**JavaScript Variables**

**Introduction to JavaScript Variables**

Variables in JavaScript are used to store data that can be accessed and manipulated throughout a program. They act as containers for data values.

**Declaring Variables**

Variables can be declared in JavaScript using three keywords: var, let, and const.

1. **var**: The oldest way to declare variables. var is function-scoped, meaning it is accessible within the function where it is declared.

1. **let**: Introduced in ES6, let is block-scoped, meaning it is only accessible within the block (e.g., { }) where it is declared.
2. **const**: Also introduced in ES6, const is used to declare variables whose values should not change. const is also block-scoped.

**Variable Naming Rules**

* Variable names must start with a letter underscore (\_) and dollar sign ($).
* Subsequent characters can be letters, digits, underscores and dollar signs.
* Variable names are case-sensitive.

**Types of Variables**

JavaScript is a dynamically typed language, meaning you don't need to specify the type of a variable when declaring it. The type is automatically assigned based on the value.

1. Number
2. String
3. Boolean
4. Array
5. Object
6. Undefined

**Examples of Variable Usage**

* Arithmetic Operations
* String Concatenation
* Working with Objects

**Scope of Variables**

* **Global Scope**: Variables declared outside any function have global scope.
* **Local Scope**: Variables declared within a function are local to that function.
* **Block Scope**: Variables declared with let or const within a block are only accessible within that block.

**JavaScript Data Types**

**Introduction**

JavaScript is a dynamic, loosely-typed programming language that uses different data types to manage various forms of data. Understanding these data types is fundamental to working effectively with JavaScript.

**2. Primitive Data Types**

Primitive data types are the simplest forms of data. They include:

**String**

* + Used to represent textual data.

**Number**

* + Represents both integer and floating-point numbers.

**Boolean**

* + Represents a logical entity and can have two values: true or false.

**Undefined**

* + A variable that has been declared but not assigned a value.

**Null**

* + Represents the intentional absence of any object value.

**Symbol**

* + Represents a unique and immutable identifier.

**Big Int**

* + Represents integers with arbitrary precision.

**3. Non-Primitive Data Types**

Non-primitive data types hold collections of values or more complex entities.

**Object**

* + A collection of properties, where each property is associated with a value.

**Array**

* + An ordered collection of values

**Function**

A block of code designed to perform a particular task.

**4. Type Conversion**

JavaScript allows the conversion of data from one type to another.

**Implicit Conversion**

**Explicit Conversion**

**5. Type Checking**

**Typeof Operator**

* + Used to determine the type of a variable.

**Instanceof Operator**

* + Used to check if an object is an instance of a particular class.