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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 reprents a variable without a value.  
  
Example in the code:  
*let age = null;  
console.log(age);*

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

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

1. ***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);*
2. ***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
3. ***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).avaScript can handle operations involving integers, floats, and Infinity correctly.

*example: let result= 200+300;*

*let salaryt= 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.***

Their is no functional difference.Both single and double quotes in js perform the same task.  
example: *let name=“Amos”* output //Amosexample: *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 qoutes, 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. This 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.It’s structure makes it contain many values

***How can objects be nested within other objects in JavaScript?***Objects can contain other objects or arrays.

example: l*et 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.

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# 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