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+==========+
+Question 1+
+==========+

Given a string containing just the characters '(' and ')', find the length of the longest valid (well-formed) parentheses substring.

Example 1:

Input: str = "(()"
Output: 2
Explanation: The longest valid parentheses substring is "()".
Example 2:

Input: str = ")()())"
Output: 4
Explanation: The longest valid parentheses substring is "()()".
Example 3:

Input: str = ""
Output: 0

Constraints:

0 <= s.length <= 3 * 104
s[i] is '(', or ')'.

+==========+
+Question 2+
+==========+

Given an unsorted integer array nums, find the smallest missing positive integer.

Follow up: Could you implement an algorithm that runs in O(n) time and uses constant extra space.?

Example 1:
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Input: nums = [1,2,0]
Output: 3

Example 2:

Input: nums = [3,4,-1,1]
Output: 2

Example 3:

Input: nums = [7,8,9,11,12]
Output: 1

Constraints:

0 <= nums.length <= 300
-231 <= nums[i] <= 231 - 1

+==========+
+Question 3+
+==========+

Start from integer 1, remove any integer that contains 9 such as 9, 19, 29...

So now, you will have a new integer sequence:

1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, ...

Notice there's no digit 9 in the sequence.

Given a positive integer n, you need to return the n-th integer after removing. Note that 1 will be the first integer.

+==========+
+Question 4+
+==========+

Given a chemical formula (given as a string), return the count of each atom.

The atomic element always starts with an uppercase character, then zero or more lowercase letters, representing the name.

One or more digits representing that element's count may follow if the count is greater than 1. If the count is 1, no digits will follow. For example, H2O and H2O2 are possible, but H1O2 is impossible.

Two formulas concatenated together to produce another formula. For example, H2O2He3Mg4 is also a formula.

A formula placed in parentheses, and a count (optionally added) is also a formula. For example, (H2O2) and (H2O2)3 are formulas.

Given a formula, return the count of all elements as a string in the following form: the first name (in sorted order), followed by its count (if that count is more than 1), followed by the second name (in sorted order), followed by its count (if that count is more than 1), and so on.

Example 1:

Input: formula = "H2O"
Output: "H2O"
Explanation: The count of elements are {'H': 2, 'O': 1}.

Example 2:

Input: formula = "Mg(OH)2"
Output: "H2MgO2"
Explanation: The count of elements are {'H': 2, 'Mg': 1, 'O': 2}.

Example 3:

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Input: formula = "K4(ON(SO3)2)2"
Output: "K4N2O14S4"
Explanation: The count of elements are {'K': 4, 'N': 2, 'O': 14, 'S': 4}.


Example 4:

Input: formula = "Be32"
Output: "Be32"

Constraints:

1 <= formula.length <= 1000
formula consists of English letters, digits, '(', and ')'.
formula is always valid.
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+==========+
+Question 5+
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All DNA is composed of a series of nucleotides abbreviated as 'A', 'C', 'G', and 'T', for example: "ACGAATTCCG". When studying DNA, it is sometimes useful to identify repeated sequences within the DNA.

Write a function to find all the 10-letter-long sequences (substrings) that occur more than once in a DNA molecule.

Example 1:

Input: s = "AAAAACCCCCAAAAACCCCCCAAAAAGGGTTT"
Output: ["AAAAACCCCC","CCCCCAAAAA"]

Example 2:

Input: s = "AAAAAAAAAAAAA"
Output: ["AAAAAAAAAA"]

Constraints:

0 <= s.length <= 105
s[i] is 'A', 'C', 'G', or 'T'.