# The Dishonest Casino

(Time Limit: 3 seconds)

**Problem Description**

Mr. Poker is spending his vocation in a casino for couple weeks. He is playing a poker game in which an initial number of cards are issued to each player by a dealing machine. Then, each player can ask for more cards if requested. He noticed that, although each player receives different hands of cards initially, the next card issued to each player looks completely predictable by the dealer. He then realized the initial cards issued by the dealing machine has given the dealer clues of upcoming sequence of cards. Therefore, there is little or no chance for the players to win. Mr. Poker decided to discover the clues known by the dealer.

For simplicity, we assume the cards only range from 1, 2, …, 9, H, I, J, K and each card can be repeatedly issued. Before starting each round of play, the dealing machine has been set up for assigning a specific sequence of cards to each distinct player. In order to hide this secret, the rotations of these sequences are first generated and sorted. For example, given two sequences (of three cards) to be issued to two players: (3, 2, 9) and (J, 7, K). The rotated sequences are (3, 2, 9), (2, 9, 3), (9, 3, 2), (J, 7, K), (7, K, J), and (K, J, 7). The rotated sequences are then sorted according to the first card, then second card, until the last card in each sequence, leading to (2, 9, 3), (3, 2, 9), (7, K, J), (9, 3, 2), (J, 7, K), and (K, J, 7). The last card in the sorted sequences (3, 9, J, 2, K, 7) will be issued to the two players. That is, the first player gets an initial hand of cards (3,9,J) and the second player gets (2,K,7).

However, even knowing this rule, Mr. Poker still can’t figure out why the dealer is able to predict the upcoming sequence of cards solely from the initial hands of cards. Later, he observed a tiny LED light of the dealing machine flashes when dealing the 2nd and 5th cards, which tells the dealers that the upcoming sequences of cards issued to the 1st and 2nd players will end with the 2nd and 5th cards, respectively. Mr. Poker then smile, because now he knows all the secrets.

Given initial hands of cards of multiple players, and the indices of ending cards (of upcoming sequences) to each player, write a program that helps Mr. Poker compute the secret sequences of cards to be issued to all players (i.e., (3,2,9) and (J,7,K)).

**Technical Specification**

* + The total number of cards issued initially (*N*) is from 1 to 400.
  + The number of players ranges (*P*) between 1 and 20.
  + Each player initially receives the same number of cards (*I*) ranging from 1 to 20 at each run. The total number of cards issued to all players initially will not exceed *N* (i.e., *P\*I<=N*).
  + Each card is from 1, 2, 3, …, 9, H, I, J, K, where 1 < 2 < …< 9 < H < I < J < K.
  + The index of ending card for each player is from 1 to *N*. Each player has a unique index.

**Input Format**

The first line contains the number of test cases. For each following two lines, the first line stores the initial cards concatenated from all players. The second line consists of several numbers separated by a white space. The first number stands for the number of players. The second number stands for the number of cards issued to each player at this round. The remaining numbers stands for the indices of his original hand of cards.

**Output Format**

The output should consist of one line for each test case. Each line contains the concatenated pokes.

**Example**

|  |  |
| --- | --- |
| **Sample Input:** | **Sample Output:** |
| 2  39J2K7  2 3 2 5  399111111  3 3 5 7 2 | 329J7K  191311119 |