Variables

--------------------------------------------------------

Declare variables for the following:

Your full name.

Your age.

Declare four variables without assigning values

Declare four variables with assigning values

Declare variables to store your first name, last name, marital status, country and age in multiple lines

Declare variables to store your first name, last name, marital status, country and age in a single line

Declare two variables \_myAge\_ and \_yourAge\_ and assign them initial values and log to browser console.

Output:

```sh

I am 25 years old.

You are 30 years old.

``

**// Declaring variables for full name and age**

**let fullName = "John Doe";**

**let age = 25;**

**// Declaring four variables without assigning values**

**let var1;**

**let var2;**

**let var3;**

**let var4;**

**// Declaring four variables with assigned values**

**let city = "Udupi";**

**let country = "India";**

**let isMarried = false;**

**let profession = "Developer";**

**// Declaring variables in multiple lines**

**let firstName = "John";**

**let lastName = "Doe";**

**let maritalStatus = "Single";**

**let nationality = "Indian";**

**let myAge = 25;**

**// Declaring variables in a single line**

**let fName = "John", lName = "Doe", mStatus = "Single", nation = "Indian", ageYears = 25;**

**// Declaring and assigning values to \_myAge\_ and \_yourAge\_**

**let \_myAge\_ = 25;**

**let \_yourAge\_ = 30;**

**// Logging the output to the browser console**

**console.log(`I am ${\_myAge\_} years old.`);**

**console.log(`You are ${\_yourAge\_} years old.`);**

Constant

------------------------------------------------------------------------------

Declare a variable using var, let, and const, and log their initial values to the console.

Try reassigning values to each variable.

What happens with const?

Try redeclaring each variable in the same scope.

Observe the behavior of var, let, and const.

**// Declare variables**

**var x = 10;**

**let y = 20;**

**const z = 30;**

**// Log initial values**

**console.log("Initial values:");**

**console.log("var x:", x);**

**console.log("let y:", y);**

**console.log("const z:", z);**

**// Try reassigning values**

**x = 100;**

**y = 200;**

**console.log("\nAfter reassignment:");**

**console.log("var x:", x);**

**console.log("let y:", y);**

**// Attempt to reassign const**

**try {**

**z = 300;**

**} catch (error) {**

**console.log("\nError when reassigning const z:", error.message);**

**}**

**// Try redeclaring each variable in the same scope**

**try {**

**var x = 500; // No error**

**console.log("\nRedeclared var x:", x);**

**} catch (error) {**

**console.log("Error when redeclaring var x:", error.message);**

**}**

**try {**

**let y = 600; // Error**

**} catch (error) {**

**console.log("Error when redeclaring let y:", error.message);**

**}**

**try {**

**const z = 700; // Error**

**} catch (error) {**

**console.log("Error when redeclaring const z:", error.message);**

**}**

Data Types

--------------------------------------------------------------------------

Declare variables and assign string, boolean, undefined and null data types

Whether you are a student (true/false).

Log the values and their types to the console using typeof.

**// Declare variables with different data types**

**let name = "Alice"; // String**

**let isStudent = true; // Boolean**

**let age; // Undefined**

**let score = null; // Null**

**// Log values and their types**

**console.log("Value of name:", name, "| Type:", typeof name);**

**console.log("Value of isStudent:", isStudent, "| Type:", typeof isStudent);**

**console.log("Value of age:", age, "| Type:", typeof age);**

**console.log("Value of score:", score, "| Type:", typeof score);**

Comments

--------------------------------------------------------------------

Write a single line comment which says, \_comments can make code readable\_

Write a multiline comment which says, \_comments can make code readable, easy to use\_\_and informative\_

**// Comments can make code readable**

**/\* Comments can make code readable,**

**easy to use, and informative**

**\*/**

Type Conversion

----------------------------------------------------------

Declare a variable price with the value "100".

Convert price to a number and log the result.

Convert price back to a string and log the result.

**// Declare price as a string**

**let price = "100";**

**// Convert price to a number**

**let priceAsNumber = Number(price);**

**console.log("Converted to number:", priceAsNumber, "| Type:", typeof priceAsNumber);**

**// Convert price back to a string**

**let priceAsString = String(priceAsNumber);**

**console.log("Converted back to string:", priceAsString, "| Type:", typeof priceAsString);**

Template Literals

------------------------------------------------------------

Create variables for your first name, last name, and favorite programming language.

Use template literals to display: Hi, I'm [first name] [last name], and my favorite language is [language].

Hint : \n \t

**// Declare variables**

**let firstName = "John";**

**let lastName = "Doe";**

**let favoriteLanguage = "JavaScript";**

**// Use template literals to display the message**

**let message = `Hi, I'm ${firstName} ${lastName},\n\tand my favorite language is ${favoriteLanguage}.`;**

**// Log the message**

**console.log(message);**

Booleans

---------------------------------------------------------------------

Boolean value is either true or false.

Write three JavaScript statement which provide truthy value.

Write three JavaScript statement which provide falsy value.

Use all the following comparison operators to compare the following values: >, < >=, <=, !=, !==,===.

Which are true or which are false ?

1. 4 > 3

1. 4 >= 3

1. 4 < 3

1. 4 <= 3

1. 4 == 4

1. 4 === 4

1. 4 != 4

1. 4 !== 4

1. 4 != '4'

1. 4 == '4'

1. 4 === '4'

**//truthly values**

**console.log(Boolean(1)); // true (non-zero number)**

**console.log(Boolean("Hello")); // true (non-empty string)**

**console.log(Boolean([])); // true (empty array)**

**//falsely values**

**console.log(Boolean(0)); // false (zero)**

**console.log(Boolean("")); // false (empty string)**

**console.log(Boolean(null)); // false (null)**

**//comparison operators**

**console.log("1. 4 > 3 :", 4 > 3); // true**

**console.log("2. 4 >= 3 :", 4 >= 3); // true**

**console.log("3. 4 < 3 :", 4 < 3); // false**

**console.log("4. 4 <= 3 :", 4 <= 3); // false**

**console.log("5. 4 == 4 :", 4 == 4); // true**

**console.log("6. 4 === 4:", 4 === 4); // true**

**console.log("7. 4 != 4 :", 4 != 4); // false**

**console.log("8. 4 !== 4:", 4 !== 4); // false**

**console.log("9. 4 != '4':", 4 != '4'); // false (== performs type coercion)**

**console.log("10. 4 == '4':", 4 == '4'); // true (== allows type conversion)**

**console.log("11. 4 === '4':", 4 === '4'); // false (=== checks type as well)**

Logical Operators

------------------------------------------------------------------------------

Which are true or which are false ?

4 > 3 && 10 < 12

4 > 3 && 10 > 12

4 > 3 || 10 < 12

4 > 3 || 10 > 12

!(4 > 3)

!(4 < 3)

!(false)

!(4 > 3 && 10 < 12)

!(4 > 3 && 10 > 12)

!(4 === '4')

**console.log("1. 4 > 3 && 10 < 12 :", 4 > 3 && 10 < 12); // true**

**console.log("2. 4 > 3 && 10 > 12 :", 4 > 3 && 10 > 12); // false**

**console.log("3. 4 > 3 || 10 < 12 :", 4 > 3 || 10 < 12); // true**

**console.log("4. 4 > 3 || 10 > 12 :", 4 > 3 || 10 > 12); // true**

**console.log("5. !(4 > 3) :", !(4 > 3)); // false**

**console.log("6. !(4 < 3) :", !(4 < 3)); // true**

**console.log("7. !(false) :", !(false)); // true**

**console.log("8. !(4 > 3 && 10 < 12):", !(4 > 3 && 10 < 12)); // false**

**console.log("9. !(4 > 3 && 10 > 12):", !(4 > 3 && 10 > 12)); // true**

**console.log("10. !(4 === '4') :", !(4 === '4')); // true**

String

----------------------------------------------------------------------------------

Declare a variable name company and assign it to an initial value \*\*'Coding Academy'\*\*.

Print the string on the browser console using \_\_console.log()\_\_

Print the \_\_length\_\_ of the string on the browser console using \_console.log()\_

Change all the string to capital letters using \_\_toUpperCase()\_\_ method

Change all the string to lowercase letters using \_\_toLowerCase()\_\_ method

Cut(slice) out the first word of the string using \_\_slice\_\_, \_\_substr()\_\_ or \_\_substring()\_\_ method

Use \_\_substr\_\_ to slice out the phase \_\_because because because\_\_ in the following sentence:\_\_'You cannot end a sentence with because because because is a conjunction'\_\_

Check if the string contains a word \_\_Academy\_\_ using \_\_includes()\_\_ method

Split the \_\_string\_\_ into \_\_array\_\_ using \_\_split()\_\_ method

Split the string Coding Academy at the space using \_\_split()\_\_ method

'Facebook, Google, Microsoft, Apple, IBM, Oracle, Amazon' \_\_split\_\_ the string at the comma and change it to an array.

Change Coding Academy to Microsoft Academy using \_\_replace()\_\_ method.

What is character at index 10 in 'Coding Academy' string use \_\_charAt()\_\_ method.

What is the character code of A in 'Coding Academy' string using \_\_charCodeAt()\_\_

Use \_\_indexOf\_\_ to determine the position of the first occurrence of c in Coding Academy

Use \_\_lastIndexOf\_\_ to determine the position of the last occurrence of c in Coding Academy.

Use \_\_indexOf\_\_ to find the position of the first occurrence of the word \_\_because\_\_ in the following sentence:\_\_'You cannot end a sentence with because because because is a conjunction'\_\_

Use \_\_lastIndexOf\_\_ to find the position of the first occurrence of the word \_\_because\_\_ in the following sentence:\_\_'You cannot end a sentence with because because because is a conjunction'\_\_

Use \_\_search\_\_ to find the position of the first occurrence of the word \_\_because\_\_ in the following sentence:\_\_'You cannot end a sentence with because because because is a conjunction'\_\_

\_\_trim()\_\_ to remove if there is trailing whitespace at the beginning and the end of a string.E.g ' Coding Academy '.

\_\_startsWith()\_\_ method with the string Coding Academy make the result true

Use \_\_endsWith()\_\_ method with the string Coding Academy make the result true

Use \_\_match()\_\_ method to find all the c’s in Coding Academy

Use \_\_match()\_\_ to count the number all because's in the following sentence:\_\_'You cannot end a sentence with because because because is a conjunction'\_\_

Use \_\_concat()\_\_ and merge 'Coding' and 'Academy' to a single string, 'Coding Academy'

Use \_\_repeat()\_\_ method to print Coding Academy 5 times

Calculate the total annual income of the person by extract the numbers from the following text. 'He earns 5000 euro from salary per month, 10000 euro annual bonus, 15000 euro online courses per month.' Hint Regex

**// 1. Declare a variable and print the string on the console**

**let company = 'Coding Academy';**

**console.log(company);**

**// 2. Print the length of the string**

**console.log(company.length);**

**// 3. Convert string to uppercase**

**console.log(company.toUpperCase());**

**// 4. Convert string to lowercase**

**console.log(company.toLowerCase());**

**// 5. Cut (slice) out the first word using slice, substr or substring**

**console.log(company.slice(0, company.indexOf(' '))); // using slice**

**console.log(company.substr(0, company.indexOf(' '))); // using substr**

**console.log(company.substring(0, company.indexOf(' '))); // using substring**

**// 6. Use substr to slice out 'because because because' from a sentence**

**let sentence = 'You cannot end a sentence with because because because is a conjunction';**

**console.log(sentence.substr(30, 23)); // starts at index 30 and extracts 'because because because'**

**// 7. Check if the string contains the word 'Academy'**

**console.log(company.includes('Academy')); // true**

**// 8. Split the string into an array**

**console.log(company.split(' ')); // ['Coding', 'Academy']**

**// 9. Split the string at the space**

**console.log(company.split(' ')); // ['Coding', 'Academy']**

**// 10. Split the string 'Facebook, Google, Microsoft, Apple, IBM, Oracle, Amazon' at commas**

**let companies = 'Facebook, Google, Microsoft, Apple, IBM, Oracle, Amazon';**

**console.log(companies.split(', ')); // ['Facebook', 'Google', 'Microsoft', 'Apple', 'IBM', 'Oracle', 'Amazon']**

**// 11. Change 'Coding Academy' to 'Microsoft Academy' using replace**

**company = company.replace('Coding', 'Microsoft');**

**console.log(company); // 'Microsoft Academy'**

**// 12. What is the character at index 10 in 'Coding Academy'**

**console.log(company.charAt(10)); // 'A'**

**// 13. What is the character code of 'A' in 'Coding Academy'**

**console.log(company.charCodeAt(10)); // 65 (Unicode value of 'A')**

**// 14. Use indexOf to determine the position of the first occurrence of 'c'**

**console.log(company.indexOf('c')); // 0 (position of 'C' in 'Coding')**

**// 15. Use lastIndexOf to determine the position of the last occurrence of 'c'**

**console.log(company.lastIndexOf('c')); // 0 (last occurrence of 'C')**

**// 16. Use indexOf to find the first occurrence of 'because' in the sentence**

**console.log(sentence.indexOf('because')); // 30 (position of first 'because')**

**// 17. Use lastIndexOf to find the position of the last 'because'**

**console.log(sentence.lastIndexOf('because')); // 46 (position of last 'because')**

**// 18. Use search to find the position of the first occurrence of 'because'**

**console.log(sentence.search('because')); // 30 (first occurrence)**

**// 19. Use trim to remove trailing whitespace**

**let paddedString = ' Coding Academy ';**

**console.log(paddedString.trim()); // 'Coding Academy'**

**// 20. Use startsWith to check if the string starts with 'Coding'**

**console.log(company.startsWith('Coding')); // true**

**// 21. Use endsWith to check if the string ends with 'Academy'**

**console.log(company.endsWith('Academy')); // true**

**// 22. Use match to find all 'c's in 'Coding Academy'**

**console.log(company.match(/c/gi)); // ['C', 'c'] (all 'c' characters)**

**// 23. Use match to count all occurrences of 'because' in the sentence**

**console.log(sentence.match(/because/gi)); // ['because', 'because', 'because']**

**// 24. Use concat to merge 'Coding' and 'Academy' to a single string**

**let coding = 'Coding';**

**let academy = 'Academy';**

**console.log(coding.concat(' ', academy)); // 'Coding Academy'**

**// 25. Use repeat to print 'Coding Academy' 5 times**

**console.log(company.repeat(5)); // 'Coding AcademyCoding AcademyCoding AcademyCoding AcademyCoding Academy'**

**// 26. Calculate the total annual income by extracting numbers from the string using regex**

**let incomeText = 'He earns 5000 euro from salary per month, 10000 euro annual bonus, 15000 euro online courses per month.';**

**let monthlySalary = parseInt(incomeText.match(/\d+/)[0]);**

**let annualBonus = parseInt(incomeText.match(/\d+/g)[1]);**

**let onlineCourses = parseInt(incomeText.match(/\d+/g)[2]);**

**// Calculate the total annual income**

**let annualIncome = (monthlySalary \* 12) + annualBonus + (onlineCourses \* 12);**

**console.log('Total annual income:', annualIncome); // 156000**

Variable Scope

------------------------------------------------------------------

Declare a variable with var, let, and const inside a block {}.

Log their values inside and outside the block.

**{**

**var varVariable = "I am var inside block";**

**let letVariable = "I am let inside block";**

**const constVariable = "I am const inside block";**

**console.log(varVariable); // Accessible inside the block**

**console.log(letVariable); // Accessible inside the block**

**console.log(constVariable); // Accessible inside the block**

**}**

**console.log(varVariable); // Accessible outside the block (due to var being function-scoped or globally scoped)**

**console.log(letVariable); // Error: let is block-scoped**

**console.log(constVariable); // Error: const is block-scoped**

Find the Bug

Look at the following code snippet. Identify and fix any issues related to variable scope or declaration.

javascript

if (true) {

var data = "Important data";

let info = "Confidential info";

}

console.log(data); // Should this be accessible?

console.log(info); // Should this be accessible?

**if (true) {**

**let data = "Important data"; // Changed from var to let**

**let info = "Confidential info";**

**}**

**console.log(data); // Error: `data` is block-scoped with let**

**console.log(info); // Error: `info` is block-scoped**

Simulating a Security Flaw

Write a function where var allows access to a sensitive variable that should remain secure inside a block. Fix the issue by replacing var with let or const.

Example:

javascript

function simulateFlaw() {

if (true) {

var sensitiveData = "This should not leak!";

}

console.log(sensitiveData); // Leaked!

}

simulateFlaw();

**function simulateFlawFixed() {**

**if (true) {**

**let sensitiveData = "This should not leak!"; // Use let or const here**

**}**

**// console.log(sensitiveData); // Error: sensitiveData is not accessible outside the block**

**}**

**simulateFlawFixed();**

Control Structures

--------------------------------------------------------------

Asks the user to input a number.

Checks if the number is positive, negative, or zero.

Displays an appropriate message.

**let number = prompt("Enter a number:"); // Takes input from the user**

**if (number > 0) {**

**console.log("The number is positive.");**

**} else if (number < 0) {**

**console.log("The number is negative.");**

**} else {**

**console.log("The number is zero.");**

**}**

Switch Statement

Create a program that:

Takes a day of the week as input (e.g., "Monday").

Displays whether it's a weekday or weekend using a switch statement.

**let day = prompt("Enter the day of the week:"); // Takes input from the user**

**switch (day.toLowerCase()) {**

**case "monday":**

**case "tuesday":**

**case "wednesday":**

**case "thursday":**

**case "friday":**

**console.log("It's a weekday.");**

**break;**

**case "saturday":**

**case "sunday":**

**console.log("It's a weekend.");**

**break;**

**default:**

**console.log("Invalid input, please enter a valid day.");**

**}**

Get user input using prompt(“Enter your age:”). If user is 18 or older , give feedback:You are old enough to drive but if not 18 give feedback to wait for the years he supposed to wait for.

Output:

```sh

Enter your age: 30

You are old enough to drive.

```

**let age = prompt("Enter your age:"); // Takes input from the user**

**if (age >= 18) {**

**console.log("You are old enough to drive.");**

**} else {**

**console.log(`You are left with ${18 - age} years to drive.`);**

**}**

Compare the values of myAge and yourAge using if … else. Based on the comparison log to console who is older (me or you). Use prompt(“Enter your age:”) to get the age as input.

Output:

```sh

Enter your age: 30

You are 5 years older than me.

```

**let myAge = 30; // You can change this value as per requirement**

**let yourAge = prompt("Enter your age:");**

**if (yourAge > myAge) {**

**console.log("You are older than me.");**

**} else if (yourAge < myAge) {**

**console.log("I am older than you.");**

**} else {**

**console.log("We are the same age.");**

**}**

If a is greater than b return a is greater than b else a is less than b.

Output:

```sh

let a = 4

let b = 3

4 is greater than 3

```

**let a = 4;**

**let b = 3;**

**if (a > b) {**

**console.log(`${a} is greater than ${b}`);**

**} else {**

**console.log(`${a} is less than ${b}`);**

**}**

Write a code which give grade students according to theirs scores:

- 80-100, A

- 70-89, B

- 60-69, C

- 50-59, D

- 0 -49, F

**let score = prompt("Enter the student's score:");**

**if (score >= 80 && score <= 100) {**

**console.log("Grade: A");**

**} else if (score >= 70 && score <= 89) {**

**console.log("Grade: B");**

**} else if (score >= 60 && score <= 69) {**

**console.log("Grade: C");**

**} else if (score >= 50 && score <= 59) {**

**console.log("Grade: D");**

**} else if (score >= 0 && score <= 49) {**

**console.log("Grade: F");**

**} else {**

**console.log("Invalid score.");**

**}**

Check if the season is Autumn, Winter, Spring or Summer.

If the user input is:

- September, October or November, the season is Autumn.

- December, January or February, the season is Winter.

- March, April or May, the season is Spring

- June, July or August, the season is Summer

**let month = prompt("Enter the month (e.g., January, March, etc.):");**

**switch (month.toLowerCase()) {**

**case "september":**

**case "october":**

**case "november":**

**console.log("The season is Autumn.");**

**break;**

**case "december":**

**case "january":**

**case "february":**

**console.log("The season is Winter.");**

**break;**

**case "march":**

**case "april":**

**case "may":**

**console.log("The season is Spring.");**

**break;**

**case "june":**

**case "july":**

**case "august":**

**console.log("The season is Summer.");**

**break;**

**default:**

**console.log("Invalid month.");**

**}**

For Loops

Write a script to:

Print all even numbers between 1 and 20.

Bonus: Modify it to calculate and display the sum of these numbers.

Functions

-------------------------------------------------------------------------

Function Declaration

Write a function greet(name) that:

Accepts a name as an argument.

Returns a greeting message: Hello, [name]!.

Test the function with at least three different names.

Function with Multiple Parameters

Write a function calculateArea(length, width) that:

Calculates the area of a rectangle.

Returns the area.

Test the function with various lengths and widths.

**function calculateArea(length, width) {**

**return length \* width;**

**}**

**// Test the function**

**console.log(calculateArea(5, 10)); // Output: 50**

**console.log(calculateArea(3, 7)); // Output: 21**

**console.log(calculateArea(8, 2)); // Output: 16**

Arrow Functions

Write an arrow function square(num) that:

Returns the square of a number.

Test it by passing different numbers and logging the results.

**const square = (num) => num \* num;**

**// Test the function**

**console.log(square(2)); // Output: 4**

**console.log(square(5)); // Output: 25**

**console.log(square(10)); // Output: 100**

Recursive Function

Write a function factorial(n) that:

Calculates the factorial of a number recursively.

Returns the result.

Test the function with numbers like 0, 1, 5, and 7.

**function factorial(n) {**

**if (n === 0 || n === 1) {**

**return 1;**

**}**

**return n \* factorial(n - 1);**

**}**

**// Test the function**

**console.log(factorial(0)); // Output: 1**

**console.log(factorial(1)); // Output: 1**

**console.log(factorial(5)); // Output: 120**

**console.log(factorial(7)); // Output: 5040**

DOM Elements

--------------------------------------------------------------------------------

Changing Text Content

Create an HTML page with:

A heading (h1) with the text "Welcome to JavaScript!"

A button labeled "Change Text."

Write a script that:

Changes the text of the heading to "JavaScript is Fun!" when the button is clicked.

**<!DOCTYPE html>**

**<html lang="en">**

**<head>**

**<meta charset="UTF-8">**

**<meta name="viewport" content="width=device-width, initial-scale=1.0">**

**<title>Change Text Example</title>**

**</head>**

**<body>**

**<h1>Welcome to JavaScript!</h1>**

**<button id="changeTextBtn">Change Text</button>**

**<script>**

**document.getElementById('changeTextBtn').addEventListener('click', function() {**

**document.querySelector('h1').textContent = "JavaScript is Fun!";**

**});**

**</script>**

**</body>**

**</html>**

Changing Styles

Create a webpage with:

A paragraph with some text.

A button labeled "Highlight Text."

Write a script to:

Change the paragraph text color to red and make it bold when the button is clicked.

**<!DOCTYPE html>**

**<html lang="en">**

**<head>**

**<meta charset="UTF-8">**

**<meta name="viewport" content="width=device-width, initial-scale=1.0">**

**<title>Highlight Text Example</title>**

**</head>**

**<body>**

**<p id="text">This is a paragraph of text.</p>**

**<button id="highlightBtn">Highlight Text</button>**

**<script>**

**document.getElementById('highlightBtn').addEventListener('click', function() {**

**let paragraph = document.getElementById('text');**

**paragraph.style.color = 'red';**

**paragraph.style.fontWeight = 'bold';**

**});**

**</script>**

**</body>**

**</html>**

Dynamic List Creation

Create a webpage with:

An input field.

A button labeled "Add Item."

An empty list (ul or ol).

Write a script that:

Adds a new item to the list with the input's value when the button is clicked.

**<!DOCTYPE html>**

**<html lang="en">**

**<head>**

**<meta charset="UTF-8">**

**<meta name="viewport" content="width=device-width, initial-scale=1.0">**

**<title>Dynamic List</title>**

**</head>**

**<body>**

**<input type="text" id="inputItem" placeholder="Enter item">**

**<button id="addItemBtn">Add Item</button>**

**<ul id="itemList"></ul>**

**<script>**

**document.getElementById('addItemBtn').addEventListener('click', function() {**

**let itemText = document.getElementById('inputItem').value;**

**if (itemText) {**

**let listItem = document.createElement('li');**

**listItem.textContent = itemText;**

**document.getElementById('itemList').appendChild(listItem);**

**document.getElementById('inputItem').value = ''; // Clear the input field**

**}**

**});**

**</script>**

**</body>**

**</html>**

Event Listener

Create a webpage with:

A square div (200x200 pixels, background color: blue).

Write a script that:

Changes the square's background color to yellow when hovered over.

Reverts to blue when the mouse leaves.

**<!DOCTYPE html>**

**<html lang="en">**

**<head>**

**<meta charset="UTF-8">**

**<meta name="viewport" content="width=device-width, initial-scale=1.0">**

**<title>Hover Square</title>**

**<style>**

**#square {**

**width: 200px;**

**height: 200px;**

**background-color: blue;**

**}**

**</style>**

**</head>**

**<body>**

**<div id="square"></div>**

**<script>**

**const square = document.getElementById('square');**

**square.addEventListener('mouseover', function() {**

**square.style.backgroundColor = 'yellow';**

**});**

**square.addEventListener('mouseout', function() {**

**square.style.backgroundColor = 'blue';**

**});**

**</script>**

**</body>**

**</html>**

Arrays

--------------------------------------------------------------------------------------------------------

Declare an \_empty\_ array;

Declare an array with more than 5 number of items

Find the length of your array

Get the first item, the middle item and the last item of the array

Declare an array called \_mixedDataTypes\_,put different data types and in your array and the array size should be greater than 5

Declare an array variable name itCompanies and assign initial values Facebook, Google, Microsoft, Apple, IBM, Oracle and Amazon.

Print the array using \_console.log()\_

Print the number of companies in the array

Print the first company, middle and last company

Print out each company

Change companies to uppercase and print them out

Print the array like as a sentence: Facebook, Google, Microsoft, Apple, IBM,Oracle and Amazon are big IT companies.

Check if a certain company exists in the itCompanies array. If it exist return the company else return a company is \_not found\_.

Filter out companies which have more than one 'o' without the filter method

Sort the array using \_sort()\_ method

Reverse the array without \_reverse\_ method

Reverse the array using \_reverse()\_ method

Slice out the first 3 companies from the array

Slice out the last 3 companies from the array

Slice out the middle IT company or companies from the array

Remove the first IT company from the array

Remove the middle IT company or companies from the array

Remove the last IT company from the array

Remove all IT companies

**// 1. Declare an empty array**

**let emptyArray = [];**

**// 2. Declare an array with more than 5 items**

**let numbers = [10, 20, 30, 40, 50, 60, 70];**

**// 3. Find the length of the array**

**console.log("Array Length:", numbers.length);**

**// 4. Get the first, middle, and last item of the array**

**console.log("First Item:", numbers[0]);**

**console.log("Middle Item:", numbers[Math.floor(numbers.length / 2)]);**

**console.log("Last Item:", numbers[numbers.length - 1]);**

**// 5. Declare an array with different data types**

**let mixedDataTypes = [25, "JavaScript", true, { name: "Alice" }, [1, 2, 3], null];**

**console.log("Mixed Data Types Length:", mixedDataTypes.length);**

**// 6. Declare an IT companies array**

**let itCompanies = ["Facebook", "Google", "Microsoft", "Apple", "IBM", "Oracle", "Amazon"];**

**// 7. Print the array**

**console.log("IT Companies:", itCompanies);**

**// 8. Print the number of companies**

**console.log("Number of Companies:", itCompanies.length);**

**// 9. Print first, middle, and last company**

**console.log("First Company:", itCompanies[0]);**

**console.log("Middle Company:", itCompanies[Math.floor(itCompanies.length / 2)]);**

**console.log("Last Company:", itCompanies[itCompanies.length - 1]);**

**// 10. Print out each company**

**itCompanies.forEach(company => console.log(company));**

**// 11. Convert all companies to uppercase**

**console.log("Uppercase Companies:", itCompanies.map(company => company.toUpperCase()));**

**// 12. Print array as a sentence**

**console.log(itCompanies.join(", ") + " are big IT companies.");**

**// 13. Check if a company exists**

**let searchCompany = "Google";**

**console.log(itCompanies.includes(searchCompany) ? searchCompany : "Company is not found.");**

**// 14. Filter out companies with more than one 'o' (without filter method)**

**let filteredCompanies = [];**

**for (let company of itCompanies) {**

**let count = (company.match(/o/g) || []).length;**

**if (count <= 1) filteredCompanies.push(company);**

**}**

**console.log("Filtered Companies:", filteredCompanies);**

**// 15. Sort the array**

**console.log("Sorted Companies:", [...itCompanies].sort());**

**// 16. Reverse the array without using reverse()**

**let reversedCompanies = [];**

**for (let i = itCompanies.length - 1; i >= 0; i--) {**

**reversedCompanies.push(itCompanies[i]);**

**}**

**console.log("Reversed Companies (Manual):", reversedCompanies);**

**// 17. Reverse using reverse()**

**console.log("Reversed Companies (Using reverse()):", [...itCompanies].reverse());**

**// 18. Slice out the first 3 companies**

**console.log("First 3 Companies:", itCompanies.slice(0, 3));**

**// 19. Slice out the last 3 companies**

**console.log("Last 3 Companies:", itCompanies.slice(itCompanies.length - 3));**

**// 20. Slice out the middle company/companies**

**let middleIndex = Math.floor(itCompanies.length / 2);**

**console.log("Middle Company/Companies:",**

**itCompanies.length % 2 === 0**

**? itCompanies.slice(middleIndex - 1, middleIndex + 1)**

**: itCompanies.slice(middleIndex, middleIndex + 1)**

**);**

**// 21. Remove the first company**

**itCompanies.shift();**

**console.log("After Removing First Company:", itCompanies);**

**// 22. Remove the middle company**

**middleIndex = Math.floor(itCompanies.length / 2);**

**itCompanies.splice(middleIndex, 1);**

**console.log("After Removing Middle Company:", itCompanies);**

**// 23. Remove the last company**

**itCompanies.pop();**

**console.log("After Removing Last Company:", itCompanies);**

**// 24. Remove all companies**

**itCompanies.length = 0;**

**console.log("After Removing All Companies:", itCompanies);**

Date Object

---------------------------------------------------------------------

Use the new Date() object to get \_month, date, year, hour\_ and \_minute\_.

Write a function name \_displayDateTime\_ which display time in this format: 10/03/2019 04:08

```sh

displayDateTime()

10/03/2019 04:08

```

Exercises

-----------------------------------------------------------------

```js

const skills = ['HTML', 'CSS', 'JS', 'React','Node', 'Python']

let age = 250;

let isMarried = true

const student = {

firstName:'Asabeneh',

lastName:'Yetayehe',

age:250,

isMarried:true,

skills:['HTML', 'CSS', 'JS', 'React','Node', 'Python', ]

}

const txt = `{

"Alex": {

"email": "alex@alex.com",

"skills": [

"HTML",

"CSS",

"JavaScript"

],

"age": 20,

"isLoggedIn": false,

"points": 30

},

"Asab": {

"email": "asab@asab.com",

"skills": [

"HTML",

"CSS",

"JavaScript",

"Redux",

"MongoDB",

"Express",

"React",

"Node"

],

"age": 25,

"isLoggedIn": false,

"points": 50

},

"Brook": {

"email": "daniel@daniel.com",

"skills": [

"HTML",

"CSS",

"JavaScript",

"React",

"Redux"

],

"age": 30,

"isLoggedIn": true,

"points": 50

},

"Daniel": {

"email": "daniel@alex.com",

"skills": [

"HTML",

"CSS",

"JavaScript",

"Python"

],

"age": 20,

"isLoggedIn": false,

"points": 40

},

"John": {

"email": "john@john.com",

"skills": [

"HTML",

"CSS",

"JavaScript",

"React",

"Redux",

"Node.js"

],

"age": 20,

"isLoggedIn": true,

"points": 50

},

"Thomas": {

"email": "thomas@thomas.com",

"skills": [

"HTML",

"CSS",

"JavaScript",

"React"

],

"age": 20,

"isLoggedIn": false,

"points": 40

},

"Paul": {

"email": "paul@paul.com",

"skills": [

"HTML",

"CSS",

"JavaScript",

"MongoDB",

"Express",

"React",

"Node"

],

"age": 20,

"isLoggedIn": false,

"points": 40

}

}

`

```

Change skills array to JSON using JSON.stringify()

Stringify the age variable

Stringify the isMarried variable

Stringify the student object

Stringify the students object with only firstName, lastName and skills properties

Exercises

```js

const countries = ['Estonia', 'Finland', 'Sweden', 'Denmark', 'Norway', 'IceLand'];

const names = ['Asabeneh', 'Mathias', 'Elias', 'Brook'];

const numbers = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]

```

1. Explain the difference between \*\*\*forEach, map, filter, and reduce\*\*\*.

2. Define a call function before you them in forEach, map, filter or reduce.

3. Use \*\*\*forEach\*\*\* to console.log each country in the countries array.

4. Use \*\*\*forEach\*\*\* to console.log each name in the names array.

5. Use \*\*\*forEach\*\*\* to console.log each number in the numbers array.

6. Use \*\*\*map\*\*\* to create a new array by changing each country to uppercase in the countries array;

7. Use \*\*\*map\*\*\* to create a new array by changing each number to square in the numbers array

8. Use \*\*\*map\*\*\* to change to each name to uppercase in the names array

9. Use \*\*\*filter\*\*\* to filter out countries containing \*\*\*land\*\*\*.

10. Use \*\*\*filter\*\*\* to filter out countries having six character.

11. Use \*\*\*filter\*\*\* to filter out countries containing six letters and more in the country array.

12. Use \*\*\*filter\*\*\* to filter out country start with 'E';

13. Chain two or more array iterators(eg. arr.map(callback).filter(callback).reduce(callback))

14. Declare a function called getStringLists which takes an array as a parameter and then returns an array only with string items.

15. Use \*\*\*reduce\*\*\* to sum all the numbers in the numbers array.

16. Use \*\*\*reduce\*\*\* to concatenate all the countries and to produce this sentence: \*\*\*Estonia, Finland, Sweden, Denmark, Norway, and IceLand are north European countries\*\*\*

17. Explain the difference between \*\*\*some\*\*\* and \*\*\*every\*\*\*

18. Use \*\*\*some\*\*\* to check if some names' length greater than seven in names array

19. Use \*\*\*every\*\*\* to check if all the countries contain the word land

20. Explain the difference between \*\*\*find\*\*\* and \*\*\*findIndex\*\*\*.

21. Use \*\*\*find\*\*\* to find the first country containing only six letters in the countries array

22. Use \*\*\*findIndex\*\*\* to find the position of the first country containing only six letters in the countries array

23. Use \*\*\*findIndex\*\*\* to find the position of \*\*\*Norway\*\*\* if it doesn't exist in the array you will get -1.

24. Use \*\*\*findIndex\*\*\* to find the position of \*\*\*Russia\*\*\* if it doesn't exist in the array you will get -1.

25. Declare a function called \*\*\*categorizeCountries\*\*\* which returns an array of countries which have some common pattern(you find the countries array in this repository as countries.js(eg 'land', 'ia', 'island','stan')).

26. Create a function which return an array of objects, which is the letter and the number of times the letter use to start with a name of a country.

27. Declare a \*\*\*getFirstTenCountries\*\*\* function and return an array of ten countries. Use different functional programming to work on the countries.js array

28. Declare a \*\*\*getLastTenCountries\*\*\* function which which returns the last ten countries in the countries array.

29. Find out which \*letter\* is used many \*times\* as initial for a country name from the countries array (eg. Finland, Fiji, France etc)

30. Use the countries information, in the data folder. Sort countries by name, by capital, by population

31. Sort out the ten most spoken languages by location.

32. Sort out the ten most populated countries.

Exercise: Destructuring

```js

const constants = [2.72, 3.14, 9.81,37, 100]

const countries = ['Finland', 'Estonia', 'Sweden', 'Denmark', 'Norway']

const rectangle = {

width:20,

height:10,

area:200,

perimeter:60

}

```

1. Assign the elements of constants array to e, pi, gravity, humanBodyTemp, waterBoilingTemp.

2. Assign the elements of countries array to fin, est, sw, den, nor

3. Destructure the rectangle object by its properties or keys.

### Exercises: Set and Map

### Exercises:Level 1

```js

const a = {4, 5, 8, 9}

const b = {3, 4, 5, 7}

const countries = ['Finland', 'Sweden', 'Norway']

```

1. create an empty set

2. Create a set containing 0 to 10 using loop

3. Remove an element from a set

4. Clear a set

5. Create a set of 5 string elements from array

6. Create a map of countries and number of characters of a country

### Exercises:Level 2

1. Find a union b

2. Find a intersection b

3. Find a with b

### Exercises:Level 3

1. How many languages are there in the countries object file.

1. \\*\\*\\* Use the countries data to find the 10 most spoken languages:

````js

// Your output should look like this

console.log(mostSpokenLanguages(countries, 10))

[

{'English':91},

{'French':45},

{'Arabic':25},

{'Spanish':24},

{'Russian':9},

{'Portuguese':9},

{'Dutch':8},

{'German':7},

{'Chinese':5},

{'Swahili':4},

{'Serbian':4}]

// Your output should look like this

console.log(mostSpokenLanguages(countries, 3))

[

{'English':91},

{'French':45},

{'Arabic':25}

]````

1. Create an index.html file and put four p elements as above: Get the first paragraph by using \*\*\*document.querySelector(tagname)\*\*\* and tag name

**<!DOCTYPE html>**

**<html lang="en">**

**<head>**

**<meta charset="UTF-8">**

**<meta name="viewport" content="width=device-width, initial-scale=1.0">**

**<title>JavaScript DOM Manipulation</title>**

**<style>**

**.container {**

**display: flex;**

**flex-wrap: wrap;**

**gap: 10px;**

**}**

**.box {**

**width: 150px;**

**height: 150px;**

**display: flex;**

**align-items: center;**

**justify-content: center;**

**font-size: 24px;**

**font-weight: bold;**

**border: 2px solid black;**

**}**

**</style>**

**</head>**

**<body>**

**<p id="p1">First Paragraph</p>**

**<p id="p2">Second Paragraph</p>**

**<p id="p3">Third Paragraph</p>**

**<p id="p4">Fourth Paragraph</p>**

**<div id="container" class="container"></div>**

**<script src="script.js"></script>**

**</body>**

**</html>**

1. Get get each of the the paragraph using \*\*\*document.querySelector('#id')\*\*\* and by their id

3. Get all the p as nodeList using \*\*\*document.querySelectorAll(tagname)\*\*\* and by their tag name

4. Loop through the nodeList and get the text content of each paragraph

5. Set a text content to paragraph the fourth paragraph,\*\*\*Fourth Paragraph\*\*\*

6. Set id and class attribute for all the paragraphs using different attribute setting methods

7. Change stye of each paragraph using JavaScript(eg. color, background, border, font-size, font-family)

8. Select all paragraphs and loop through each elements and give the first and third paragraph a color of color, and the second and the fourth paragraph a red color

9. Remove all the paragraph and create them using JavaScript

10. Set text content, id and class to each paragraph

11. Create a div container on HTML document and create 100 numbers dynamically and append to the container div. Put each number in 150px by 150px box. If the number is even the background will be lightgreen else lightblue.

12. Use the rgb color generator function or hexaColor generator to create 10 divs with random background colors

13. Use the countries.js to visualize all the countries on the HTML document. You need one wrapper div and box for each countries. In the box display, the letter the country starts with, the name of the country and the number of characters for the country name.

**// 1. Get first paragraph using document.querySelector(tagname)**

**let firstParagraph = document.querySelector("p");**

**console.log(firstParagraph.textContent);**

**// 2. Get each paragraph using document.querySelector('#id')**

**let p1 = document.querySelector("#p1");**

**let p2 = document.querySelector("#p2");**

**let p3 = document.querySelector("#p3");**

**let p4 = document.querySelector("#p4");**

**console.log(p1.textContent, p2.textContent, p3.textContent, p4.textContent);**

**// 3. Get all paragraphs as a NodeList**

**let paragraphs = document.querySelectorAll("p");**

**console.log(paragraphs);**

**// 4. Loop through NodeList and get text content**

**paragraphs.forEach(p => console.log(p.textContent));**

**// 5. Set text content to fourth paragraph**

**p4.textContent = "Fourth Paragraph";**

**// 6. Set id and class attributes to all paragraphs**

**paragraphs.forEach((p, index) => {**

**p.setAttribute("id", `para-${index + 1}`);**

**p.classList.add("paragraph-class");**

**});**

**// 7. Change styles of each paragraph**

**paragraphs.forEach(p => {**

**p.style.color = "white";**

**p.style.backgroundColor = "black";**

**p.style.border = "1px solid red";**

**p.style.fontSize = "18px";**

**p.style.fontFamily = "Arial, sans-serif";**

**p.style.padding = "10px";**

**});**

**// 8. Set different colors for paragraphs**

**paragraphs.forEach((p, index) => {**

**p.style.color = index % 2 === 0 ? "blue" : "red";**

**});**

**// 9. Remove all paragraphs and recreate them dynamically**

**document.body.innerHTML = ""; // Clear everything**

**let newContainer = document.createElement("div");**

**newContainer.id = "container";**

**document.body.appendChild(newContainer);**

**let newParagraphs = ["First Paragraph", "Second Paragraph", "Third Paragraph", "Fourth Paragraph"];**

**newParagraphs.forEach((text, index) => {**

**let newP = document.createElement("p");**

**newP.textContent = text;**

**newP.id = `new-p${index + 1}`;**

**newP.classList.add("new-paragraph-class");**

**document.body.appendChild(newP);**

**});**

**// 10. Create 100 numbers dynamically**

**let container = document.getElementById("container");**

**for (let i = 1; i <= 100; i++) {**

**let box = document.createElement("div");**

**box.textContent = i;**

**box.classList.add("box");**

**box.style.backgroundColor = i % 2 === 0 ? "lightgreen" : "lightblue";**

**container.appendChild(box);**

**}**

**// 11. Generate 10 divs with random background colors**

**function randomHexColor() {**

**return `#${Math.floor(Math.random() \* 16777215).toString(16)}`;**

**}**

**for (let i = 0; i < 10; i++) {**

**let randomBox = document.createElement("div");**

**randomBox.classList.add("box");**

**randomBox.style.backgroundColor = randomHexColor();**

**randomBox.textContent = i + 1;**

**container.appendChild(randomBox);**

**}**

**// 12. Visualizing countries**

**let countries = ["USA", "Canada", "Brazil", "Germany", "France", "India", "China", "Japan", "South Africa", "Australia"];**

**let countriesWrapper = document.createElement("div");**

**countriesWrapper.style.display = "flex";**

**countriesWrapper.style.flexWrap = "wrap";**

**document.body.appendChild(countriesWrapper);**

**countries.forEach(country => {**

**let countryBox = document.createElement("div");**

**countryBox.classList.add("box");**

**countryBox.style.backgroundColor = randomHexColor();**

**countryBox.innerHTML = `<strong>${country[0]}</strong><br>${country}<br>(${country.length} letters)`;**

**countriesWrapper.appendChild(countryBox);**

**});**

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“Success isn’t overnight. It’s when everyday you get a little better than the day before. It all adds up.” – Dwayne Johnson

“Do what you can, with what you’ve got, where you are.” – Teddy Roosevelt

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