7619 Guessing the Dice Roll

There are N players playing a guessing game. Each player guesses a sequence consists of {1,2,3,4,5,6} with length L, then a dice will be rolled again and again and the roll out sequence will be recorded. The player whose guessing sequence first matches the last L rolls of the dice wins the game.

Input

The first line is the number of test cases.

For each test case, the first line contains 2 integers N ($1 \leq N \leq 10$) and L ($1 \leq L \leq 10$). Each of the following N lines contains a guessing sequence with length L. It is guaranteed that the guessing sequences are consist of {1,2,3,4,5,6} and all the guessing sequences are distinct.

Output

For each test case, output a line containing the winning probability of each player with the precision of 6 digits.

Sample Input

```
3
5 1
1
2
3
4
5
6 2
1 1
2 1
3 1
4 1
5 1
6 1
4 3
1 2 3
2 3 4
3 4 5
4 5 6
```

Sample Output

```
0.200000 0.200000 0.200000 0.200000 0.200000
0.027778 0.194444 0.194444 0.194444 0.194444 0.194444
0.285337 0.237781 0.237781 0.239102
```