JavaScript Crash Course — Lesson Notes

What is JavaScript?

JavaScript is the programming language of the web. It adds interactivity, dynamic content, and logic to web pages. It runs in the browser and on the server (Node.js).

Core Concepts

Variables

```javascript
let name = "Alice";        // Can be reassigned
const age = 25;            // Cannot be reassigned
var legacy = "avoid";      // Function-scoped (legacy, avoid)
```

Data Types

Type	Example	Notes
String	`"hello"`	Text data
Number	`42, 3.14`	Integers and floats
Boolean	`true, false`	Logical values
Array	`[1, 2, 3]`	Ordered collection
Object	`{name: "Ali"}`	Key-value pairs
null / undefined	`null, undefined`	Absence of value

Functions

```javascript
// Function declaration
function greet(name) {
  return `Hello, ${name}!`;
}

// Arrow function (ES6)
const greet = (name) => `Hello, ${name}!`;
```

Control Flow

```javascript
if (score >= 90) {
  grade = "A";
} else if (score >= 80) {
  grade = "B";
} else {
  grade = "C";
}

// Loops
for (let i = 0; i < 5; i++) { console.log(i); }
for (const item of array) { console.log(item); }
```

DOM Manipulation

```javascript
const btn = document.querySelector("#myButton");
btn.addEventListener("click", () => {
  document.querySelector("#output").textContent = "Clicked!";
});
```

Key Takeaways

1. Use `const` by default, `let` when reassignment is needed, never `var`.
2. JavaScript is single-threaded but handles async with the event loop.
3. Template literals (backticks) make string interpolation clean.
4. Always use === (strict equality) instead of ==.

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