Basic JavaScript Concepts - Lab Assignment Questions

1. Swap Two Variables Without Using a Third Variable

Write a JavaScript program that swaps the values of two variables without using a third temporary variable.

Hint: Use arithmetic operations like addition/subtraction or XOR bitwise operator.

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2. Find the Largest Among Three Numbers

Write a JavaScript function that takes three numbers as input and returns the largest.

Bonus Challenge:

- Find the largest number among **N** user-inputted numbers.

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3. Check If a Number is Even or Odd

Write a JavaScript function that checks if a given number is even or odd.

Bonus Challenge:

- Accept an **array** of numbers and return an array with even and odd numbers separated.

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4. Reverse a Number

Write a JavaScript function to reverse the digits of a given number.

Example:
Input: `12345`
Output: `54321`

Bonus Challenge:

- Check if the reversed number is the same as the original (palindromic number).

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5. Count Digits in a Number

Write a JavaScript program that counts and prints the number of digits in a given integer.

Example:
Input: `9876`
Output: `4`

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6. Convert Celsius to Fahrenheit

Write a JavaScript function that converts a temperature from Celsius to Fahrenheit.

Formula:

F=(C×95)+32F = (C \times \frac{9}{5}) + 32F=(C×59)+32

Bonus Challenge:

- Add support for Fahrenheit to Celsius conversion.

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7. Generate Fibonacci Series

Write a JavaScript program to generate the **first N** numbers in the Fibonacci sequence.

Example:
Input: `N = 7`
Output: `0, 1, 1, 2, 3, 5, 8`

Bonus Challenge:

- Implement using **recursion**.

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8. Find the GCD (Greatest Common Divisor)

Write a JavaScript function to find the **greatest common divisor (GCD)** of two numbers.

Example:
Input: `(12, 18)`
Output: `6`

Bonus Challenge:

- Implement using **recursion** (Euclidean algorithm).

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9. Find LCM (Least Common Multiple)

Write a JavaScript function that finds the **least common multiple (LCM)** of two numbers.

Formula:

LCM(a,b)=|a×b|GCD(a,b)LCM(a, b) = \frac{|a \times b|}{GCD(a, b)}LCM(a,b)=GCD(a,b)|a×b|

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10. Check if a Number is an Armstrong Number

Write a JavaScript program that checks if a number is an **Armstrong number**.
(An Armstrong number is a number where the sum of its own digits each raised to the power of the number of digits is equal to the original number.)

Example:

- `153 → 1³ + 5³ + 3³ = 153` ✅
- `9474 → 9⁴ + 4⁴ + 7⁴ + 4⁴ = 9474` ✅
- `123 → 1³ + 2³ + 3³ ≠ 123` ❌

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11. Count the Number of Vowels and Consonants in a String

Write a JavaScript function that counts the number of vowels and consonants in a given string.

Example:
Input: `"JavaScript"`
Output:
Vowels: `3` (`a, a, i`)
Consonants: `7`

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12. Remove Duplicates from an Array

Write a JavaScript program to remove duplicate values from an array.

Example:
Input: `[1, 2, 2, 3, 4, 4, 5]`
Output: `[1, 2, 3, 4, 5]`

Bonus Challenge:

- Solve without using `Set()`.

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13. Find the Second Smallest and Second Largest Numbers in an Array

Write a JavaScript program to find the **second smallest** and **second largest** numbers in an array.

Example:
Input: `[4, 2, 9, 1, 5, 6]`
Output:

- Second Smallest: `2`
- Second Largest: `6`

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14. Check If a String is a Pangram

A **pangram** is a sentence that contains every letter of the alphabet at least once.
Write a JavaScript function that checks if a given sentence is a pangram.

Example:
Input: `"The quick brown fox jumps over the lazy dog"`
Output: ✅ It is a pangram.

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15. Find the Missing Number in an Array

Write a JavaScript function to find the **missing number** in a given sequence of numbers (1 to N).

Example:
Input: `[1, 2, 3, 5, 6]`
Output: `4`

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16. Sort an Array Without Using `.sort()`

Write a JavaScript program to sort an array of numbers in ascending order **without using** `.sort()`.

Bonus Challenge:

- Implement **both** ascending and descending sorting.

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17. Convert a Number to Binary

Write a JavaScript function that converts a given decimal number to binary.

Example:
Input: `10`
Output: `1010`

Bonus Challenge:

- Convert **binary to decimal**.

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18. Find the First Non-Repeating Character in a String

Write a JavaScript function to find the first non-repeating character in a given string.

Example:
Input: `"swiss"`
Output: `"w"` (since `"s"` repeats)

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19. Find the Longest Word in a Sentence

Write a JavaScript program that takes a sentence as input and returns the longest word in the sentence.

Example:
Input: `"I love programming in JavaScript"`
Output: `"programming"`

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20. Count the Occurrences of Each Character in a String

Write a JavaScript function that counts how many times each character appears in a given string.

Example:
Input: `"hello"`
Output: `{h: 1, e: 1, l: 2, o: 1}`
