Probleme tutoriat 1

--Programarea algoritmilor—

1. Să se verifice dacă un șir de caractere t apare ca subșir într-un șir s, iar în caz afirmativ să se afiseze de cate ori apare sirul t in s. De exemplu, șirul t = "abc" apare ca subșir în șirul s = "$\underline{abc}c\underline{abc}ab\underline{abc}c$" de 3 ori.
2. Se citește un șir de caractere s. Să se verifice dacă există un șir t, diferit de s, astfel încât șirul s să se poată obține prin concatenarea de un număr arbitrar de ori k a șirului t. De exemplu, pentru s = ”$abcabc$” avem t = ”abc” și k = 2.
3. Primind un sir s, gasiti cel mai lung subsir care nu are duplicate si printati lungimea sa.

   Example 1:
   Input: s = "abcabcbb"
   Output: 3
   Explanation: The answer is "abc", with the length of 3. Note that "bca" and "cab" are also correct answers.
   Example 2:
   Input: s = "bbbbb"
   Output: 1
   Explanation: The answer is "b", with the length of 1.
   Example 3:
   Input: s = "pwwkew"
   Output: 3
   Explanation: The answer is "wke", with the length of 3.
   Notice that the answer must be a substring, "pwke" is a subsequence and not a substring.
4. Given a string s containing just the characters '(', ')', '{', '}', '[' and ']', determine if the input string is valid.
   An input string is valid if:
   Open brackets must be closed by the same type of brackets.
   Open brackets must be closed in the correct order.
   Every close bracket has a corresponding open bracket of the same type.

   Example 1:

Input: s = "()"
Output: true
Example 2:
Input: s = "()[]{}"
Output: true
Example 3:
Input: s = "(]"
Output: false
Example 4:
Input: s = "([])"
Output: true
Example 5:
Input: s = "([)]"
Output: false

5. Roman numerals are represented by seven different symbols: I, V, X, L, C, D and M.

Symbol	**Value**
I	1
V	5
X	10
L	50
C	100
D	500
M	1000

For example, 2 is written as II in Roman numeral, just two ones added together. 12 is written as XII, which is simply X + II. The number 27 is written as XXVII, which is XX + V + II.

Roman numerals are usually written largest to smallest from left to right. However, the numeral for four is not IIII. Instead, the number four is written as IV. Because the one is before the five we subtract it making four. The same principle applies to the number nine, which is written as IX. There are six instances where subtraction is used:

- I can be placed before V (5) and X (10) to make 4 and 9.
- X can be placed before L (50) and C (100) to make 40 and 90.
- C can be placed before D (500) and M (1000) to make 400 and 900.

Given a roman numeral, convert it to an integer.

Example 1:

Input: s = "III"
Output: 3
Explanation: III = 3.
Example 2:
Input: s = "LVIII"
Output: 58
Explanation: L = 50, V= 5, III = 3.
Example 3:
Input: s = "MCMXCIV"
Output: 1994
Explanation: M = 1000, CM = 900, XC = 90 and IV = 4.

6. Avand un sir s, gasiti cel mai lung subsir palindromic

Example 1:
Input: s = "babad"
Output: "bab"
Explanation: "aba" is also a valid answer.
Example 2:
Input: s = "cbbd"
Output: "bb"