

Card game

Description

Kyaru is playing a card game with her friends and the game rules are as follows.

1. The game is played around a card queue on the table. The players add cards to the back of the queue and collect cards from the queue.
2. Initially, each player has l cards in his hand, and the card queue is empty. A special number s is set.
3. In each round, players take actions in order. Each player displays the first card in his hand, adding it to the back of the queue. Then he may be able to collect cards from the queue following the rules below:
 - If the card displayed is numbered s and the card queue is **not empty** before this card is added, he collects all the cards from the front to the back of the queue into his hand in order.
 - If the card displayed is numbered $x \neq s$, and there's another card also numbered x in the queue, collect all the cards from the earlier card x to the back of the queue into his hand in order.
 - Otherwise, he cannot collect any cards.
4. If a player has no cards in his hand **after a round**, he is out of the game. If there is no more than one player left **after a round**, the game is over.

For example, if a player is playing this game on his own (just for demonstration, the actual game will end when there is only one player left), assume the special number is 1, the cards in the queue is $[3, 4, 7, 8]$, the cards in a player's hand are $[4, 5, 1, 1, 6]$ in order, and he displays cards and adds cards to the card queue following the rule,

1. He displays the first card 4 and adds it to the back of the queue, and the queue becomes $[3, 4, 7, 8, 4]$. Since there's another 4 in the queue, he collects $[4, 7, 8, 4]$ into his hand. Then, the queue becomes $[3]$ and the cards in his hand becomes $[5, 1, 1, 6, 4, 7, 8, 4]$.
2. He displays the first card 5 and adds it to the back of the queue, and the queue becomes $[3, 5]$. Since there's no other 5 in the queue, he cannot collect any cards, and the cards in his hand becomes $[1, 1, 6, 4, 7, 8, 4]$.
3. He displays the first card 1 and adds it to the back of the queue, and the queue becomes $[3, 5, 1]$. Since the card he displayed is special number 1, he collects all the cards in the queue into his hand in order. Then, the queue becomes empty and the cards in his hand becomes $[1, 6, 4, 7, 8, 4, 3, 5, 1]$.
4. He displays the first card 1 and adds it to the back of the queue, and the queue becomes $[1]$. Since the queue is empty before his action, he cannot collect any cards and the cards in his hand becomes $[6, 4, 7, 8, 4, 3, 5, 1]$.

In this question, we use the integer in $[1, m]$ to represent each card. n players are going to participate in the game, and the initial number of cards in each player's hand is l . Given initial status of the game, you are asked to predict the players' status after T rounds.

Input

The input contains multiple test cases, ended by $n = m = l = s = T = -1$.

For each test case, the first line of the input contains n, m, l, s, T mentioned above. Then each of the following n lines contains l numbers in $[1, m]$, the i -th line of which indicates the initial cards in the i -th player's hand in order.

Output

The output contains $n + 1$ lines for each test case.

The first line contains n integers, indicating the number of cards in each player's hand after T rounds of the game. If a player is out after the i -th round before the T -th rounds, output $-i$ instead of the number of cards.

In the next n lines, for the i -th line, please output the cards in the i -th player's hand after T rounds of the game in order, simply output a blank line if he has been out.

If the game is over before the T -th rounds, output the status after the last round of the game.

Sample Input/Output

Input

```
2 3 5 2 5
1 2 3 3 3
3 2 1 3 1
-1 -1 -1 -1 -1
```

Output

```
8 -5
1 3 2 3 1 3 3 3
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Explanation

Please note that the special number is 2 in this test case.

Round	Card queue	First player	Second player
0		1 2 3 3 3	3 2 1 3 1
1.1	1	2 3 3 3	3 2 1 3 1
1.2	1 3	2 3 3 3	2 1 3 1
2.1		3 3 3 1 3 2	2 1 3 1
2.2	2	3 3 3 1 3 2	1 3 1
3.1	2 3	3 3 1 3 2	1 3 1
3.2	2 3 1	3 3 1 3 2	3 1

Round	Card queue	First player	Second player
4.1	2	3 1 3 2 3 1 3	3 1
4.2	2 3	3 1 3 2 3 1 3	1
5.1	2	1 3 2 3 1 3 3 3	1
5.2	2 1	1 3 2 3 1 3 3 3	

$x.y$ in Round represents the status of the x -th round, after the y -th player's action.

Constraints

For all test data,

$$2 \leq n \leq 100, 1 \leq m \leq 10^9, 1 \leq l \leq 100, 1 \leq s \leq m, 0 \leq T \leq 3 \cdot 10^5, \sum T \leq 10^6$$

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