Doubt VS Lie

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 megabytes

Doubt VS Lie is a kind of poker game. Initially, there are 4 players denoted by $0, 1, 2, 3$. For player x define $S(x)$ as the set of cards he/she holds currently. At the very beginning $|S(x)| = 13, 0 \leq x \leq 3$, for every $0 \leq x, y \leq 3, x \neq y, S(x) \cap S(y) = \emptyset$. $\bigcup S(x)$ is exactly a deck without two Jokers. As you will know later, the suit of cards doesn't matter in this game. So, you can assume $\bigcup S(x)$ contains exactly 4 Ace, 4 Two, 4 Three, ..., 4 Queen and 4 King. For convenience, in the input/output and the following statement, we denote Ace by "1", Jack by "11", Queen by "12", King by "13" and others by their number (2 to 10).

The process of the game is as follows:

1. First, player 0 chooses an $x(1 \leq x \leq 13)$ and arbitrarily $y(1 \leq y \leq |S(0)|)$ cards in his/her hand, playing these y cards with the back facing up on the desk and then state "These are y pieces of card x".
2. When player p has done his/her operation, it comes to the turn of player q ($q = (p + 1) \bmod 4$).
   (a) If player p played cards and stated "These are y pieces of card x", the player q can choose:
      i. To play arbitrarily $z(1 \leq z \leq |S((p + 1) \bmod 4)|)$ cards in his/her hand with the back facing upon the desk and then state "These are z pieces of card x". Note that x should equal to what player p stated.
      ii. Not to play cards and call into question. Then he will flip over the card the player p has played and check if his/her statement is true. If it's true, the doubt is failed and player q should take all the cards on the desk into his/her hand. Otherwise, the doubt is successful and player p should take all the cards on the desk into his/her hand.
   (b) If player p called a question, whether the doubt was successful, player q choose an $x(1 \leq x \leq 13)$ and arbitrarily $y(1 \leq y \leq |S(q)|)$ cards in his/her hand, playing these y cards with the back facing up on the desk and then state "These are y pieces of card x" like player 0 did initially. Note that at this time x can be chosen arbitrarily.
3. When a player chooses to call a question, after someone takes all the cards on the desk, if somebody has no cards in his/her hand, then we say that player wins the game.

For simplification, this time you need to write a program only to simulate the game process.

Input

Firstly 4 lines, the i-th line contains 13 numbers, indicating the cards player $(i - 1)$ has in hand.

Then one line contains an integer m ($2 \leq m \leq 20$), denoting the turns of the game. The next m lines, each of which is one of the following formats (without quotes):

1. "S x y a_1 a_2 ... a_y", meaning that the current player plays card $a_1, a_2, \cdots, a_y$ and stated "These are y pieces of card x".
2. "! y a_1 a_2 ... a_y", meaning that the current player chooses not to call a question and played y cards $a_1, a_2, \cdots, a_y$ and states "These are y pieces of card x" where x remains the same.
3. "?", meaning that the current player chooses to call a question.

Tests guarantees that all the operations are legal. And in the process, nobody will win the game.

Output

Four lines, the i-th line contains the cards of player $(i-1)$ after m turns in non-decreasing order.

Examples

standard input	standard output
8 12 12 9 3 10 13 11 12 4 10 2 1 2 10 13 9 9 3 12 4 6 13 3 11 13 11 1 10 5 7 4 5 6 7 7 5 6 9 4 1 11 2 1 8 8 3 2 6 5 8 7 5 S 1 2 2 3 ! 1 2 ! 1 1 ! 2 1 1 ?	1 1 1 1 2 2 3 4 8 9 10 10 11 12 12 12 13 3 3 4 6 9 9 10 11 12 13 13 13 4 5 5 5 6 6 7 7 7 9 10 11 2 2 3 4 5 6 7 8 8 8 11
8 12 12 9 3 10 13 11 12 4 10 2 1 2 10 13 9 9 3 12 4 6 13 3 11 13 11 1 10 5 7 4 5 6 7 7 5 6 9 4 1 11 2 1 8 8 3 2 6 5 8 7 6 S 1 2 2 3 ! 1 2 ! 1 1 ! 2 1 1 ! 1 1 ?	4 8 9 10 10 11 12 12 12 13 1 1 1 1 2 2 3 3 3 4 6 9 9 10 11 12 13 13 13 4 5 5 5 6 6 7 7 7 9 10 11 2 2 3 4 5 6 7 8 8 8 11
8 12 12 9 3 10 13 11 12 4 10 2 1 2 10 13 9 9 3 12 4 6 13 3 11 13 11 1 10 5 7 4 5 6 7 7 5 6 9 4 1 11 2 1 8 8 3 2 6 5 8 7 8 S 3 1 3 ! 2 2 4 ! 1 4 ? S 4 1 2 ! 1 3 ! 1 4 ?	1 4 8 9 10 10 11 12 12 12 13 3 6 9 9 10 11 12 13 13 13 1 2 3 4 5 5 5 6 6 7 7 7 9 10 11 1 1 2 2 2 3 3 4 4 5 6 7 8 8 8 11