

F - Voting

Input File: VotingIn.txt

When Australians vote in their general elections, they must rank all of the candidates in order of preference. To determine the winner of the election, initially only the first choices are counted. If one candidate received more than 50% of the vote the candidate is elected. If no candidate receives more than 50% of the first place votes, the candidates receiving the lowest number of first place votes are eliminated. Ballots that rank these candidates first are then recounted in favor of their next highest-ranked non-eliminated candidate. This process of eliminating the lowest first place vote-getters and recounting their ballots in favor of their highest-ranked non-eliminated candidate continues until one candidate receives more than 50% of the vote, or until all remaining candidates are tied.

Inputs

The first line will contain the number of elections to consider. This will be followed by one data set per election. The first line of each data set contains the number of candidates in the election, N , followed by the number of votes cast, C . The next N lines contain the names of the candidates, one per line, with the name of candidate 1 on the first line, the name of candidate 2 is on the second line, etc. The next C lines contain the ballots, one per line, each containing the integers between 1 and N in some order. The first integer is the number of the candidate that is a voter's first choice; the second integer is the number of the candidate that is a voter's second choice; etc.

Outputs

There will be one line of output for each election. The line will either contain the name of the candidate who won the election, or the names of the candidates who tied, in candidate number order separated by a space.

Sample inputs and outputs

(See next page)

Sample Inputs

3

3 5

Joe Down Under

Mary Poppins

Babe Ruth

1 2 3

2 1 3

2 3 1

1 2 3

3 1 2

4 6

Joe Down Under

Mary Poppins

Alexander the Great

Babe Ruth

1 2 3 4

4 1 3 4

3 1 2 4

2 3 4 1

1 2 4 3

3 4 1 2

5 7

Joe Down Under

Mary Poppins

Babe Ruth

Alexander the Great

Billy Boy

4 2 3 1 5

2 4 3 1 5

2 3 1 5 4

4 2 3 1 5

3 5 4 1 2

1 3 2 4 5

1 3 2 4 5

Sample output

Joe Down Under

Joe Down Under Alexander the Great

Alexander the Great