Lesson 16: JavaScript Variables and Data Types

Introduction

- Introduction to JavaScript Variables and Data Types
- - In this lesson, we will cover:
    - What variables are
    - How to declare variables
    - Different data types in JavaScript

What is a Variable?

A variable is a container for storing data values.

Variables allow you to store and manipulate data in your programs.

Declaring Variables

In JavaScript, you can declare variables using `var`, `let`, or `const`.

```
var name = "John";
let age = 30;
const isStudent = true;
```

`var` Keyword

- `var` is function-scoped.
- Can be re-declared and updated.

```
var city = "New York";
var city = "Los Angeles"; // Re-declarat
city = "Chicago"; // Update is allowed
```

`let` Keyword

- `let` is block-scoped.
- Cannot be re-declared in the same scope but can be updated.

```
let country = "USA";
// let country = "Canada"; // Error: Ide
country = "Canada"; // Update is allowed
```

`const` Keyword

- `const` is block-scoped.
- Cannot be re-declared or updated.

```
const birthYear = 1990;
// birthYear = 1991; // Error: Assignmen
```

Data Types

- JavaScript has several data types:
  - Primitive types
  - Reference types

Primitive Data Types

- Primitive Data Types
- - Primitive data types include:
    - String
    - Number
    - Boolean
    - Null
    - Undefined
    - Symbol (ES6)

```
let name = "Alice"; // String
let age = 25; // Number
let isStudent = false; // Boolean
let address = null; // Null
let phone; // Undefined
let id = Symbol("id"); // Symbol
```

String

- Strings are used to represent text.
- Can be enclosed in single quotes, double quotes, or backticks.

```
let greeting = "Hello, World!";
let response = 'Hi there!';
let template = `Welcome, ${name}!`;
```

Number

- Numbers represent both integer and floating-point values.

```
let integer = 42;
let float = 3.14;
```

Boolean

- Booleans represent logical values: `true` or `false`.

```
let isActive = true;
let isComplete = false;
```

Null

- `null` represents the intentional absence of any object value.

```
let result = null;
```

Undefined

- `undefined` means a variable has been declared but not assigned a value.

```
let data;
console.log(data); // undefined
```

Symbol

- Symbols are unique and immutable primitive values.
- Used to create unique identifiers.

```
let sym1 = Symbol("key");
let sym2 = Symbol("key");
console.log(sym1 === sym2); // false
```

Reference Data Types

- Reference data types include:
    - Objects
    - Arrays
    - Functions

Object

- Objects are collections of key-value pairs.

```
let person = {
    name: "John",
    age: 30,
    isStudent: true
};
```

Array

- Arrays are ordered collections of values.

```
let numbers = [1, 2, 3, 4, 5];
let fruits = ["apple", "banana", "cherry
```

Function

- Functions are reusable blocks of code.

```
function greet(name) {
    return `Hello, ${name}!`;
}
```

Type Conversion

- JavaScript can convert data types automatically (type coercion) or manually.

```
let num = "123";
let convertedNum = Number(num); // Manua
let sum = num + 1; // Automatic conversi
```

Summary

- We covered:
  - Variables and how to declare them
  - Primitive and reference data types
  - Type conversion
- Practice using variables and data types in your own code.

Exercise

- Create a JavaScript program that:
  - Declares variables using `var`, `let`, and `const`
  - Uses different data types
  - Converts a string to a number and performs an arithmetic operation

Additional Resources

- Additional Resources
- - MDN Web Docs: JavaScript
  - JavaScript.info