Problem E. Ernesto

Source file name:	Ernesto.c, Ernesto.cpp, Ernesto.java, Ernesto.py
Input:	`Standard`
Output:	`Standard`
Time / Memory limit:	`2/3/3 (C++/Java/Python) second(s) / 256 megabytes`
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Ernesto is a businessman with a large number of ideas to become a millionaire. The problem is that he doesn't have time to develop them (because he is always busy), so he needs to find students to develop them for him. However, Ernesto has a couple of restrictions:

1. The students must work for him for free, as he is very stingy and doesn't like to pay.
2. He only has time to "exploit" one student at a time.

Balloons in programming contest, *Semillero In Silico, UTP*

Naturally, the offer doesn't seem very appealing to students, so what Ernesto does is hire them without telling them how much they will be paid. This way, they only realize they are working for free when they try to claim their first paycheck.

Since many students are friends with each other, if Ernesto hires a student, this student—after not receiving any payment—will warn all their friends not to work for Ernesto. The friends of this student, in turn, will warn all their other friends, who will warn all their friends that have not yet encountered Ernesto, and so on. Eventually, the entire group of friends and friends-of-friends of the exploited student will be warned. Obviously, there will come a time when all the students will be warned, and Ernesto will not be able to continue hiring.

Since each student has a tolerance to exploitation H (which determines the number of hours they would work without asking for payment), Ernesto has assigned you the task of telling him which students he should hire in order to maximize the number of hours students will work for him. You're in luck: this time the stingy Ernesto has promised you a balloon if you advise him correctly.

Input

The input begins with a positive integer T ($1 \leq T \leq 10$), which represents the total number of test cases. The first line of each test case contains two integers N and M $\left(1 \leq N \leq 10^5,\ 0 \leq M \leq 10^6\right)$, which respectively represent the number of students and the number of friendship relations. The following N lines each contain a string and a positive integer, $S\ H$ $\left(1 \leq |S| \leq 10,\ 1 \leq H \leq 10^8\right)$, which respectively represent the name of the student and their number of hours of tolerance to exploitation. The student name contains only lowercase letters from the English alphabet. It is guaranteed that there are no two students with the same name, and also no two students with the same number of tolerance hours.

The test case continues with M lines, each containing a pair of strings $A\ B$ (equivalent to $B\ A$, with $A \neq B,\ \ 1 \leq |A|, |B| \leq 10$) indicating that students with names A and B are friends. Each friendship relation will appear at most once per test case.

Note 1: The sum of all N values across all T test cases is at most 10^5.

Note 2: The sum of all M values across all T test cases is at most 10^6.

Output

For each test case, print one line with "`Case idCase:`" — the quotes are for clarity only — where `idCase`

is replaced by the test case number, followed by as many lines as necessary with the names of the students in alphabetical order. These are all the students Ernesto should hire in order to maximize the number of hours students will work for free for him in that test case. For clarity, refer to the sample input and output below.

Example

Input	Output
2 7 4 arturo 100 daniel 15 carlos 50 carolina 20 jorge 1000 jessica 16 susana 1 daniel arturo carlos carolina carolina jessica susana jessica 5 4 sara 10 marcela 20 dario 25 adrian 26 laura 15 marcela sara dario marcela laura dario adrian laura	Case 1: arturo carlos jorge Case 2: adrian

Use fast I/O methods