**Assignment 4: Algorithm Challenges**

**Task: Solve algorithmic challenges such as reversing a string, finding the longest word, and checking for palindrome strings.**

Below are solutions to three algorithmic challenges in JavaScript: reversing a string, finding the longest word in a sentence, and checking for palindrome strings.

1. Reverse a String:

| function reverseString(str) {  return str.split('').reverse().join('');  }  // Example usage  const originalString = "Hello, World!";  const reversedString = reverseString(originalString);  console.log(`Original String: ${originalString}`);  console.log(`Reversed String: ${reversedString}`); |
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2. Find the Longest Word:

| function findLongestWord(sentence) {  const words = sentence.split(' ');  let longestWord = '';  for (const word of words) {  if (word.length > longestWord.length) {  longestWord = word;  }  }  return longestWord;  }  // Example usage  const inputSentence = "The quick brown fox jumped over the lazy dog";  const longestWord = findLongestWord(inputSentence);  console.log(`Longest Word: ${longestWord}`); |
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3. Check for Palindrome Strings:

| function isPalindrome(str) {  const cleanStr = str.toLowerCase().replace(/[^a-z0-9]/g, ''); // Remove non-alphanumeric characters  const reversedStr = cleanStr.split('').reverse().join('');  return cleanStr === reversedStr;  }  // Example usage  const palindromeString = "A man, a plan, a canal, Panama!";  const isPalindromeResult = isPalindrome(palindromeString);  console.log(`String: ${palindromeString}`);  console.log(`Is Palindrome: ${isPalindromeResult}`); |
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In these solutions:

The reverseString function uses the split, reverse, and join array methods to reverse a string.

The findLongestWord function splits a sentence into words and iterates through them to find the longest word.

The isPalindrome function checks if a string is a palindrome by removing non-alphanumeric characters, converting it to lowercase, and comparing it to its reverse.