Problem B
Wizard Merlin

Input File: *testdata.in*
Time Limit: 10 seconds

Problem Description

In Athurian Legend, there's a young wizard whose name is Merlin. After he arrived in the kingdom of Camelot, he worked as the prince Arthur's main servant. Before becoming the most powerful wizard, he received lots of hints from the Great Dragon who knew the secret of the past and the future of the kingdom. Every time Merlin encountered challenges, he turned to the Great Dragon for essential inspirations. Then he came up with some incantations which are particular words spoken or written to yield magic effects.

An incantation contains several words composed of English alphabet, for example, *Cixa Yayazu Dize Peyi Raxu*. Every word starts with an upper-case letter and ends with a lower-case vowel. In the middle of each word are one or more pairs of lower-case letters, which consist of one vowel in the front and one consonant in the back. Within each single word, there's no duplicate lower-case consonant. (In English alphabet, the letters a, e, i, o and u are so called vowels, while the others are consonants.)

Chances are we can know the name of the person whom the incantation aims to secure and forecast whether it is strong enough or not. The rules of uncovering the hidden secrets are:

1. The upper-case letters are key letters to unveil the name.
2. The lower-case letters implicitly stand for magic equations.
   (a) The vowels a, e, i, o and u mean five numbers 1, 2, 3, 4 and 0 respectively.
   (b) The consonants represent variables of equations.

(c) Those numbers before variables are coefficients, and those numbers at the end are constant terms.

Take the first word *Cixa* for example, the key letter is C and the magic equation is *3x=1*. Repeatedly doing this way, we'll have key letters C, Y, D, P and R and the magic equation set

$$\begin{cases} 3x = 1 \\ y + z = 0 \\ 3z = 2 \\ 2y = 3 \\ x = 0 \end{cases}$$

To find the name of the person, we need to shift the key letters. The sum of the coefficients and the constant in the correlate equation is the shift quantity. Take the letter C and the equation *3x=1* for instance, the sum of coefficients and solution is 4. So we shift C right by 4, and then we get the transformed letter G. As to the second word, the key letter is Y and the shift quantity is 2 so the transformed letter is A. Finally, we can obtain G, A, I, U and S. Therefore the name is *GAIUS*.

To predict the power of the magic effect, we need to create an augmented matrix to represent the coefficients and the constant terms of the equation set. If the number of zeros is odd, the magic effect is strong enough. Otherwise, it is weak. In this example, the augmented matrix is

$$\begin{pmatrix} 3 & 0 & 0 & 1 \\ 0 & 1 & 1 & 0 \\ 0 & 0 & 3 & 2 \\ 0 & 2 & 0 & 3 \\ 1 & 0 & 0 & 0 \end{pmatrix}$$

In the matrix, there are 11 zeros; that is, the number of zeros is odd. Hence the magic effect is strong enough.

Technical Specifications

1. The number of test cases would be smaller than or equal to 10.
2. The number of words is a positive integer and would be smaller than or equal to 10.

3. The number of variables in the equation set is a positive integer and would be smaller than or equal to 5.

Input Format

The first line of the input contains an integer indicating the number of test cases. Each test case contains one line of several strings, separated by spaces.

Output Format

The output contains one line for each test case. Each line contains one word. If the magic effect is strong enough, output the name. Otherwise, output MAGIC.

Sample Input

```
2
Cixa Yayazu Dize Peyi Raxu
Vateqimosa Pemise Vomesi Hiqemasu
```

Sample Output

```
GAIUS
MAGIC
```