Tournament

Jonathan, your friend, is celebrating his birthday. To celebrate his birthday, Jonathan is organizing a simple tournament. This tournament will only have a single winner out of many participants that take part. Jonathan wants to have a system to help him organize this tournament. Normally, he will code the program himself, but he is now busy working out to get back into shape after his vacation overseas. Exhausted, Jonathan approaches you to help him create this tournament system.

This tournament is organized with the following rules:

1. Each participant will start with 0 points and each of them will be given a number written on a card. The number will be 0 to M-1 inclusive, with M being the number of participants. No two participants receive the same number.
2. The participants will be seated in a circular, clockwise manner, starting from the one with the lowest-numbered card to the one with the highest-numbered card. The numbers will be their initial "seat number".
3. There is a number N generated by the system.
4. In each turn, each participant multiplies his/her seat number with N to get a new number X. If X is larger or equal to M (X >= M), we take the remainder (i.e. X % M). The new number will then be the new seat number (and hence, new seat) for the participant. It is guaranteed that all participants will always have a different seat at each turn.
5. After they have been seated at their new positions, the participants take the sum of the card number of the two person sitting next to them (i.e. the one on their right and left). This sum is then added to their current total points.
6. Repeat step 4 and 5 N times.
7. The participant with the highest total points wins.

Your job is to simulate this tournament using your programming skills. Be a good friend and help Jonathan organize this tournament.

Input

The first line of input consists of two numbers M and N (2 <= M, N <= 50), separated by a single space. M lines follow. Each line contains the name of each participant, as well as his or her initial seat number. All names are guaranteed to be single words and at most 15 characters long. Each name starts with an uppercase letter, followed by a sequence of lowercase letters.

Output

Print the name of the winner of the tournament as well as his or her total points in one line, separated by a single space.

Sample Input

```
5 2
Annie 3
Bonnie 1
Charles 4
Dennis 2
Ellie 0
```

Sample Output

```
Ellie 10
```

Explanation

We first denote the names using their initials (i.e. A is Annie, B is Bonnie, and so on). The table below illustrates the sample input given above.

Position	0	1	2	3	4	Explanation
Initial State	E	B	D	A	C	A's next position will be (3 x 2) % 5 = 1
Card Number	0	1	2	3	4	
Iteration 1	E	A	B	C	D	A's next position will be (1 x 2) % 5 = 2
Card Number	0	3	1	4	2	
Current Score	5	1	7	3	4	E gets 3 points from A and 2 points from D
Iteration 2	E	C	A	D	B	
Card Number	0	4	3	2	1	
Current Score	10	6	7	8	9	E gets 4 points from C and 1 point from B

The winner is E (Ellie) with 10 points.