4.Valid Palindrome

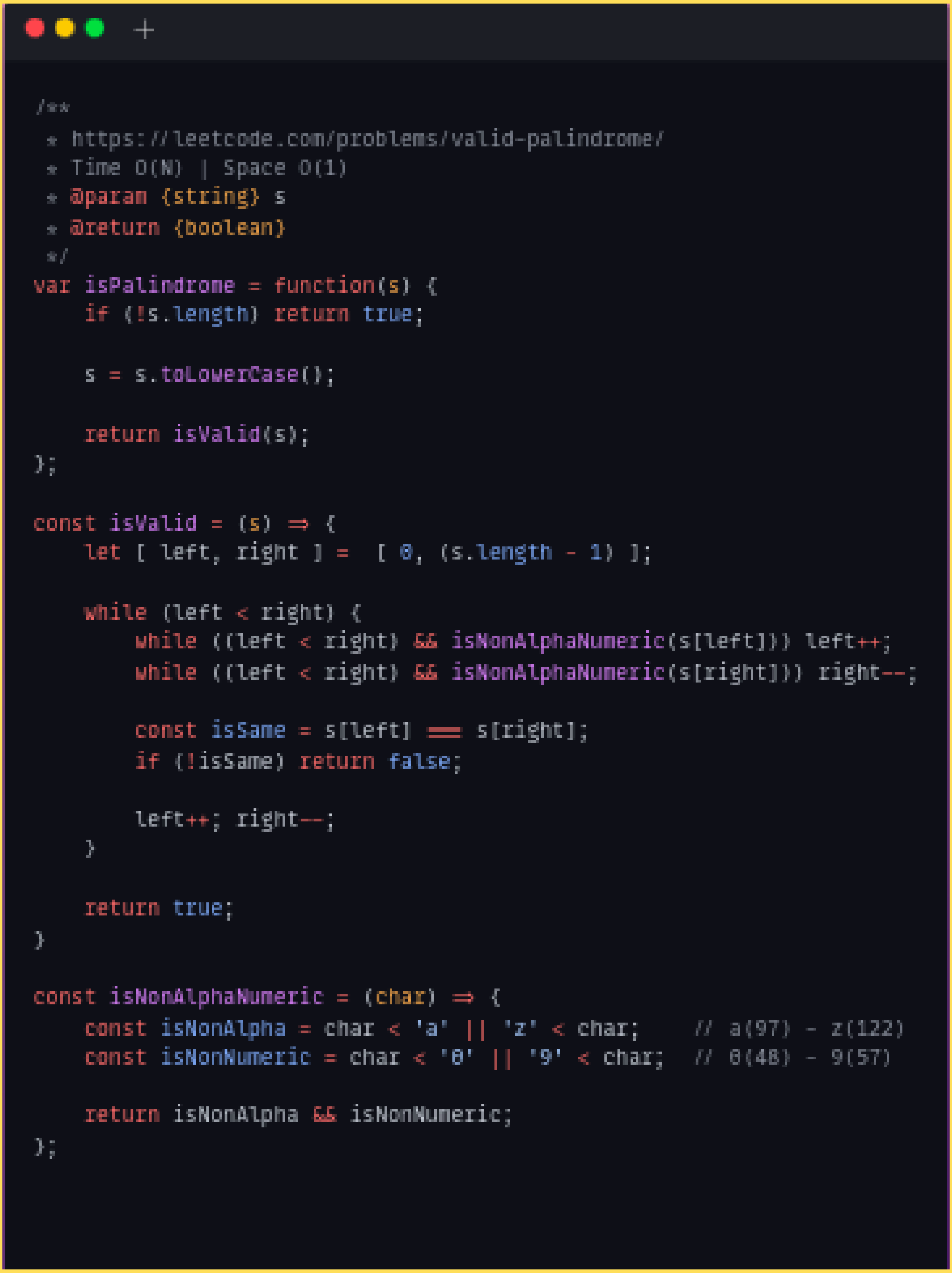
A phrase is a palindrome if, after converting all uppercase letters into lowercase letters and removing all non-alphanumeric characters, it reads the same forward and backward.
Alphanumeric characters include letters and numbers.
Given a string s, return true if it is a palindrome, or false otherwise.

Example 1:
Input: s = "A man, a plan, a canal: Panama"
Output: true
Explanation: "amanaplanacanalpanama" is a palindrome.

Example 2:
Input: s = "race a car"
Output: false
Explanation: "raceacar" is not a palindrome.

Example 3:
Input: s = " "
Output: true
Explanation: s is an empty string "" after removing non-alphanumeric characters.
Since an empty string reads the same forward and backward, it is a palindrome.

Solution



```
/**
 * https://leetcode.com/problems/valid-palindrome/
 * Time O(N) | Space O(1)
 * @param {string} s
 * @return {boolean}
 */
var isPalindrome = function(s) {
    if (!s.length) return true;

    s = s.toLowerCase();

    return isValid(s);
};

const isValid = (s) => {
    let [ left, right ] =  [ 0, (s.length - 1) ];

    while (left < right) {
        while ((left < right) && isNonAlphaNumeric(s[left])) left++;
        while ((left < right) && isNonAlphaNumeric(s[right])) right--;

        const isSame = s[left] === s[right];
        if (!isSame) return false;

        left++; right--;
    }

    return true;
}

const isNonAlphaNumeric = (char) => {
    const isNonAlpha = char < 'a' || 'z' < char;    // a(97) - z(122)
    const isNonNumeric = char < '0' || '9' < char;  // 0(48) - 9(57)

    return isNonAlpha && isNonNumeric;
};
```