Module 8) JavaScript

Variables and Data Types

Question 1: What are variables in JavaScript?

Variables are containers for storing data values.You can declare variables using:

`var` (old, can be redeclared and has function scope),

`let` (block scope, cannot be redeclared),

`const` (block scope, cannot be changed after assignment).

Example:

javascript

```javascript
var x = 10;  // old way
let y = 20;  // modern, flexible
const z = 30; // value cannot change
```

Question 2: Different Data Types in JavaScript

JavaScript has the following data types:

1. **String**: Text data, e.g., `"Hello"`.
2. **Number**: Numeric data, e.g., `42` or `3.14`.
3. **Boolean**: Logical values, `true` or `false`.
4. **Undefined**: A variable without a value.
5. **Null**: Represents "nothing" or an empty value.
6. **Object**: A collection of key-value pairs, e.g., `{name: "John", age: 25}`.
7. **Array**: A list of items, e.g., `[1, 2, 3]`.

Example:

javascript

```javascript
let name = "Alice";  // String
let age = 25;        // Number
let isStudent = true; // Boolean
let city;            // Undefined
let noValue = null;  // Null
let person = { name: "Alice", age: 25 };  // Object
let numbers = [1, 2, 3];  // Array
```

Question 3: Difference between Undefined and Null

Undefined: A variable that has been declared but not assigned a value.
Example: `let x; console.log(x); // undefined`

Null: Represents an intentional absence of a value.
Example: `let y = null; console.log(y); // null`

Key Difference:

Undefined is JavaScript's default state for uninitialized variables.

Null is explicitly assigned to indicate "no value."