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**Assignment 2 Javascript**

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1. **Data Types and Variables**:

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

Answer:

-String -Number -Boolean -Object -Undefined -Null -Array

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

Answer:

**let** is used for declaring variables that can later on be reassigned, **const** is used to declare variables that cannot be changed once assigned and **var** is an old and outdated way that can be used for creation of variables.

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

Answer:  
Javascript comes with automatic type coercion, allowing one variable to be assigned different data types, offering more flexibility and allowing value of a variable to be changed during program execution.

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

Answer:

When a variable is declared but not initialized in Javascript, it is given the value **unassigned.**

**Eg** given the code snippet below;

**let name;**

**console.log(name); //**output will be unassigned

And from the code:  
 let student;

console.log(typeof student); // Output: undefined

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

Answer:

Variable names allow creation of readable code which convey the purpose of the variables and their usage, making code easy to understand and interpreted.  
To use variable names effectively, one must take into consideration the following:

* Variable names should use camelCase
* They should begin with a small letter, underscore or dollar sign
* They should not begin with a number during naming
* Variable names should not be reserved words

1. Numeric Data Types:

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

-Answer:

-Integer -Float -Double -BigInt -Infinity

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

Answer:

Integers are basically whole numbers without decimals, doubles are used for storing numbers with decimal points with 64 bit precision while infinity represents an infinite value.

Eg

let num1 = 10 // this is an integer

let num2 = 676.67 // this is a double

let num3 = 20 / 0 //this is infinity

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

Answer:

Javascript does these type of operations by performing type coercion, involving trying to convert both values for the arithmetic operation to a common number type. If not, it does coercion, which involves joining the values involved together.

1. String Data Type:

* How are strings represented in JavaScript?

Answer:

Strings in Javascript are represented by enclosing them in template literals(` `), using single quotes (‘ ‘) or through the use of double quotes(“ “)

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

Answer:

There is no major difference between using the two when declaring strings, as they achieve the same goal, which is declaring the string.

* Explain why characters are automatically treated as strings in JavaScript.

Answer:

When declaring characters in javascript, they are initialized with the single quotes(‘ ‘) which is similar to how strings are initialized, hence being interpreted as the same by Javascript(since there is no unique data type for characters)

1. **Boolean and Undefined Data Types**:

* Explain the purpose of boolean variables in JavaScript.

Answer:

Boolean variables allow representation of two possible values: true or false, and are useful in testing different conditions in Javascript.

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

Answer:   
undefined in javascript is when a variable is declared but never initialized therefore given this value.

Eg from the code:

let student;

console.log(student); //output will be undefined

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

Answer:

They are useful for determining whether a given condition is true or false which then decides if some given piece of code is executed or not.

1. **Null Data Type**:

* Describe the significance of the null value in JavaScript.

Answer:

Null represents that there is no value for a given variable.

* Differentiate between null and undefined in JavaScript.

Answer:

Null is used to represent the intentional absence of a value while undefined indicates that a variable has been declared but was not assigned a value.

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

Code segment:  
let age = null;

console.log(age); // Output: null

1. Object Data Type:

* Explain how objects are represented in JavaScript.

Answer:

Objects are collections of key-value pairs. Keys are strings, and values can be of any type.

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

Answer:

The countryInfo object stores data related to a person’s citizenship and ID number.

* How can objects be nested within other objects in JavaScript?

Answer:

Objects can be nested by assigning one object as a value within another object.

Example:

let info = { fname: 'Titus',

countryInfo, marks };

1. Array Data Type:

* Describe the purpose and structure of arrays in JavaScript.

Answer:

Arrays are used to store ordered collections of data, usually of the same type, which can be accessed using indices.

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

Answer:

Example:

let moreInfo = [countryInfo, marks, info];

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

Answer:

This concept, “array of arrays” is when arrays can contain other arrays, allowing for complex data structures.

1. Variable Naming Conventions:

* What are the conventions for naming variables in JavaScript?

Answer:

Variables should:

Start with a letter, underscore, or dollar sign.

Be descriptive and meaningful.

Follow camelCase convention (e.g., let myName).

* Discuss the importance of choosing meaningful and descriptive variable names.

Answer:

Descriptive variable names improve code readability and maintainability, allowing other developers to understand the code's purpose easily.

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

camelCase: Variables like myKiswahiliMarks, countryInfo variables within the code segment provided.

1. Constants in JavaScript:

* Explain the use of const keyword in JavaScript.

const is used to declare variables whose values cannot be reassigned.

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

Once a constant variable is assigned, it cannot be changed. Attempting to do so will throw an error.