

### Solve all questions

1. How do you determine if a string is a palindrome?
2. How do you calculate the number of numerical digits in a string?
3. How do you find the count for the occurrence of a particular character in a string?
4. Find an efficient algorithm to find the smallest distance (measured in number of words) between any two given words in a string.

*For example, given words "hello", and "world" and a text content of "dog cat hello cat dog dog hello cat world", return 1 because there's only one word "cat" in between the two words.*

5. Given a string, find the longest palindromic contiguous substring. If there are more than one with the maximum length, return any one.

*For example, the longest palindromic substring of "aabcdcb" is "bcdcb". The longest palindromic substring of "bananas" is "anana".*

6. Given a string consisting of parentheses, single digits, and positive and negative signs, convert the string into a mathematical expression to obtain the answer.

**Don't use `eval` or a similar built-in parser.**

*For example, given  $-1 + (2 + 3)$ , you should return 4.*

7. Given an integer  $k$  and a string  $s$ , find the length of the longest substring that contains at most  $k$  distinct characters.

*For example, given  $s = \text{"abcba"}$  and  $k = 2$ , the longest substring with  $k$  distinct characters is  $\text{"bcb"}$ .*