1. **Data Types and Variables**
2. Data Types in JavaScript

* String
* Boolean
* Numbers
* undefined

1. Difference between var, let, and const

* var - cannot be redefined
* let - can be redefined
* const- it is fixed, cannot be reassigned

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

It will not erase the previous space but relocate the new value to another space

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

let age

console.log(age)

result = undefined

When you declare a variable with var it is hoisted and initialized in the memory as undefined b4 the code execution.

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

Variables names serve as identifies for storing data values.

They improve code reliability and maintenance

1. **Numeric Data Types**
2. Numeric data types used in JavaScript

* Integers
* Float numbers

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

Integers are whole numbers while Doubles are numbers with decimals and Infinity are special values representing infinity.

// Integers

let a = 10;

// Doubles

let b = 123.4568;

// Infinity

console.log (1/0);

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

It automatically handles operations between different numeric types by converting the operands as needed.

1. **String Data Type**
2. How are strings represented in JavaScript?

Add double or single quotes in a sentence.

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

It depends on coding style preferences and conventions.

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

JavaScript doesn't have a separate char type. so, individuals’ characters are considered strings of length 1

1. **Boolean and Undefined Data Types**
2. Explain the purpose of Boolean variables in JavaScript

They help us make decision based on True or False

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

Variables that are declared but not initialized

let age

console.log(age);

1. How are Boolean variables useful in conditional statements and control flow in JavaScript?

They are used to control the flow of programs by evaluating conditions

1. **Null Data Type**
2. Describe the significance of the null value in JavaScript

It is used when we want a variable to be empty

1. Differentiate between null and undefined in JavaScript

Null is empty value while undefined is a variable that is declared but not assigned

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

let name = null;

console.log(name);

1. **Object Data Type**
2. Explain how objects are represented in JavaScript

There are represented as a collection of property which is an association between a key and a value.

1. Discuss the structure and purpose of the country Info object in the provided code.

How can objects be nested within other objects in JavaScript?

let city = {

name: "Kimathi",

population: 40, 000, 000,

country: {

name: "Kenya",

continent: "East Africa"

};

};

1. **Array Data Type**
2. Describe the purpose and structure of arrays in JavaScript

They are used to store multiple values in a single variable of different data types.

DataType ArrayName = [number, float, string, Boolean];

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

let mixedArray = [1, "Hello World", 23.4, false];

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

It is used to store grid like data

let matrix = [[9,8], [7,6], [5,4], [3,2]];

1. **Variable Naming Conventions**
2. What are the conventions for naming variables in JavaScript?

Avoid reserved key words

Start with a letter, underscore or dollar sign.

Be written in camelCase

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

They improve code readability and make maintenance easier. They should reflect the data or purpose they represent.

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

Code starting with numbers, inappropriate characters or unclear name

1. **Constants in JavaScript**
2. Explain the use of const keyword in JavaScript.

It is used to declare variables that remain constant throughout the program

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

Constants are meant to hold values that cannot change after declaration

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

const PI = 3.14159;

PI = 3.14 // error