**Javascript:-**

**“**JavaScript is a high-level, interpreted programming language primarily used to create interactive and dynamic content on web pages. It allows developers to manipulate the Document Object Model (DOM), handle events, and communicate with servers, enabling rich user experiences in web applications**.”**

**First program:** console.log("This is the first program.");

**Client-Side and Server-Side**:-

“JavaScript is primarily known for its role in client-side development, where it runs in the browser to create interactive web pages. However, with the advent of Node.js, JavaScript can also be used on the server side to build scalable network applications”.

**JavaScript Syntax:-**

“Just we follow some rules while speaking english (The grammer) , we have some rules to follow while writing javascript program. The set of these rules is called Syntax in JavaScript”.

**Variable:-**

“Variable is like a container that store a value . These is very similer to continue used to store Rice,Waer and Oat (*Treat this is an analogy*)”

* The value of a variable in JavaScript can be changed during exicution of a program.

**Rules to write a Variable name:**-

* Letters, Digits, Underscores and Doller “$” sign are allowed.
* Must began with a $, \_ , letter .
* JavaScript reserved words cannot be use as a variable name (var etc).
* Sahir and saHir are different variables ( Case sensitive ). don’t use variable name like this because it pronouns same then it will become a problem to

to understand some other.

let a= 313 // here "a" is a variable

console.log(a);

let $name = "Ali";

console.log($name);

**Var vs Let in JavaScript:-**

* Var is normally scoped while Let and Const are block scoped.
* Var can be updated and re-declared within its scope.
* Let can be updated but not declared .
* Const can neither be declare nor updated.

**Primitive Data Types:-**

“In JavaScript, primitive data types are the basic, built-in data types that are not objects. They are the fundamental building blocks of data in JavaScript.”

There are 7 primitive data types in JavaScript:

N=>Null

N=>Number

S=>String

S=>Symbol

B=>Boolean

B=>Bigint

U=>Undefined

1. Number: represents a numeric value, e.g., 42, 3.14

2. String: represents a sequence of characters, e.g., "hello", 'hello'

3. Boolean: represents a logical value, either true or false

4. Null: represents the absence of any object value

5. Undefined: represents an uninitialized or non-existent variable e.g only a,b,h,etc that are not the value of any other , that are not represent as a value .

6. Symbol: represents a unique identifier, introduced in ECMAScript 2015 (ES6)

7. BigInt: represents a large integer, introduced in ECMAScript 2020 (ES11)

**Primitive data types have the following characteristics:**

- They are immutable (cannot be changed once created)

- They are not objects (do not have properties or methods)

- They are compared by value (not by reference)

- They are stored in memory as a single value (not as an object reference)

In contrast, non-primitive data types in JavaScript are objects, such as arrays, functions, and user-defined objects.

<=**Practical Work=>**

// NN BB SS U

let a=null; //null

let b=345 //number

let c=true; //boolean

let d=BigInt("567") //Bigint

let e="Sahirullah"; //String

let f=Symbol("I am a nice symbol") //Symbole

let g=undefined; // undefined

console.log(a,b,c,d,e,f,g)

//we can add BigInt like this

let k= BigInt("12") + BigInt("13")

console.log(k)

How to make sure that the type of data is this e.g srting,Boolean,BigInt etc?

//to find the nature of data type

let k= BigInt("12") + BigInt("13")

console.log(typeof k)

**Non-Primitive:-**

“In JavaScript, non-primitive data types are complex data types that are not fundamental building blocks of data, but rather constructed from primitive data types. They are objects that have properties and methods, and are used to represent more complex data structures”.

Examples of non-primitive data types in JavaScript include:

1. Object: a collection of key-value pairs, e.g., { name: 'John', age: 30 }

2. Array: an ordered collection of values, e.g., [1, 2, 3], ['a', 'b', 'c']

3. Function: a block of code that can be executed, e.g., function greet() { console.log('Hello!'); }

4. Date: represents a date and time, e.g., new Date('2022-01-01')

5. RegExp: represents a regular expression, e.g., /pattern/g

6. Error: represents an error object, e.g., new Error('Something went wrong')

7. Map: a collection of key-value pairs, e.g., new Map([['key', 'value']])

8. Set: a collection of unique values, e.g., new Set([1, 2, 3])

9. WeakMap: a collection of key-value pairs with weak references, e.g., new WeakMap()

10. WeakSet: a collection of weakly referenced objects, e.g., new WeakSet()

**Non-primitive data types have the following characteristics:**

- They are mutable (can be changed after creation)

- They are objects (have properties and methods)

- They are compared by reference (not by value)

- They are stored in memory as an object reference (not as a single value)

In contrast, primitive data types in JavaScript are the basic, built-in data types that are not objects, such as numbers, strings, booleans, etc.

**<=Practical Work=>**

//object in js

const item = {

    "Sahir": true,

    "Sajid": false,

    "Usman": 313,

    "Zaki": undefined

}

console.log(item["Sahir"])

/\*it we give a vaule that is

not defined here in this object

then it will give us undefined.\*/

**EXERCISE NO #01:**

//Q:01:- Creat a variable of type string and try to add a number to it?

let a ="Sahir"

let b = 313

console.log(a+b)

//Q:02:- Use tpe of operator to find the datatype of the string  in 1st question?

let a ="Sahir"

let b =313

console.log(typeof (a+a))

//Q:03:- Creat a const object in javascript  can you chang it to hold a number letter?

cont a1={

             name: "Sahir"

             section: 1,

             isprincipal: false

}

a1=45

/\*we have writ a complet statement which is given in the but it is not possible to hold a

number , we cann't assign a number. So it will give a syntax error.\*/

//Q:04:- Try to add a new key to the const object  in "Question 03" were you able to do it?

const a1= {

    name:"Sahir"

    Section:1,

    isprincipal:false

}

a1['friend']= "Sahir"

a1['name']="Usman"

console.log(a1)

//for a1 we cann't make a new a object. because it is a constant it is refrence for objects.

//Q:05:- Write a program  to create a word meaning dictionary  of 5 words?

const dict = {

   Appreciate:"recognize the full worth",

   atarxia:"a state of frrdom.",

   Yakka:"work,Especially hard work.",

   Away:"at the distance",

   Speak:"Talk to someone",

}

console.log(dict.Speak)

//we can also write like(dict['Speak'])

MCQs

var a=7; // here is 7 and 5 are oprand

var b=5;

var c=a+b; // “+” is a operator

cosole.log(c)

output 12// the 12 is a result