

Australian Voting

Source: <http://acm.tju.edu.cn/toj/showp1299.html>

Australian ballots require that the voter rank the candidates in order of choice. Initially only the first choices are counted and if one candidate receives more than 50% of the vote, that candidate is elected. If no candidate receives more than 50%, all candidates tied for the lowest number of votes are eliminated. Ballots ranking these candidates first are recounted in favour of their highest ranked candidate who has not been eliminated. This process continues [that is, the lowest candidate is eliminated and each ballot is counted in favour of its ranked non-eliminated candidate] until one candidate receives more than 50% of the vote or until all candidates are tied.

Input

The first line of input is the number of test cases. Each test case then starts with two integer N and V , $N \leq 20$ indicating the number of candidates and $V \leq 1000$ the number of voters. The next n lines consist of the names of the candidates in order. Names may be up to 80 characters in length and may contain any printable characters. V lines follow; each contains the contents of a ballot. That is, each contains the numbers from 1 to n in some order. The first number indicates the candidate of first choice; the second number indicates candidate of second choice, and so on.

Output

The Output consists of either a single line containing the name of the winner or several lines containing the names of the candidates who tied.

Sample Input

```
1
3 5
John Doe
Jane Smith
Sirhan Sirhan
1 2 3
2 1 3
2 3 1
1 2 3
3 1 2
```

Sample Output

```
John Doe
```