Hangman 2

John likes to play Hangman, the word guessing game. Today, however, he got really mad at the game. He arrived at the configuration `spi_e` , where finding the solution requires pure luck (solutions include `spice` , `spike` , `spine` and `spire`).

John is frustrated and argues that some words should never be chosen initially, namely words that differ from other words by **at most two letters**.

Task

Given a list of N distinct words, all of length K, print in alphabetical order those words from which no other word can be obtained by substituting **at most two letters**.

Clarification

Unlike classic Hangman, in this problem when John guesses a letter only one instance of the letter is revealed. For example, `spi_e` could hypothetically resolve to `spise` , whereas in classic Hangman guessing `s` would reveal both `s` 's, so `spi_e` would be an invalid configuration.

Standard input

The first line contains an integer T, the number of tests. The T tests follow. Each of them has the following structure:

- The first line contains two integer numbers N and K.
- Each of the following N lines contains a word of K small English letters.

Standard output

For each of the T tests print one line with the following structure:

- A sequence of N characters: the ith charater is `1` if the ith word can be obtained by substituting **at most two letters** from another or `0` if not and can be played in the game.

Constraints and notes

- $1 \leq T \leq 10$
- $1 \leq N \cdot K \leq 3 \cdot 10^4$

Subtask	Percentage of test cases	Additional input constraints
1	10%	$1 \leq T \leq 10$ $1 \leq N \cdot K \leq 3 \cdot 10^3$
2	90%	none

Input	Output	Explanation
1 7 5 spike speed choir spine chair chore spire	1011111	• spi_e could lead to spike, spine and spire • ch_ir could lead to chair and choir • cho__ could lead to choir and chore The only word that can be used in the game is: speed.