**JAVASCRIPT**

JavaScript is a scripting language; the scripts are present in HTML pages, and they run on any devices that has a JavaScript engine. It was created to make web pages alive.

The browser has embedded engine called ‘JavaScript Virtual Machine’.

It is used for client-side validation purposes.

**How do engines works:**

* The engines reads scripts.
* Then scripts are converted to machine code.
* And then machine code runs.

There are two ways to add JavaScript(JS) in HTML page; they are internal JS by using <script> tag, and other way is external JS file linking using <script> tag with providing the path of the file to source(src) attribute. It can be inserted anywhere in the HTML page. Within the <head> tag or within the <body> tag.

VARIABLES:

Variables are like a container which are used to store the data or information in it. There are three ways to declare a variable in JS by using var, let, and const keywords.

We can’t declare variable names to pre-defined keywords of JS. We can reassign variable value to any type of value as many times as we want. But constant variables can’t be re-initialized.

DATATYPES:

Datatypes tells what type of data stored in the variable. There are Eight datatypes

in JavaScript. JavaScript is dynamically typed language it means we can change the type of data stored in various. Datatypes are: number, null, string, symbol, Boolean, BigInt, and undefined are called primitive types because they can contain only single value.

Objects: Objects are special datatypes used to store collections of data.

typeOf operator or typeOf() is used to check what type of data is stored in a variable.

Seven primitive datatypes:

1. number: to store numbers of any kind integer or floating numbers.
2. null: if value of the variable is unknown then use null type. The typeOf null basically shows object not null.
3. bigint: to store numerical values with arbitrary length.
4. string: to sequence of characters of any length.
5. boolean: used for storing true/false values.
6. undefined: if variable declared but not assigned any value then is undefined.
7. symbol: used for unique identifiers.

INTERACTION:

The interaction functions are useful for interaction with user. Interaction functions are alert(), prompt(), and confirm().

Alert: The alert is used to show messages to the user. The mini window with message is called modal window. The modal window is because the user can’t interact with rest of the page until respond to the mini window.

Prompt: The prompt is an interaction function used to take the input from the user. It takes two arguments title of the prompt function and second one is optional default value. Any values that are read from the user using prompt is usually in string type.

Confirm: The confirm interaction function is used to take decision. It shows two buttons OK and Cancel. The result is true if OK is pressed and false if Cancel is pressed.

FUNCTIONS:

Functions are the main building blocks of the program. Functions allow the task to be done repeatedly without repeating the code. Functions are used to perform specific task.

There are two types of functions are there built in functions and user defined functions. Functions declaration looks like:

function functionName(){

Statements…..

}

ARROW FUNCTIONS:

Arrow functions are very simple, concise, and shorter version of function expressions. Function declaration looks like a function expression.

let functionName = (arg1, arg2,,,argN) => {

Expression;

}

If arrow function has a single parameter, then parenthesis can be omitted, but if doesn’t have any parameters then parenthesis are must.

If arrow function has only one expression, then curly braces are optional, but if contains multiple expressions then it is necessary and return statement is also mandatory.

OBJECTS:

In JavaScript there are Eight data types are present, from that Seven are primitives and one is an Object. Objects are used to store keyed collections of various data like complex data. Usually, objects are used to store multiple properties. Each property is identified as key value pair, where key is a string and value can be anything. Empty object can be created in two ways:

let user = new Object(); // object constructor

let user = {} //object literal

the properties of the objects can be added and removed at any time. Properties are accessible through dot(.) operator.

If a property key has a multiword then it should be quoted. To access multiword property dot operator doesn’t work we need to use square brackets [] to access.

To check whether the property exist or not by using access method or by using “in” keyword. If exist, then returns otherwise returns undefined.

“key” in objectName;

To iterate over the object we use for..in loop.

for(ley key in objectName){

expression…

}

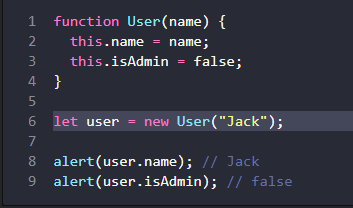
The Object is a non-primitive it supports only string and symbol primitive types as keys of the object, for instance if we use number as the key of the object then it auto converts to sting or symbol types.

Ex: obj[1] is same as obj[“1”].

GARBAGE COLLECTION:

Memory management in JavaScript is performed automatically and invisibly to us. There is a background process in the JavaScript engine called Garbage Collector. It monitors all the objects and removes the objects that are not reachable.

The regular object creation syntax will allow us to create one object if we want to create multiple objects then object’s constructor method and new operator is used.



SYMBOLS:

Symbol is a primitive unique value which represents a unique identifier. It is created using Symbol(). It may have optional symbol description also called symbol name.

Ex: let id = Symbol(“id”);

Here id is a unique symbol identifier whereas the value inside the Symbol() is the symbol description or name. Two or more symbols have same description but unique identifier. Two symbols are not equal even though they have the same description.

Symbols don’t auto convert to string. If we want then have access using toString() method, and if want only description then description identifier.

Ex: alert(id.toString()); //for symbol with description

alert(id.description); //for description only.

ARRAYS:

Array is used to store or collection of more than one element. Array is an index based, if want to access an element from the array then array index is used. In array we can store any type of elements. Arrays is a object, where the number or index of the array is key. There are two ways to create an array:

1. let array = new Array();
2. let array = [];

in other programming languages if want to access last element then negative index is used but in JavaScript it doesn’t work.

To find length of the array then we use length.

Array has some of the built in methods to work like push() is used to add element to the end of the array, pop() is used to remove element from the end and returns it, shift() is used to remove element from the beginning and returns it, and unshift() is used to add element to the beginning of the array.

Array find() is used to find the element from the array, but it returns only single that is first element of the array. If the array contains more similar elements, then we have go for filter() method.

Also, as methods like sort to sort elements of the array, reverse() for reversing the array.