Variables and Data Types

Question 1: What are variables in JavaScript? How do you declare a variable using var, let, and const?

Ans.

A variable in JavaScript is a container used to store data values like numbers, text, or objects.

Example: Let name=”uday”

Let age=21

So,

name is a variable that stores the string "Uday".

age is a variable that stores the number 21.

Declare a variable using var, let, and const :-

There are **three keywords** used to declare variables:

1. var
2. let
3. const

1. Var :

   Var has function scope or global scope if declared outside a function. Var can be re-declared and updated. It should be avoided in modern JS because it can cause bugs due to scope issues.

   Example:
   ```
   var city = "Ahmedabad";
   city = "Surat";
   var city = "Rajkot";   (re-declared)
   ```

```
console.log(city);
```

2. Let :

   Let Has block scope only works inside { }. Let can be updated, but not redeclared in the same scope.

   Explain :

```
let fruit = "Apple";
fruit = "Banana";   (can update)
// let fruit = "Orange";   (but can't re-declared it print error)
console.log(fruit);
```

3. Const :

   Const has block scope like let. Const cannot be updated or redeclared**.** Must be initialized at the time of declaration.

   Explain :

```
const country = "India";
//country = "USA";    (it give error "Assignment to constant variable")
console.log(country);
```

Question 2: Explain the different data types in JavaScript. Provide examples for each.

Ans.

JavaScript has two main categories of data types :

1. Primitive Data Types
2. Non-Primitive Data Types

1. **Primitive Data Types :**

Primitive types are the basic building blocks of data in JavaScript. They store single values and are immutable cannot be changed directly.

a. String :

String used to store text sequence of characters. String written inside single ' ', double " ", or backticks ` `.

Example :

```
let name = "Uday";
let message = 'Hello World';
let greeting = `Hi, ${name}!`;
```

b. Number :

Used to store numeric values integers and decimals.

Example :

```
let age = 21;
let num=2.1;
```

c. Boolean :

Represents true or false values. used in conditions and logic.

Example :

```
Let name=true;
```

d. Undefined :

A variable declared but not assigned any value automatically becomes undefined.

Example :

```
let city;
console.log(city);
```

e. Null :

Represents intentional absence of a value.

Example :

```
let car = null;
console.log(car);
```

2. Non-Primitive Data Types :

These store collections of data or complex entities. They are stored by reference in memory.

a. Object :

Object is used to store data in key–value pairs.

Example :

```
let person = {
 name: "Uday", age: 21,  city: "Ahmedabad"
};
console.log(person.name);
```

b. Array :

Array is used to store multiple values in a single variable like ordered list.

example :

```
let colors = ["uday", "parmar", "rajkot"];
 console.log(colors[1]);
```

c. Function :

A block of code designed to perform a specific task.

Example :

```
function uday() {
 console.log("Hello, I am uday parmar");
}
uday();
```

Question 3: What is the difference between undefined and null in JavaScript?

Ans.

	Undefined	Null
Meaning	A variable has been declared but not assigned a value.	Represents an intentional absence of value.
Assigned by	JavaScript automatically assigns undefined to uninitialized variables	Programmer explicitly assigns null to indicate “no value”
Usage	Used by JavaScript internally when a variable is not initialized	Used by developers to reset or clear a variable’s value
Example	let a; console.log(a);	Let b = null; console.log(b); // null
Boolean Conversion	Boolean(undefined) → false	Boolean(null) → false

Equality (==)	undefined == null → true (they are loosely equal)	-
Strict Equality (===)	undefined === null → false (different types)	-

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