

7455 Linear Ecosystem

An ecosystem is a community of living organisms in conjunction with the nonliving components of their environment (things like air, water and mineral soil), interacting as a system. A sustainable ecosystem is vital for human to immigrate to other planets. To simplify the matter, the concept of linear ecosystem is proposed. In a linear ecosystem living organisms and nonliving components are all called *comorg* and the number of comorgs in the system is a fixed constant, k . A unified measurement, *mass equivalence*, is developed to quantify the presence of each comorg.

Therefore, the state of the ecosystem can be described as k -tuple with the values of the mass equivalence of the k comorgs. The whole ecosystem changes state at discrete time steps, that is the value of the mass equivalence of every comorg changes at the same time. And the mass equivalence of any comorg at next time step is determined by a linear combination of the mass equivalence of all comorgs at the current step.

Therefore a linear ecosystem can be described as (C, E) , where $C = \{c_1, c_2, \dots, c_k\}$ is the set of comorgs, and $E = \{e_1, e_2, \dots, e_k\}$ is the set of linear transition equations for these k comorgs, where $e_i = (\alpha_{i,1}, \alpha_{i,2}, \dots, \alpha_{i,k})$.

For example, the value of the mass equivalence of i -th comorg at time step $t+1$, denoted by $c_i(t+1)$, is determined by the following equation: $c_i(t+1) = \sum_{j=1}^k \alpha_{i,j} c_j(t)$. A state of an ecosystem is the k -tuple (c_1, c_2, \dots, c_k) . Note that we do not require c_i to be positive. We say that a state, s , is stable if the state after the transition is still s . Apparently the empty state, that is the state that all comorgs have zero mass equivalence, is always stable but meaningless. We say an ecosystem is potentially stable if there exist a non-empty stable state. Please write a program to decide if an linear ecosystem is potentially stable.

Technical Specification

1. The number of comorgs is at most 10.
2. $-100 < \alpha < 100$ and has at most two digits after the decimal point.
3. There are at most 20 test cases.

Input

The first line of the input file contains an integer, n , which is the number of ecosystems. For each case, the first line contains the integer k which is the number of comorgs. Followed by k lines, where the i -th line contains, $\alpha_{i,1}, \alpha_{i,2}, \dots, \alpha_{i,k}$, the coefficients of the transition equation for c_i .

Output

For each test case, output '1' if the ecosystem is potentially stable, otherwise output '0'. Output only 5 answers per line. There should be a blank space between any two output answers.

Sample Input

```
6
2
4 -2
-6 5
2
```

```
2 2
0 0
3
0.3 0.2 0.5
0.4 0.4 0.2
0 0.8 0.2
3
0.3 0.2 0.5
0 0 0
0 0.8 0.2
2
4 2.0
-6 5
2
1 0
0 1
```

Sample Output

```
1 0 1 0 0
1
```