

Problem B: Barcode

This year's election, every ballot is printed with a small hexadecimal barcode near the corner. The public is told the barcode is just an anonymous serial number that helps the counting machines. Wang believes what he is told, but the deepest consciousness still has doubt.

Wang has an excellent memory. He remembers the exact barcode printed on his own ballot, and he knows all the names and orders in the sign-up sheet. Later, watching the count, he reads the barcode on other ballots as each vote is announced. Because the numbering is sequential, every barcode he sees tells him exactly how many places ahead of or behind whom it belongs to. The "anonymous" serial was never anonymous at all.

You are given the list of voters (Wang included) in the sign-up sheet, in the exact order, the barcode Wang remembers from his own ballot, and the candidate Wang himself voted for.

Then, you are then given several observed ballots, each as a barcode and the candidate number it was announced for. For every voter on the list whose vote Wang can deduce, report who they voted for.

Input:

The first line contains an integer T , the number of test cases. For each test case:

- a line with three integers N , M : the number of listed voters, and the number of observed ballots
- a line with N distinct voter names in voting order, separated by spaces; one of them is **wang**
- a line with Wang's remembered barcode (hexadecimal) and the candidate number Wang voted for
- then M lines, each with an observed barcode (hexadecimal) and a voted number.

An observed ballot may or may not belong to one of the N listed voters.

Output:

For each test case, print the number of deduced votes. Then, for every listed voter whose vote Wang can determine, print one line with the voter's name and the candidate number they voted for. Print these lines **sorted alphabetically by voter name**.

Sample Input	Sample Output
<pre> 2 3 2 win ohm wang 7B83C9D5 37 7B83C9D3 46 7B83C9D5 37 9 6 wang ham ying chai hom ekk aum ton fah 1A2BEF43 12 1A2BEF41 39 1A2BEF4A 3 1A2BEF36 7 1A3BEF44 39 1A2BEF4B 22 1A2BEF30 5 </pre>	<pre> 2 wang 37 win 46 3 fah 22 ton 3 wang 12 </pre>

Explanation:

- Test Case #1: two votes are observed. Wang remembers that **7B83C9D5** belongs to him. He also knows that **7B83C9D3** belongs to Win, who is two places before him in the sign-up sheet. (Wait, how did he know?)

Constraints:

- $1 \leq T \leq 50$
- $1 \leq N, M \leq 2,000$
- Length of the barcode is 8 hexadecimal digits
- Candidate number is between 1 to 57