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This is an interactive problem.

It is well-known that the precise strength of Earth's gravity varies with location. Alice and Bob live in different countries, and they want to do experiments to verify this fact. First, the friends decide to meet up in Vietnam, and each of them will buy the same scale there. Then they fly back to their countries and prepare some weights, making sure that the scale shows exactly 1KG for each of the weights. Finally, they fly to Vietnam again, and this time compare their weights. Sure enough, when putting one of Bob's weights and one of Alice's weights onto different sides of a balance scale, the scale is not balanced!

After doing the experiment all day, the friends decide to take a break. However, since they do not clean up, when going back, Alice and Bob do not know which weights are whose. They also do not remember the amount of weights each of them bring either, as there are a lot of weights. Now the friends need to clean up and bring home their weights. Here is the summary of what is known by Alice and Bob:

- There are exactly 2^n weights, numbered from 1 to 2^n, indistinguishable from each other;
- Each of the friends brings at least one weight;
- All weights brought by Alice have the same weight;
- All weights brought by Bob have the same weight;
- Alice's weights' weight are different from Bob's weights' weight;
- The number of Alice's weights is **less than or equal to** the number of Bob's weights.

They want to start by figuring out the number of weights each of them bring. To do so, they use the same balance scale. In one operation, they can put some of the weights on each side of the balance scale and observe one of the following results:

- The left side is heavier;
- The right side is heavier;
- The scale is balanced.

Please help the friends find the number of weights brought by Alice, using no more than n^2 operations.

Interaction Protocol

Each test contains multiple test cases. Your program read the number of test cases τ ($1 \le \tau \le 1000$). For each test case, your program interact with the jury's program as follows.

First, your program read the integer n ($1 \le n \le 10$) meaning that the total number of weights the friends have is 2^n.

Then, your program can use the scale as follows:

- On the first line, print ? cnt_l cnt_r ($1 \le cnt_l, cnt_r$; $cnt_l + cnt_r \le 2^n$) – the number of weights to put onto the left side and the right side of the balance scale, respectively;

- On the next line, print cnt_l numbers $l_1, l_2, \ldots, l_{cnt_l}$ ($1 \le l_i \le 2^n$) – the indices of the weights to put on the left side of the balance scale;
- On the next line, print cnt_r numbers $r_1, r_2, \ldots, r_{cnt_r}$ ($1 \le r_i \le 2^n$) – the indices of the weights to put on the right side of the balance scale;

  All $cnt_l + cnt_r$ integers $l_1, l_2, \ldots, l_{cnt_l}, r_1, r_2, \ldots, r_{cnt_r}$ must be distinct.
- Then read a character c ($c \in \{>, =, <\}$) – the balance scale result:
  - If $>$ is read, the left side is heavier;
  - If $<$ is read, the right side is heavier;
  - If $=$ is read, the scale is balanced.

When your program knows k – the number of weights that Alice brings, print ! k, then continue with the next test case, or terminate the program when there are no more test cases. Printing this does not count towards the number of operations limit.

It is guaranteed that the sum of 2^n over all test cases does not exceed 5000.

The jury's program is **not adaptive**. The weight and the owner of each weight is known by the jury's program before the interaction and will not be changed during the interaction process.

After printing each query do not forget to output the end of line and flush[1] the output.

[1]To flush, use:
- `fflush(stdout)` or `cout.flush()` in C++;
- `sys.stdout.flush()` in Python;
- see the documentation for other languages.

Sample Interaction

Stdin	Stdout	Comment
2		The number of test cases
	Test case 1	
1		$n = 1$, so there are $2^n = 2^1 = 2$ weights in total
	? 1 1	Put 1 weight onto the left side, and 1 weight onto the right side of the scale
	1	Put the 1-st weight onto the left side.
	2	Put the 2-nd weight onto the right side.
<		The right side is heavier.
	! 1	Answer that Alice brings $k = 1$ weights
	Test case 2	
2		$n = 2$, so there are $2^n = 2^2 = 4$ weights in total
	? 2 2	Put 2 weights onto the left side, and 2 weights onto the right side of the scale
	1 4	Put the 1-st and 4-th weights onto the left side.
	2 3	Put the 2-nd and 3-rd weights onto the right side.
<		The right side is heavier.
	? 1 1	Put 1 weight onto the left side, and 1 weight onto the right side of the scale
	1	Put the 1-st weight onto the left side.
	3	Put the 3-rd weight onto the right side.
=		Both sides have the same weight.
	! 1	Answer that Alice brings $k = 1$ weights

The example interaction only shows how your program and the jury's program interact with each other, and does not show how the answer is deduced.

In the first test case, there are 2 weights. Since each friend bring at least 1 weight, Alice must have brought 1 weight.

In the second test case, suppose that one of Alice's weights is 1.01 KG, and one of Bob's weights is about 0.99 KG. Alice brings the 2-nd weight, while Bob brings the 1-st, 3-rd, and 4-th weights:

- In the first operation, the sum of the 1-st and 4-th weights ($0.99 + 0.99 = 1.98$ (KG)) is less than the sum of the 2-nd and 3-rd weights ($1.01 + 0.99 = 2$ (KG)).
- In the second operation, the 1-st weight and the 3-rd weight have the same weight (0.99 (KG)).

The observations result is consistent with the fact that Alice brings only the 2-nd weight.

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