JavaScript Fundamentals Roadmap

# Introduction to Programming

* + What is Programming?
  + Why Learn Programming?

# Difference Between Compiled and Interpreted Languages

* + How Compilation Works
  + How Interpretation Works
  + Examples of Compiled vs Interpreted Languages

# Introduction to JavaScript

* + What is JavaScript and Why Use It?
  + History of JavaScript

# How JavaScript Works

* + JavaScript Engine
  + Execution Context
  + Call Stack

# How JavaScript Code is Executed

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

# Setting Up JavaScript

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

# Writing Your First JavaScript Program

* + The "Hello, World!" Program

# 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)

# Operators in JavaScript

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

# 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

# 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)

# 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

# Asynchronous JavaScript (Basics)

* + Synchronous vs Asynchronous Execution
  + Callbacks & Callback Hell
  + Promises (resolve, reject, .then, .catch)
  + async & await

# JavaScript ES6+ Features

* + Template Literals (Hello ${name})
  + Destructuring (Array & Object Destructuring)
  + Spread & Rest Operators (...)
  + Default Parameters in Functions
  + Modules (import / export)

# Advanced JavaScript Concepts

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