Problem K: Digraphs

A *digraph* is a graph with orientation... oh, sorry, not this time. Let's stop being nerds for a minute and talk about languages (*human* languages, not PHP).

Digraphs are pairs of characters that represent one phoneme (sound). For example, "ch" in English (as in "church") is a single consonant sound. The languages of Central Europe are fond of digraphs: Hungarian "sz", Czech "ch" and Polish "rz" are fine examples of them.

Digraphs are very annoying for people who do not use them natively. We will make up a letter-puzzle specifically for those people. Given a list of digraphs, construct a biggest possible square of lower case English letters such that its rows and columns *do not* contain any of these digraphs. This means that no two consecutive letters (read from top to bottom or from left to right) can form a digraph.

Input

The first line of input contains the number of test cases T. The descriptions of the test cases follow:

Each test case starts with an integer n, $0 \leqslant n \leqslant 676$, denoting the number of forbidden digraphs. The n following lines contain the digraphs.

Output

For each test case print a square of the largest possible size which does not contain any of the digraphs. If it is possible to construct a square of size 20×20 or bigger, print only a 20×20 square.

Example

Part of the example test data below was omitted for clarity. You can access full sample tests at your workstation.

For an example input	a possible correct answer is:
2 628 aa az ba bb bc ... by ca cb cc ... cy da ... dy ... wa ... wy ya ... yy za zb ... zy zz 2 aa bb	aw wz abababababababababab bababababababababa abababababababababab bababababababababa abababababababababab bababababababababa abababababababababab bababababababababa abababababababababab bababababababababa abababababababababab bababababababababa abababababababababab bababababababababa abababababababababab bababababababababa abababababababababab bababababababababa