

JavaScript Fundamentals Roadmap

1. Introduction to Programming

- What is Programming?
- Why Learn Programming?

2. Difference Between Compiled and Interpreted Languages

- How Compilation Works
- How Interpretation Works
- Examples of Compiled vs Interpreted Languages

3. Introduction to JavaScript

- What is JavaScript and Why Use It?
- History of JavaScript

4. How JavaScript Works

- JavaScript Engine
- Execution Context
- Call Stack

5. How JavaScript Code is Executed

- Step-by-step Execution of JS Code
- Understanding Single-Threaded Behavior

6. Setting Up JavaScript

- Using the Browser Console
- Setting Up VS Code for JavaScript
- Installing and Using Node.js

7. Writing Your First JavaScript Program

- The "Hello, World!" Program
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8. Variables and Data Types

- Declaring Variables (`var`, `let`, `const`)
 - Difference Between `var`, `let`, and `const`
 - Primitive Data Types (String, Number, Boolean, Null, Undefined, Symbol, BigInt)
 - Type Conversion (Implicit & Explicit)
 - Checking Data Type (`typeof` Operator)
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9. Operators in JavaScript

- Arithmetic Operators (`+`, `-`, `*`, `/`, `%`, `**`)
- Comparison Operators (`==`, `===`, `!=`, `!==`, `>`, `<`, `>=`, `<=`)
- Logical Operators (`&&`, `||`, `!`)
- Assignment Operators (`=`, `+=`, `-=`, `*=`, `/=`, `%=`, `**=`)
- Unary Operators (`++`, `--`, `typeof`)

10. Control Flow (Conditional Statements & Loops)

- `if, else if, else`
- Ternary Operator (`condition ? trueValue : falseValue`)
- `switch` Statement
- Entry Controlled and Exit Controlled Loops
- `for` Loop
- `for...in` Loop
- `for...of` Loop
- `while` Loop
- `do-while` Loop
- `break` and `continue` Statements

11. Functions in JavaScript

- Function Declaration vs Function Expression
- Arrow Functions (`() => {}`)
- Function Parameters & Default Values
- Function Parameters vs Arguments
- Returning Values from Functions
- Immediately Invoked Function Expressions (IIFE)
- Callback Functions

- Hoisting (Variables and Functions)
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12. JavaScript Data Structures

- **Arrays**
 - Creating Arrays (`[]`, `new Array()`)
 - Array Methods (`push`, `pop`, `shift`, `unshift`, `splice`, `slice`, `concat`, `map`, `filter`, `reduce`)
 - **Objects**
 - Creating Objects (`{ key: value }`)
 - Accessing Properties (`dot notation`, `bracket notation`)
 - Adding, Updating, and Deleting Properties
 - Object Destructuring
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13. Asynchronous JavaScript (Basics)

- Synchronous vs Asynchronous Execution
 - Callbacks & Callback Hell
 - Promises (`resolve`, `reject`, `.then`, `.catch`)
 - `async` & `await`
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14. JavaScript ES6+ Features

- Template Literals (`Hello ${name}`)
 - Destructuring (Array & Object Destructuring)
 - Spread & Rest Operators (`...`)
 - Default Parameters in Functions
 - Modules (`import` / `export`)
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15. Advanced JavaScript Concepts

- Higher-Order Functions (Functions as Arguments & Return Values)
 - `this` Keyword & How It Works
 - Prototypes & Prototype Inheritance
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