

CyberChallenge.IT 2025

Programming Test

Keyboard [40 points]

Problem Statement

Lorenzo owns a very old keyboard, which can only type lowercase letters. Furthermore, he spilled some water on it yesterday, so the keys are acting weird now. Specifically, every time he types a string, one and exactly one of the keys does not work. By looking at some strings he typed, can you identify which key stopped working for each string?

Problem Details

You get a series of strings, each of them composed by lowercase letters only. The number of distinct letters in each string is 25. Find the missing character.

Input

The input consists of $2N + 1$ lines:

- Line 1: an integer, N , representing the number of strings
- Lines 2, ..., $2N + 1$: the length of each string as an integer followed by the string itself, alternated line by line, so that line 2 contains the length of the first string, line 3 contains the first string, line 4 contains the length of the second string, line 5 contains the second string, and so on.

Output

The output consists of N lines, each of them representing the broken key for the corresponding input string.

Scoring

Your program will be tested on a number of testcases grouped in subtasks. In order to obtain the score associated to a subtask, you need to correctly solve all its testcases.

Denoting with L the length of the strings:

- **Subtask 1** [20 points]: $L = 25, 30 \leq N \leq 50$
- **Subtask 2** [20 points]: $25 \leq L \leq 4000, 300 \leq N \leq 1000$

Examples

INPUT	OUTPUT
2	j
25	w
vfzascmtlngpeuyirxkowbdqh	
37	
rpogtvschbedjqmyliaxuzfnkdhryxkalrnqs	

Explanation

The input consists of two strings, respectively 25 and 37 characters long. We also know from the problem details that all strings contain 25 distinct characters. The only absent letter in the first string is the letter j; the only absent letter in the second string is the letter w. Therefore, they are the broken keys.