

The Social Network

Time Limit: 2000 MS Memory Limit: 64M

[Description]

The social network system (SNS) helps people to keep connecting with their friends. Every user in SNS has a friends list. The user can read news posted by the users in his friends list. Friend relation is symmetric - if A is a friend of B, B is always a friend of A.

Another important function in SNS is friend recommendation. One effective way to recommend friends is recommend by mutual friends. A mutual friend between two users A and B, is a user who is a friend of both A and B. A user can not be a friend of himself. For a specific user A, the system will recommend the user who is not himself or his friend, and has mutual friends with A. If more than one such user exists, recommend the one has most mutual friends with A. If still a tie exists, output all of them.

[Input]

The first line is a integer T ($T \leq 100$), the number of test case.

The beginning of each test case is two integers N and Q, the number of friend relationship and the number of query. $1 \leq N, Q \leq 1000$

The following N lines each contain two different names separated by a single space. Each name consisted by only lowercase letters, and its length is less than or equal to 15. This means the two users are friends. No friend relationship will be given more than once.

The following Q lines each describe a query. Each line contain one user name. The data guarantee that this name appears at least once in above N lines.

[Output]

For each case, you should output one line containing "Case k: " first, where k indicates the case number and counts from one. Then for each query, output one line, contains one or more names of recommended friends, separate by a single space, sorted by alphabetical order. If no persons can be recommended, output one line contains "-".

[Sample Input]

```
1
10 11
hongshu digua
yingying hongshu
xmm hongshu
huaxianzi xmm
tangjiejie huaxianzi
xhmz yingying
digua xhmz
zt tangjiejie
xmm lcy
```

notonlysuccess lj
hongshu
digua
yingying
xmm
huaxianzi
tangjiejie
xhmz
zt
lcy
notonlysuccess
lj

[Sample output]

Case 1:

xhmz
yingying
digua
digua tangjiejie yingying
hongshu lcy zt
xmm
hongshu
huaxianzi
hongshu huaxianzi
-
-