Famed investigator Paula Myo, working on behalf of the 2011 established Commonwealth government, is determined to stop the Starflyer from spying. The Starflyer is a "human-friendly" and powerful alien sentinel intelligence that was found by a space exploration frigate in the Dyson Alpha solar system in year 2285. It is not clear what the Starflyer's real intentions are towards the Commonwealth ... so, it is always better to be safe than sorry!!!

The Starflyer has the ability to control technological equipment; it typically infiltrates droids and uses them as agents. As a matter of fact, droids are carefully identified and tracked in the Commonwealth. Every droid has a history of software updates and each software update is tagged with a hash. A *hash* is a term built recursively from variable, constant, and function symbols as follows:

- any variable and any constant is a hash;

- if each $h_1, \ldots, h_k$ is a hash and f is a function symbol, then $f(h_1, \ldots, h_k)$ is a hash.

As a security measure, a well-kept secret from the general population, the Commonwealth enforces the following policy on droid software updates: for each droid, the tags of any software updates must be compatible. Two hashes h_1 and h_2 are *compatible* if there is a mapping θ from variables to hashes such that $h_1\theta = h_2\theta$, where $h_1\theta$ (resp., $h_2\theta$) denotes the simultaneous replacement of any occurrence of each variable x in h_1 (resp., h_2) with the hash $\theta(x)$. A sequence of hashes $h_1, \ldots, h_n$ is *compatible* if there is θ such that $h_1\theta, \ldots, h_n\theta$ are all equal.

For example, assume that X, Y, Z are variables, c, d are constants, and f, g are function symbols, and consider the hashes h_1, h_2, and h_3 as follows:

$$h_1 : f(X, g(c)) \qquad h_2 : f(f(Y), Z) \qquad h_3 : f(c, g(Y, d))$$

Observe that h_1 and h_2 are compatible because the mapping $\theta = \{X \mapsto f(Y), Z \mapsto g(c)\}$ satisfies $h_1\theta = h_2\theta$. However, any other pair from h_1, h_2, and h_3 is not compatible. Therefore, any sequence of hashes containing h_1, h_2, and h_3 is not compatible because there is no mapping θ such that $h_1\theta = h_2\theta = h_3\theta$.

Detective Myo has just been briefed on the aforementioned security policy. She strongly believes that the Starflyer infiltrates the droids via software updates without having any knowledge of the security policy. If her intuition is right, then this is the chance to detect and stop some Starflyer agents. You have been assigned to Myo's team: your task is to write an algorithm for determining if a sequence of hashes is compatible or not.

Can you help Detective Myo to uncover the Starflyer agents?

Input

The input consists of several test cases. The first line of each test case contains a string *name* and a natural number n separated by a blank ($2 \leq n \leq 20$, $1 \leq |name| \leq 16$). Then n lines follow, each containing a hash h_i ($1 \leq i \leq n$, $1 \leq |h_i| \leq 512$). You can suppose that:

- The *name* is an alphanumeric text (without blanks) that has a length less than or equal to 16 characters.

- Each one of the n hashes was built according to the above definition and has a length less than or equal to 512 characters.

- The variables, constants, and function symbols are formed exclusively from alphabetic characters. The first character of a variable symbol is an uppercase letter and the first character of a constant or function symbol is a lowercase letter.

The last test case is followed by a line with the text "END 0".

Output

For each test case, a line must be printed. If the sequence of hashes $h_1, \ldots, h_n$ is compatible, then print the line

```
analysis inconclusive on XXX
```

or if the sequence of hashes $h_1, \ldots, h_n$ is not compatible, then print the line

```
XXX is a Starflyer agent
```

where XXX corresponds to *name* in the test case.

Sample Input

```
r2d2 3
f(X,g(c))
f(f(Y),Z)
f(c,g(Y,d))
c3po 2
f(X,g(c))
f(f(Y),Z)
PC2 2
f(f(Y),Z)
f(c,g(Y,d))
END 0
```

Sample Output

```
r2d2 is a Starflyer agent
analysis inconclusive on c3po
PC2 is a Starflyer agent
```