

MultiSort

Members of the famous ENSI Competitive Programming Club try to gather a huge database of problem sets. They need to sort all the problems according to their difficulty levels. Each of the M club members takes N problems and brings back the sorted list. The score (difficulty level) is a real value evaluated as a combination of many criterions. Write a program that outputs the global sorted list of $N \cdot M$ problems.

Input

First line of input consists of an integer T denoting the number of test cases. Then T test cases follow. Each case begins with two lines containing two integers M and N ($N \cdot M \leq 10^6$). Each of the M next lines contains N space separated real numbers (scores) in descending order. All the scores are guaranteed to be in $[0, 10]$.

Output

A single line for each test case consisting of $N \cdot M$ space separated problems. Each problem is represented by i,j where i is the input member position (from 1 to M) and j is the position in the original list (from 1 to N). Problems are sorted by score (descending order) then by member's position (ascending order) and finally by problem's position in the original member's list (ascending order).

Input File is large. Use fast I/O methods.

Example

Input:

```
1
3
4
9.195 4.17 2.532 0.03
8.28 5.5 4 2.69
8.8320 7.9 2.18 0
```

Output:

```
1,1 3,1 2,1 3,2 2,2 1,2 2,3 2,4 1,3 3,3 1,4 3,4
```