

Coding Area

 tcscodevita.com/main_page.jsp

College Rank I



Problem Description

College Admissions are done by allocating a seat to a student based on his/her preference and percentage scored. Students are asked to provide three colleges of their choice. Each college will have a quota of S seats (S can vary per college). Admissions will be processed based on 'percentage scored' and availability of seats as per 'choice of preference'.

Admissions will first be granted based on percentage scored. If there is a tie, on percentage scored, then admission will be granted based on student Id i.e. student with a lower Id will be given preference over student with higher Id.

All admissions will be processed based on students' choice i.e. if a student is eligible to get admitted in any of the 3 colleges, s/he will have to be admitted. Similarly, it will be binding on the student to get admitted. Obviously, first choice will get first preference, second choice will get second preference and so on.

Find the list of students who got admitted in any college of their choice.



Constraints

$$3 \leq C \leq 25$$

$$1 \leq N \leq 10000$$

$$1 \leq S_i \leq 120$$



Input

First line contains two integers viz. C and N where,

C is number of colleges and

N is number of students

Second line contains C spaced integers denoting S_1, S_2 and so on till S_C - where S_1 is number of seats in college 1, S_2 in college 2 etc.

Next, N lines comprise of 5 data items, viz <student-id, percentage, Choice 1, Choice 2, Choice 3>

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Output

Display the students who got admitted in any college of their choice in descending order of their percentages. If there is a tie, on percentage scored, then print lower student Id ahead of higher student Id.

The output format is <student-id college>

For better understanding go through the *Examples* given below.

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Time Limit (secs)

1

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Examples

Input

3 5

3 1 2

Student-1,97.05,C-1,C-3,C-2

Student-2,48.03,C-1,C-2,C-3

Student-3,85.69,C-1,C-3,C-2

Student-4,80.83,C-1,C-3,C-2

Student-5,41.23,C-1,C-2,C-3

Output

Student-1 C-1

Student-3 C-1

Student-4 C-1

Student-2 C-2

Student-5 C-3

Explanation

Here student-1 with highest percentage gets his first preferred college, then the next top scorer, Student-3 gets his first preferred college and so on.

However, we can see that there are only three seats in college 1 so only students with good percentage get admitted (i.e., student-1, student-3, student-4).

Now college 1 allocation quota is complete. Hence no new student can be admitted to college 1. college 2 and college 3 still have one and two seats respectively. Now, Student-2 and Student-5 are yet to be admitted.

Both student's priority is college 2 as second choice, but Student-2 is admitted to college 2 due to higher percentage (i.e., Student-2 Percentage > Student-5 Percentage).

Now there are only 0,0,2 seats left in college 1, college 2 and college 3 respectively. So, Student-3 is admitted to college 3.

Example 2

Input

4 5

2 1 1 1

Student-1,97.05,C-1,C-3,C-2

Student-2,48.03,C-1,C-2,C-3

Student-3,85.69,C-1,C-3,C-2

Student-4,80.83,C-1,C-3,C-2

Student-5,41.23,C-1,C-2,C-3

Output

Student-1 C-1

Student-3 C-1

Student-4 C-3

Student-2 C-2

Explanation

Here allocation is done based on percentage and preference, that is student with high percentage is admitted based on his choice of preference. So, Student-1, Student-2, Student-3, Student-4 is admitted based on their score and choice. However, Student-5 is left unadmitted because all the choice of his/her colleges is full. So, Student-5 is not displayed in output.