Variables & Data types

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JavaScript

- ★ Introduction
- ★ JS Basics
- ★ Variables
- ★ Data types

Web Page

HTML
Content & Structure

Headings,
Paragraphs
Lists

CSS
Presentation

Font
Color
Background color
Border

JavaScript
Behavior

dynamic display
widgets
user iteraction
click to open a popup

JS History

Invented by Brendan Eich in 1995 in 10 days Initial name is LiveScript

It became a ECMA standard in 1997

JavaScript is open source

ECMA - European Computer Manufacturers Association

ES Versions

ECMAScript is the official name of the language

Official Name	Version	
ES1	ECMAScript 1 (1997)	First Edition
ES2	ECMAScript 2 (1998)	
...		
...		
ES6	ECMAScript 6 (2015)	This is major release

How to include JavaScript file in html code

1. Using <script> tag

2. External file using <script> tag with src attribute

JS Engine

A JavaScript engine is a software component that executes JavaScript code.

Engine Name:

- Google Chrome → V8
- Firefox → SpiderMonkey
- Edge (Internet Explorer) → Chakra
- Safari → JavaScript Core Webkit

What is Node.js

Nodejs is an open source runtime environment that runs on the google chrome V8 engine to execute JavaScript code outside a web browser

Ryan Dahl developed a node.js in 2009

On the same year npm was also launched to give super power

Npm- Node package manager

Nodejs installation

https://nodejs.org/en/download/

Check using commands

node -v

npm –v

Today's Assignment

- Create the repository with name 'JavaScript_Learning' in gitHub and clone it please on local system.
- Install the Nodejs from link https://nodejs.org/en/download/
  - Execute below commands on command prompt one by one
  - node -v
  - npm –v

What is JavaScript?

JS Open source scripting language

- It is a light weight
- JS allows client side script to interact with user
- It is interpreted programming language
- Object oriented capabilities

Merits of JS

- Less Server Interaction
- Immediate feedback to the visitors
- Richer Interface
- Handle Operation with multiple events

JS Limitations

Limitations of JS

- No Multithreading capabilities
- Client side script does not allow reading or writing of files
- Less secure as compared to java and few other languages

JS Using style

- <script> tag in html
- JS in External file
- Plain file with .js extension

JavaScript Basic

- File extension

- White space and line breaks
- Semicolons are optional
- Case Sensitivity
- Comments:
  - Single Line (//)
  - Multi-line (/* */)

Console Object

The console object is a property of the window object.

The console object provides access to the browser's debugging console.

The console object is accessed just console

Console Object Methods

log(): Outputs a message to the console

info(): Outputs an informational message to the console

warn(): Outputs a warning message to the console

error(): Outputs an error message to the console

trace(): Outputs a stack trace to the console

clear(): Clears the console

table(): Displays tabular data as a table

time(): Starts a time means can track how long an operation takes

timeEnd(): Stops the times timer that was previously started by console.time()

Container

Container with one fruit

Two different Containers with two different fruit

Variable in JavaScript

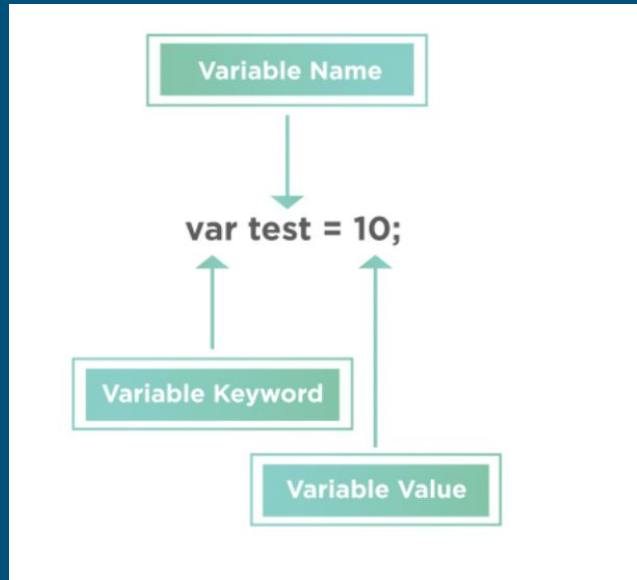Variables can be thought of as named containers. Which can store value.

Or we could say Variables are just the name of the storage location

- Variable Declaration: keyword 'var'

- Variable Initialization

- Variable declaration and initialization

var myNname; // Variable declaration

myNname = "Billgates"; // Variable Initialization

var age = 31; // Variable declaration & Initialization

Note: We can change the variable value as many times as we want

Naming Convention Rules:

Camel Case

- Name must start with a letter (a to z or A to Z), underscore(_), or dollar($) sign

- After first letter we can use digits (0 to 9)

- JavaScript variables are case sensitive, for example x and X are different variables.

- Reserved keywords are not allowed to use variable names

Reserved keywords

abstract	else	instanceof	switch
boolean	enum	int	synchronized
break	export	interface	this
byte	extends	long	throw
case	false	native	throws
catch	final	new	transient
char	finally	null	true
class	float	package	try
const	for	private	typeof
continue	function	protected	var
debugger	goto	public	void
default	if	return	volatile
delete	implements	short	while
do	import	static	with
double	in	super	

Assignments 01: Create a file → 01_variable_assign.js

1. Declare a variable with name → myFullName
   - Log the variable value myFullName value before initialization on console
   - Initialize the myFullName with your first and last name only. Log the value on console
   - Update the myFullName variable and with your first name, middle name and last name. Log the updated value on console
2. Declare and initialize a variable with name 'myLove' with value → "I love only JS" and log result on console
3. Create a variable for form controls as listed below . Declare and initialize must be on same line
   - firstName
   - lastName
   - age
   - address
   - pincode
   - gender
   - isMarried

   Note: log result on console of each variable. Only share the output and not the code please

Assignments 01: Create a file: 02_variableBasicsAssig.js for Variables and null vs undefined

1. Create 3 variables for each data types like number, String, Boolean
   Also check their data types and log on console in the format such as.

   Example:
   var PIN = 411056;
   Console output → PIN: 411056, type: number

2. Difference between null vs undefined and log on console

Assignments 02: Create a file→ 03_typeOf.js, Variable, data type and typeof operator

Create a variable like below

1. Declare variable bankName and assign value 'SBI Bank' separately also log value on console before and after initialization along with it's data type using typeof operator.

2. On the same line Declare and initialize a variable with name marks = '90%'   Log it's datatype and value on console using typeof operator.

3. Declare and initialize a variable separately isWorking with true but log value before and after initialization on console.

4. Declare and initialize a variable on same line as totalCount= "Hundred and Seven",
   a. Log the value on console as it is along with it's data type
   b. Update variable totalCount with new value totalCount=107, Log the value and it's data type on console

Assignments 03: Create a file → 02_swapVariables.js

1. Swap two variable values using third variable and Log variable values before and after swap
    a. Variable with name sweety and it's value "Sweety"
    b. Variable with name cutie and it's value "Cutie"

2. Swap three variable values [num1 = 100 , num2 = 200, num3 = 300] using 3rd variable;

    a. Swap variables values like 1st with 2nd, 2nd with 3rd and 3rd with 1st]
        Note: Log variable values before and after swap
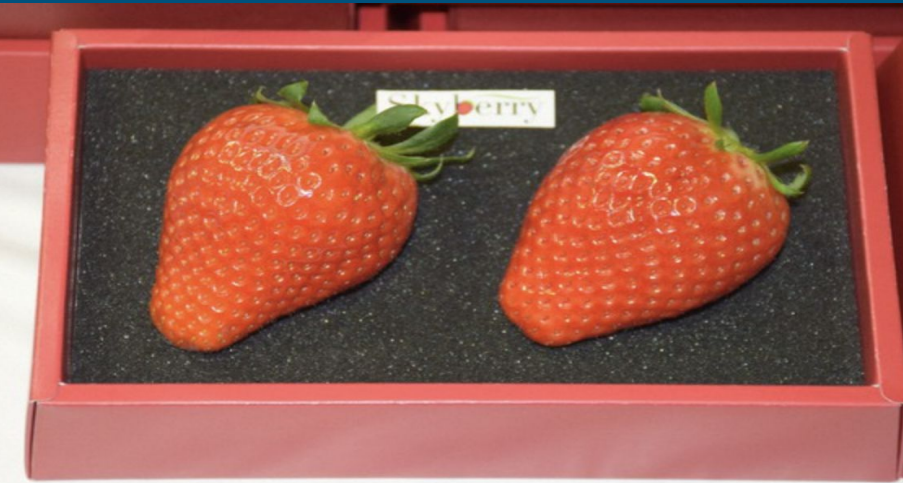
Questions - Variables in JS

- What are Variables in JavaScript?

- How to define, declare and initialize a variable in JavaScript?

- How to declare and initialize the variable together?

- How to access a JavaScript Variable?

- What is the Scope of Variables in JavaScript?

- How to re-declare variables in JavaScript?

- What are the rules for Variable Naming conventions in JavaScript?

- Procedure to define multiple variables in a single step in JavaScript?

Container

Container with one fruit

One Container with multiple fruits

Loosely typed

- JavaScript is a loosely typed language, meaning you don't have to specify what type of information will be stored in a variable in advance.

- This means that the same variable can be used to hold different data types.

strongly typed language

- Many other languages, like Java, require you to declare a variable's type, such as int, float, boolean, or String

Data types

JS provides different types of data types to hold different type of values

There are three main categories:

1. Primitive data type

2. Special data type or Trivial data types

3. Non Primitive data type or Reference data type or Composite data type

Data types

Primitive data type

Primitive data type can hold only one type of data

Number
- Represents a number like integer or floating
- All numbers in JavaScript are represented as floating-point values.

Boolean
- Represents logical entity true or false

String
- Represents a sequence of character
- "" Or '' used to represent string

Special data type

null
- A null value means that there is no value
- It is not equivalent to an empty string ("") or 0, it is simply nothing

undefined
- When a variable is declare and not assigned any value then it is undefined.

Reference data type

non-primitive data types can hold different types of data as a collection

object
- Object is also a named container which can hold multiple values
- Object is collection of properties and methods
- Three ways to create Objects. 1. Using literals, 2. Using Class and 3. Function constructor

Array
- An array is a type of object used for storing multiple values in a single variable
- Each value in an array has a numeric position, known as its index and it starts from 0
- Array can contain data of any data type-numbers, strings, booleans, functions, objects, and even other arrays

typeof operator

typeof operator is used to find data type of any variable

Syntax:

    typeof value;   or typeof(value)

      or

    typeof variableName; or typeof(variableName)

Thank you