ProSensia

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Variables (var, let, const) and Data Types in JavaScript

Objective

To explore:

- How to declare and use variables in JavaScript
- Understand the **difference between var, let, and const**
- Learn about JavaScript's **primitive and reference data types**

Variables in JavaScript
What is a Variable?

A variable in JavaScript is a **named container** for storing data. You can change or reuse the value during the execution of a program.

Declaration Keywords

Keyword	Scope	Reassignment	Hoisting	Use Case
var	Function scope	✅ Yes	✅ Hoisted (initialized as undefined)	Older JS code
let	Block scope	✅ Yes	❌ Not hoisted (temporal dead zone)	Modern JS
const	Block scope	❌ No	❌ Not hoisted	Constants that never change

Example

```
var x = 5;
let y = 10;
const z = 15;

x = 20; // allowed
y = 25; // allowed
// z = 30; ❌ Error: Assignment to constant variable
```

Scope

Function Scope (var)

```
function test() {
  var message = "Hello!";
  console.log(message);
}
test();
// console.log(message); ❌ ReferenceError
```

🔷 Block Scope (let, const)

```
{
  let name = "Ali";
  const age = 20;
  console.log(name, age);
}
// console.log(name); ❌ Error
```

JavaScript Data Types

JavaScript supports two main categories:

1. Primitive Types (immutable, stored by value)

Type	Example
String	"Hello"
Number	42, 3.14
Boolean	true, false
Null	null
Undefined	undefined
Symbol	Symbol('id')
BigInt	12345678901234567890n

2. Reference Types (mutable, stored by reference)

Type	Example
Object	{name: "Sara", age: 30}
Array	[1, 2, 3]
Function	function greet() {}

Examples

```
let name = "Ayesha";      // String
let age = 22;             // Number
let isStudent = true;     // Boolean
let course = undefined;   // Undefined
let fee = null;           // Null

let person = { name: "Ayesha", age: 22 };  // Object
let hobbies = ["reading", "coding"];       // Array
```

Common Mistakes & Tips

- Avoid using var in modern code — use let and const
- Always initialize variables
- Use const by default unless you need to reassign
- Strings use double " " or single ' ', but be consistent

Conclusion

Today’s session helped me understand how JavaScript handles **variables and data types**. Learning the difference between var, let, and const is essential for **writing clean, bug-free code**. Understanding primitive and reference types will also help me manage memory and logic more effectively.