JavaScript Variables - Complete Notes

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In JavaScript, variables are used to store data values. A variable is like a container for data. Variables can be declared using var, let, and const.

1. Types of Variable Declarations

- var: Old way, function-scoped, can be redeclared and updated.
- let: Modern, block-scoped, can be updated but not redeclared in the same scope.
- const: Modern, block-scoped, cannot be updated or redeclared.

2. Rules for Declaring Variables

- Variable names must start with a letter, $, or _.
  Valid: let name; let $price; let _total;
  Invalid: let 1name; let @value;

- Variable names can contain letters, digits, underscores, and dollar signs.
  Valid: let user1; let total_price;
  Invalid: let total price; let user-name;

- JavaScript variable names are case sensitive.
  Example: let name; let Name; // These are two different variables

JavaScript Variables - Complete Notes

- Reserved keywords cannot be used as variable names.

  Invalid: let let; let function; let return;

- Must declare variables before use.

  Invalid: x = 10; // creates a global variable implicitly (bad practice)

- const must be initialized when declared.

  const pi = 3.14; // Correct

  const pi; // Error

- let and const cannot be redeclared in the same scope.

  let age = 20;

  let age = 30; // Error

3. Variable Examples

```
let userName = "Alice";
console.log(userName); // Alice

let age = 25;
console.log(typeof age); // number

age = "twenty five";
console.log(typeof age); // string
```

JavaScript Variables - Complete Notes

```
const dob = "01-01-2000";

console.log(dob); // 01-01-2000



{

    let x = 10;

    console.log(x); // 10

}

// console.log(x); // Error: x is not defined



{

    var y = 20;

    console.log(y); // 20

}

console.log(y); // 20
```

4. Best Practices

- Use const by default unless reassignment is needed.
- Use let if the value will change.
- Avoid var in modern code.
- Use meaningful variable names (e.g., let userName, not let x).
- Follow camelCase naming convention.

Summary Table:

JavaScript Variables - Complete Notes

Keyword	Scope	Reassignable	Redeclarable	Hoisted	Use For
var	Function	Yes	Yes	Yes	Avoid in modern JavaScript
let	Block	Yes	No	Yes*	Values that may change
const	Block	No	No	Yes*	Fixed values/constants

* let and const are hoisted but not initialized.