

Problem L

Majority Vote

Time limit: 1 second

The Pacific island of Baxos was a thriving mercantile center. Wealth led to political sophistication, and the Baxons replaced their tribal theocracy with a parliamentary form of government. But trade came before civic duty, and no one in Baxos was willing to devote his life to Parliament. As a result, the Baxon Parliament had to function even though legislators continually wandered in and out of the parliamentary Chamber. So, they needed to elect legislators through a unique voting system.

Suppose there're N legitimate voters on the island and there're K candidates for the Parliament. Every legitimate citizen simply ranks the candidates with a *unimodal permutation* on $[K] := \{1, 2, \dots, K\}$. A permutation $\pi = (\pi_1, \dots, \pi_K)$ is called unimodal if there is an integer $i \in \{1, \dots, K\}$ satisfying $\pi_1 > \dots > \pi_i$ and $\pi_i < \pi_{i+1} < \dots < \pi_K$. Note π_i indicates the rank of candidate i , the smaller the better. Given the N individual rankings on the candidates, the Parliament wants to determine a permutation $\tau = (\tau_1, \dots, \tau_K)$ as the preference order, such that for any pair of i and j , $1 \leq i < j \leq K$, the *majority* of the N voters prefer candidate τ_i to candidate π_j . Note the *majority* means at least half of the voters prefer candidate τ_i to candidate π_j .

Ranking	Candidate 1	Candidate 2	Candidate 3
Voter 1	1	2	3
Voter 2	3	1	2
Voter 3	3	2	1

For example, let $N = 3$, $K = 3$ and the voters give three rankings: $(1, 2, 3)$, $(3, 1, 2)$, $(3, 2, 1)$, as illustrated in the above table. Then the answer is $\tau = (2, 3, 1)$. It can be verified the majority of the voters (2 voters) favors Candidate 2 over the other candidates. Also, the majority prefers Candidate 3 to Candidate 1. Your task is to write a program to help the parliamentary Chamber find the preference order as the group decision.

Technical Specification

1. $1 < N < 1,000$
2. $1 < K < 1,000$

Input File Format

The first line of the input gives the number of test cases, T (< 10). For each test case, the first line consists of two positive integers N, K indicating the number of voters and the number of candidates, respectively. The i -th line of the following N lines contains K integers indicating the ranking given by the i -th voter.

Output Format

For each test case, output one line that contains the preference order of the candidates.

Sample Input

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

Sample Output for the Sample Input

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