






# Level Up Your JavaScript Skills with These Coding Exercises

Let's dive into some coding exercises that will strengthen your problem-solving abilities and JavaScript skills. Here are five challenges to tackle:

1. Calculate the Factorial: Write a function to calculate the factorial of a given number. 
2. Find the Largest Element: Create a function that finds the largest element in an array of numbers. 
3. Reverse a String: Challenge yourself to reverse a string effectively. 
4. Check for Palindrome: Build a function to check if a string is a palindrome, ignoring spaces and punctuation. 
5. Find the Missing Number: Write a function to find the missing number in an array of consecutive integers. 
6. FizzBuzz: Print numbers from 1 to n, replacing multiples of 3 with "Fizz," multiples of 5 with "Buzz," and multiples of both with "FizzBuzz."
7. Find the Second Largest Element: Discover the second largest element in an array of numbers.
8. Calculate the Fibonacci Sequence: Generate the Fibonacci sequence up to n terms.
9. Capitalize Words in a Sentence: Capitalize the first letter of each word in a sentence.

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10. Remove Duplicates from an Array: Eliminate duplicates from an array using a simple technique.

These exercises cover a range of problem-solving scenarios and are excellent for honing your JavaScript skills. Whether you're a beginner or an experienced coder, these challenges provide valuable practice. So, roll up your sleeves, give them a try, and watch your JavaScript expertise grow! 💻🔥

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## Exercise 1: Calculate the Factorial

Description: Write a JavaScript function to calculate the factorial of a given number.

```
function calculateFactorial(n) {  
  if (n === 0 || n === 1) {  
    return 1;  
  } else {
```

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```
    return n * calculateFactorial(n - 1);
  }
}
```

// Example usage:

```
const result = calculateFactorial(5); // Returns 120
```

Summary: This function calculates the factorial of a number using recursion. It checks if the input is 0 or 1, in which case it returns 1. Otherwise, it recursively calls itself with a decreased value until it reaches 1.

## Exercise 2: Find the Largest Element

Description: Write a JavaScript function to find the largest element in an array of numbers.

```
function findLargestElement(arr) {
  let largest = arr[0];
  for (let i = 1; i < arr.length; i++) {
    if (arr[i] > largest) {
      largest = arr[i];
    }
  }
  return largest;
}
```

```
// Example usage:  
const numbers = [10, 5, 8, 20, 3];  
const largestNumber = findLargestElement(numbers); //  
Returns 20
```

Summary: This function iterates through an array of numbers, comparing each element to the current largest element found so far. It returns the largest element.

### Exercise 3: Reverse a String

Description: Write a JavaScript function to reverse a given string.

```
function reverseString(str) {  
  return str.split('').reverse().join('');  
}
```

```
// Example usage:  
const originalString = 'Hello, World!';  
const reversedString = reverseString(originalString);  
// Returns '!dlroW ,olleH'
```

Summary: This function splits the input string into an array of characters, reverses the order of elements in the array, and then joins them back into a string, effectively reversing the original string.

## Exercise 4: Check for Palindrome

Description: Write a JavaScript function to check if a given string is a palindrome.

```
function isPalindrome(str) {  
  const cleanedStr =  
str.toLowerCase().replace(/[^a-zA-Z0-9]/g, '');  
  const reversedStr =  
cleanedStr.split('').reverse().join('');  
  return cleanedStr === reversedStr;  
}
```

// Example usage:

```
const testString = 'A man, a plan, a canal, Panama';  
const isPalindromeResult = isPalindrome(testString); //  
Returns true
```

Summary: This function removes non-alphanumeric characters, converts the input string to lowercase, and checks if it reads the same forwards and backwards by comparing it to its reverse.

## Exercise 5: Find the Missing Number

Description: Write a JavaScript function to find the missing number in an array of consecutive integers.

```
function findMissingNumber(arr) {  
  const n = arr.length + 1;  
  const expectedSum = (n * (n + 1)) / 2;  
  const actualSum = arr.reduce((acc, num) => acc + num,  
0);  
  return expectedSum - actualSum;  
}
```

// Example usage:

```
const numbers = [1, 2, 3, 5, 6, 7];  
const missingNumber = findMissingNumber(numbers); //
```

Returns 4

Summary: This function calculates the expected sum of consecutive integers up to the length of the array and subtracts the actual sum of the array elements to find the missing number.

## Exercise 6: FizzBuzz

Description: Write a JavaScript function that prints numbers from 1 to n, but for multiples of 3, print "Fizz" instead of the number, and for multiples of 5, print "Buzz." For numbers that are multiples of both 3 and 5, print "FizzBuzz."

```
function fizzBuzz(n) {
  for (let i = 1; i <= n; i++) {
    if (i % 3 === 0 && i % 5 === 0) {
      console.log("FizzBuzz");
    } else if (i % 3 === 0) {
      console.log("Fizz");
    } else if (i % 5 === 0) {
      console.log("Buzz");
    } else {
      console.log(i);
    }
  }
}
```

// Example usage:

```
fizzBuzz(15); // Prints FizzBuzz, 1, 2, Fizz, 4, Buzz,
...
```

Summary: This function uses a for loop to iterate from 1 to n and checks each number for divisibility by 3 and 5 to print "Fizz," "Buzz," or "FizzBuzz" accordingly.

## Exercise 7: Find the Second Largest Element

Description: Write a JavaScript function to find the second largest element in an array of numbers.

```
function findSecondLargestElement(arr) {  
  arr.sort((a, b) => b - a);  
  return arr[1];  
}
```

// Example usage:

```
const numbers = [10, 5, 8, 20, 3];
```

```
const secondLargest =
```

```
findSecondLargestElement(numbers); // Returns 10
```

Summary: This function sorts the array in descending order and returns the second element, which is the second largest element in the array.



## Exercise 8: Calculate the Fibonacci Sequence

Description: Write a JavaScript function to generate the Fibonacci sequence up to n terms.

```
function generateFibonacci(n) {  
  const fibonacci = [0, 1];  
  for (let i = 2; i < n; i++) {  
    fibonacci.push(fibonacci[i - 1] + fibonacci[i -  
2]);  
  }  
  return fibonacci;  
}
```

// Example usage:

```
const fibonacciSequence = generateFibonacci(10); //
```

Returns [0, 1, 1, 2, 3, 5, 8, 13, 21, 34]

Summary: This function uses a for loop to generate the Fibonacci sequence up to n terms and stores the results in an array.

## Exercise 9: Capitalize Words in a Sentence

Description: Write a JavaScript function that capitalizes the first letter of each word in a sentence.

```
function capitalizeWords(sentence) {  
  return sentence  
    .split(" ")  
    .map((word) => word.charAt(0).toUpperCase() +  
word.slice(1))  
    .join(" ");  
}
```

// Example usage:

```
const originalSentence = "hello world";  
const capitalizedSentence =  
capitalizeWords(originalSentence); // Returns "Hello  
World"
```

Summary: This function splits the sentence into words, capitalizes the first letter of each word, and then joins them back into a sentence.

## Exercise 10: Remove Duplicates from an Array

Description: Write a JavaScript function to remove duplicates from an array.

```
function removeDuplicates(arr) {  
  return Array.from(new Set(arr));  
}
```

```
// Example usage:  
const numbers = [1, 2, 2, 3, 4, 4, 5];  
const uniqueNumbers = removeDuplicates(numbers); //  
Returns [1, 2, 3, 4, 5]  
Summary: This function converts the array to a Set (which automatically removes  
duplicates) and then converts it back to an array.
```

These JavaScript coding exercises cover a range of common programming tasks and can help you practice your problem-solving and coding skills.