
Soccer table

P86236_en

You are a sports journalist that is in charge of the soccer matches in your newspaper. The editor has asked you for printing all the results of the played matches to date. However, your lack of organization is about to play a dirty trick on you: you do not find the file where you have stored all the results! You only know the number of points that every team has won (0 for a lost, 1 for a tie, and 3 for a won match), and the played matches to date. Write a program that indicates the result of each one of the played games.

Input

For each case consists of two natural numbers, $M \leq 10$ and $N \leq 20$, representing the number of teams in the league and the number of played matches, respectively. Then, M lines come with the names of the teams and the number of points that they have. Finally, N lines come, each one of them contains the number of two of the previous team, indicating that the two team have played a match between them. The input may contain various cases, separated by a line in white. A line with the number -1 indicates the end of the input.

Output

For each test data of the input, your program must print the result of all the matches in a line, separated by spaces. If the local team has won, it must print “1”: if the visiting team has won, print “2”; if there was a tie, print “X”. We assure you that each case only admits a solution.

Scoring

- **Test1:**

45 Points

Tests with no more than 20 cases with $M \leq 6$ y $N \leq 10$, as the ones in the instance 1.

- **Test2:**

55 Points

Tests with no more than 20 cases with $M \leq 10$ y $N \leq 20$, as the ones in the instance 2.

Sample input 1

```
2 1
Barcelona 1
Madrid 1
Barcelona Madrid

2 1
Barcelona 3
Madrid 0
Madrid Barcelona

2 1
Madrid 3
Barcelona 0
Madrid Barcelona
```

```
4 4
Barcelona 4
Madrid 4
Sevilla 2
Getafe 0
Barcelona Getafe
Madrid Sevilla
Sevilla Barcelona
Getafe Madrid

6 9
Barcelona 6
Valencia 4
Madrid 4
Deportivo 4
Sevilla 3
```

```
Betis 3
Barcelona Deportivo
Valencia Deportivo
Valencia Barcelona
Betis Sevilla
Madrid Deportivo
Sevilla Madrid
Betis Deportivo
Madrid Betis
Betis Valencia
```

```
6 10
Madrid 8
Barcelona 8
Valencia 4
Sevilla 4
Deportivo 2
Betis 0
Madrid Deportivo
Barcelona Sevilla
Betis Madrid
Betis Sevilla
Barcelona Deportivo
Betis Barcelona
Madrid Barcelona
Sevilla Deportivo
Deportivo Valencia
Madrid Valencia
```

```
-1
```

Sample input 2

```
10 18
Deportivo 11
Betis 9
Sevilla 6
AtlMadrid 6
Barcelona 5
AthBilbao 4
Madrid 2
Espanyol 2
Valencia 1
RealSociedad 1
Deportivo RealSociedad
Barcelona AtlMadrid
AthBilbao Espanyol
AtlMadrid Madrid
Deportivo Madrid
Betis Deportivo
RealSociedad Espanyol
Valencia Deportivo
Deportivo Barcelona
Madrid Barcelona
Espanyol Sevilla
Sevilla AtlMadrid
Madrid Betis
Valencia AthBilbao
Betis AthBilbao
Valencia AtlMadrid
RealSociedad Betis
```

Sample output 1

```
X
2
1
1 X X 2
1 1 2 2 2 X X X
1 1 2 2 X 2 X X 2 X
```

```
Barcelona Betis
```

```
-1
```

Sample output 2

```
1 1 X 1 1 X X X 1 X 2 1 X 2 1 2 2 X
```

Problem information

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