Problem F
Never Wait for Weights

Input: Standard Input
Time Limit: 15 seconds

In a laboratory, an assistant, Nathan Wada, is measuring weight differences between sample pieces pair by pair. He is using a balance because it can more precisely measure the weight difference between two samples than a spring scale when the samples have nearly the same weight.

He is occasionally asked the weight differences between pairs of samples. He can or cannot answer based on measurement results already obtained.

Since he is accumulating a massive amount of measurement data, it is now not easy for him to promptly tell the weight differences. Nathan asks you to develop a program that records measurement results and automatically tells the weight differences.

Input

The input consists of multiple datasets. The first line of a dataset contains two integers N and M. N denotes the number of sample pieces ($2 \leq N \leq 100,000$). Each sample is assigned a unique number from 1 to N as an identifier. The rest of the dataset consists of M lines ($1 \leq M \leq 100,000$), each of which corresponds to either a measurement result or an inquiry. They are given in chronological order.

A measurement result has the format,

`!` a b w

which represents the sample piece numbered b is heavier than one numbered a by w micrograms ($a \neq b$). That is, $w = w_b - w_a$, where w_a and w_b are the weights of a and b, respectively. Here, w is a non-negative integer not exceeding 1,000,000.

You may assume that all measurements are exact and consistent.

An inquiry has the format,

`?` a b

which asks the weight difference between the sample pieces numbered a and b ($a \neq b$).

The last dataset is followed by a line consisting of two zeros separated by a space.

Output

For each inquiry, `?` a b, print the weight difference in micrograms between the sample pieces numbered a and b, $w_b - w_a$, followed by a newline if the weight difference can be computed based on the measurement results prior to the inquiry. The difference can be zero, or negative as well as positive. You can assume that its absolute value is at most 1,000,000. If the difference cannot be computed based on the measurement results prior to the inquiry, print `UNKNOWN` followed by a newline.

Sample Input

```
2 2
! 1 2 1
? 1 2
2 2
! 1 2 1
? 2 1
4 7
! 1 2 100
? 2 3
! 2 3 100
? 2 3
? 1 3
! 4 3 150
? 4 1
0 0
```

Output for the Sample Input

```
1
-1
UNKNOWN
100
200
-50
```