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JavaScript Practice

Data Types and Variables:

1. *What are the different data types used in JavaScript variables in the provided code?*

String:JavaScript strings are for storing and manipulating text.They are enclosed in single or double quotes

example in the code: *let sname = "John";*

Number (Integer, Float,double):Numbers store numeric values.Numbers can be written with, or without decimals. example in the code: *let bankBalance = 23.78;*

Array: collection of elements that that can hold items of any data type.JavaScript arrays are written with square brackets and items are separated by commas.example in the code:

let myRoom = ['bed', 'chair', 'gas cooker', 'table', 'tv'];

Boolean:Booleans can only have two values: true or false. example in the code:

let isAdmin = false;

let isPermitted = true;

Object: It is a collection of properties, and a property is an association between a name (or key) and a value.An object variable can contain all types of variables.Example in the code:

let countryInfo = { citizenShip: 'Kenyan', idNumber: 44455567 };

let info = { fname: 'Titus', sname: 'Kimutai', age: 23, isStudent: true, countryInfo, marks };

Undefined:In JavaScript, a variable without a value, has the value undefined. The type is also undefined. Example in the code:

let student;

console.log(typeof student);

Null: It reprints a variable without a value.

Example in the code:

let age = null;

console.log(age);

2. Explain the difference between var, let, and const in JavaScript.

- ❖ var: can be redeclared and updated, it can be reassigned.
- ❖ let: can be reassigned but not redeclared within the same scope.
- ❖ const: Cannot be redeclared or updated after its initial assignment.

3. Why does JavaScript allow assigning different data types to the same variable?

JavaScript is dynamically typed, allowing variables to change types during execution
example:

```
let name="urbanus"  
name=30  
console.log(name);
```

4. How does JavaScript handle variables declared but not initialized? Illustrate with an example from the code.

Uninitialized variables default to undefined

```
let student;  
console.log(typeof student);
```

 expected result will be undefined

5. Discuss the significance of variable names in programming and how they are used in JavaScript.

Variables are containers for storing data (storing data values). Meaningful names make code easier to understand and maintain.

Numeric Data Types:

What are the various numeric data types used in JavaScript, as shown in the code?

- Integers: let myKiswahiliMarks = 67;
- Floats/Doubles: let bankBalance = 23.78;
- Infinity: let yearsInHeaven = Infinity;

Explain the difference between integers, doubles, and Infinity in JavaScript with examples.

- Integers: Whole numbers (e.g., 67).
- Doubles/Floats: Numbers with decimal points (e.g., 23.78).
- Infinity: A special value representing a number larger than any other number.

How does JavaScript handle arithmetic operations involving different numeric data types?

Arithmetic operators perform arithmetic on numbers (literals or variables). JavaScript can handle operations involving integers, floats, and Infinity correctly.

example: let result= 200+300;

*let salary= 200.60*300.909;*

let division= 200/300;

let minus= 500-300;

String Data Type:

How are strings represented in JavaScript?

A JavaScript string is zero or more characters written inside quotes. They are enclosed in single (') or double (") quotes.

example: *let name= "Amos"*

Discuss the difference between declaring strings with single quotes (') and double quotes (") in JavaScript.

There is no functional difference. Both single and double quotes in JS perform the same task.

example: *let name= "Amos"* output //Amos

example: *let name= 'Amos'* output //Amos

Explain why characters are automatically treated as strings in JavaScript.

Characters in quotes are treated as strings, regardless of length. So as far as they are enclosed in quotes, they will be treated as string.

Boolean and Undefined Data Types:

Explain the purpose of boolean variables in JavaScript.

A JavaScript Boolean represents one of two values: true or false. These logical states (true or false) are useful in conditions.

Discuss the concept of undefined in JavaScript variables and provide examples from the code.

A variable that is declared but not initialized

let student;
console.log(typeof student); expected result will be undefined

How are boolean variables useful in conditional statements and control flow in JavaScript?

Booleans control logic in if-else blocks.

example:

let isAdmin=true
if(isAdmin){.....}

Null Data Type:22

Describe the significance of the null value in JavaScript?

Represents intentional absence of a value

Differentiate between null and undefined in JavaScript.

- null: Explicitly set to indicate no value.
- undefined: Variable declared but not assigned.

Provide an example from the code illustrating the use of null.

let age = null;
console.log("age");-----expected to output null

Object Data Type:

Explain how objects are represented in JavaScript.

Objects store key and value pairs. they are created by using {} symbol.

example: *const vehicle= {type:"Honda", model:"500", color:"white"};*
type,model,color are keys while Honda,500,white are the values.

example: *let countryInfo = { citizenShip: 'Kenyan', idNumber: 44455567 };*
citizenShip, idNumber are keys while Kenyan and 44455567 are values

Discuss the structure and purpose of the countryInfo object in the provided code.

This object holds information about a person's citizenship and ID. Its structure makes it contain many values

How can objects be nested within other objects in JavaScript?

Objects can contain other objects or arrays.

example: `let info = { fname: 'Titus', countryInfo };`

Array Data Type:

Describe the purpose and structure of arrays in JavaScript.

An array is a special variable, which can hold more than one value. Arrays hold lists of elements.

example: `let marks=[23,56,89,80,65,34];`

`let myRoom = ['bed', 'chair', 'gas cooker', 'table', 'tv'];`

Provide examples from the code demonstrating arrays containing different data types.

`let moreInfo = [countryInfo, marks];`

Discuss the concept of "array of arrays" and its significance.

Arrays can contain multiple arrays, making us handle complex or large volumes of the same data efficiently.

Variable Naming Conventions:

What are the conventions for naming variables in JavaScript?

Conventions:

- Use camelCase for variable names (e.g., firstName, lastLoginDate).
- Start with a letter, underscore, or dollar sign.
- Be descriptive but concise.
- Avoid reserved keywords.

Discuss the importance of choosing meaningful and descriptive variable names.

Good naming conventions improve code readability and maintainability.

Identify any variable naming conventions followed or violated in the provided code.

Variable names like myRoom, countryInfo follow conventions. Names like first_name violate the camelCase convention.

Constants in JavaScript:

Explain the use of const keyword in JavaScript.

Constants hold values that should not change as Variables defined with const cannot be Redeclared and cannot be Reassigned.

Discuss why reassigning a value to a constant variable result in an error.

const in JavaScript throws an error if a constant is reassigned as variable defined with const cannot change in future.

Provide examples from the code demonstrating the declaration and use of constants.

example: *const phoneNumber = 254789567364;*

// phoneNumber = 12345; // This would throw an error