

The Devil

Input file: **standard input**
Output file: **standard output**
Time limit: 7 seconds
Memory limit: 1024 megabytes

People use abbreviations to express succinctly. This can lead to trouble when two phrases share the same abbreviation. For example, searching the term “CCPC” online, you will find not only the desired “China Collegiate Programming Contest”, but also “China Car Performance Challenge”, “Competition and Consumer Protection Commission”, etc.

However, nobody will drive a car while writing code. You decide to resolve the problem by assigning a distinct initialism-like abbreviation to every phrase you often use. There are n phrases, each consisting of some words in lowercase and uppercase English letters. To create an abbreviation for a phrase, a non-empty prefix of each word in the phrase is chosen and then concatenated in order. For example, “ChCoPrCo” and “CCPContest” are valid abbreviations for “China Collegiate Programming Contest”, but “CCCP” and “CCPiC” are not. Each phrase is abbreviated independently from the other phrases: the same word can be abbreviated differently in different phrases.

Construct an abbreviation scheme so that the total length of all abbreviations is minimized, while ensuring n abbreviations are distinct.

Input

The first line of input contains an integer n ($1 \leq n \leq 128$), representing the number of phrases.

The next n lines each contain a non-empty phrase consisting of no more than 128 non-empty words separated by single spaces. Each word consists of no more than 128 lowercase and uppercase English letters only. It is guaranteed that no two phrases are identical.

Output

If there is no possible solution, print “no solution” in a single line.

Otherwise, print n lines where the i -th line contains the abbreviation of the i -th phrase in the solution, in the order given by input. If there are multiple solutions, print any.

Examples

standard input	standard output
5 automated teller machine active teller machine active trouble maker always telling misinformation American Teller Machinery	atm atma actm atem ATM
5 Forest Conservation Committee Forum Fuming Corruption Collusion Federation Fulsome Cash Concealment Foundation Funky Crony Capitalism Facilitator Funny Cocky Cocky Funny	FCCF FCoCF FuCCF FCCFa FCCFu
3 A AA AA A A A A	no solution