G - Become a Millionaire... With Software Patents!

Background

The thinking heads of the country have invented a new method of making money, lots of money: software patents. You only have to patent any simple, insignificant and trivial piece of source code. Then, every time someone happens to write the patented lines, you charge him/her a 1000 euros fee.

The Problem

We have a set of programs, in source code. For simplicity, program instructions are denoted with capital letters: *A*, *B*, *C*, ..., *Z*. All programs end with a symbol #. We want to make as much money as possible by patenting a sequence of 3 instructions.

Your task is to find the most frequent sequence of 3 instructions in the available set of programs. Supposing we make 1000 euros for each use of our patented piece of code, how much money are we going to get from those programs?

The Input

The first line of the input contains an integer *N*, indicating the number of test cases. Each test case consists of a set of programs. The first line of each case contains an integer, *M*, indicating the number of programs. *M* lines follow, each one with a program. Each program consists of a sequence of uppercase letters, from *A* to *Z*, ending with a symbol #.

The Output

For each test case, you should output the line:

`PATENT` *XXX* `AND WIN` *K* `EUROS!`

where *XXX* indicates the sequence of three letters most repeated in that case (there will be, at least, a sequence of 3 letters in the existing programs). If there is more than one possibility, you have to output the alphabetically first. *K* is an integer number, indicating the total amount of money, in euros, we win with the patent.

Sample Input

```
3
1
AAANNNNAAANNNNAAANNNN#
2
ABABABBABABABABABABABB#
ABABABABABABAABABBBABABABAB#
5
ZD#
DOJIOAAJIOFJIOASJ#
ASJKKJASFJLAJKLAFJAJLFFAJKLS#
ZASJKDFHFHKHKLAFSKLHFHKLAF#
DJKHAKJHASHKAKHADHKLADHKLAKH#
```

Sample Output

```
PATENT NNN AND WIN 6000 EUROS!
PATENT BAB AND WIN 19000 EUROS!
PATENT KLA AND WIN 5000 EUROS!
```