properties
- Using methods inside objects
- Math object properties and methods

12 Optional Chaining

- Safe navigation of deeply nested objects using `?.`
- Preventing errors from `undefined` or `null` properties

13 Functions

- Function declaration vs function expression
- Parameters, default parameters
- Arrow Functions

14 Array

- Defining arrays and methods
- Array Methods:
 - `forEach()`: Iterates over elements
 - `filter()`: Filters based on condition
 - `map()`: Transforms elements and returns a new array
 - `reduce()`: Reduces array to a single value (e.g., sum)

15 For-of vs For-in

- `for...of`: Iterates over iterable objects (arrays, strings)
- `for...in`: Iterates over object properties

16 Destructuring

- Array Destructuring: Extract values from arrays into variables
- Object Destructuring: Extract values from objects into variables

17 Set and Map

- **Set**: A collection of unique values
- **Map**: A collection of key-value pairs
- Iterating over Sets and Maps

18 Error Handling (try, catch, and finally)

- `try...catch...finally`: Handling runtime errors
- Throwing custom errors

19 JSON

- What is JSON ?
- Converting JavaScript objects to JSON and vice versa

20 Promises

- Understanding the states of a promise (pending, fulfilled, rejected)
- Chaining promises with `.then()` and `.catch()`
- `Promise.all()` and `Promise.race()`

21 Async and Await

- Using `async` functions for asynchronous code
- Awaiting promises with `await`

22 JavaScript in HTML

- Including JS Script inside HTML File
- Document Object Model (DOM) Manipulation