# Star

2024/2025 SEASON – FIRST ROUND

While wandering through the Director's house, Aqua found the script for his latest film, "My Star." As a punishment, the Director made him help organize the shooting.

The film features N actors, numbered from 1 to N, and they need to shoot M scenes, numbered from 1 to M. Each scene involves specific actors, and in scene i, there are $br_i$ actors participating. The entire film will be shot over M hours, with each scene taking exactly 1 hour. The earliest scene will be shot from hour 0 to hour 1, the next will begin immediately at hour 1 and continue until hour 2, and so on. The last scene will be filmed from hour M-1 to hour M. Aqua knows that each actor arrives exactly at the hour when their first scene begins and stays on set until their last scene is filmed. The boy has a list $c_1, c_2, ..., c_N$, where $c_j$ is the amount to be paid to actor j for each hour they are on set. The Director is stingy, and Aqua noticed that if one actor performs more scenes than another, then the salary of the former (the one with more scenes) must necessarily be lower.

Aqua's task is to find an order in which the scenes will be filmed so that the total amount the Director has to pay the actors is minimized. However, Aqua is too busy searching for his father and asks you to solve the problem for him. Given N, M, a list of scenes and the actors in them, and a list of salaries, find an optimal order for filming the scenes.

**Input**

From the first line of the file **star.in** N and M are read—representing the number of actors and the number of scenes. The second line contains N numbers $c_1, c_2, ..., c_N$, which are the hourly wages of the actors. Each of the following M lines follows this format: line i+2 starts with a number $br_i$, the number of actors participating in scene i, followed by $br_i$ numbers: $a_1, ..., a_{bri}$, describing which actors are in the scene.

**Output**

On the only line of the file **star.out** print M numbers: the order in which the scenes should be filmed.

**Scoring**

If 1) not every scene appears in the output, 2) any scene appears more than once in the output, or 3) the output contains a number less than 1 or greater than M, you will receive the message "Error" and 0 points for that test. Otherwise:

Let yourScore be the sum of the money that needs to be paid to each actor if the scenes are filmed in the printed order:

Let begj be the position in the order of the first scene of actor j, and endj be the position in the order of the last scene of actor j, so $yourScore = \sum_{j=1}^{N}(end_j - beg_j + 1) * c_j$

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, and minScore is the smallest sum among the results of all participants. You will receive $1 - \sqrt{1 - (\frac{minScore}{yourScore})^{1.3}}$ multiplied by the points allocated for this test.

**Constraints**

$1 \leq N \leq 10000$

$1 \leq M \leq 5000$

$5 * 10^5 \leq c_j \leq 10^6$

$Let\ S = \sum_{i=1}^{M} br_i\ , then\ 1 \leq S \leq 40 * M$

**Time Limit: 5 sec.**

**Memory Limit: 256 MB.**

**Test Spread:**

The tests are evenly distributed into 20 groups as follows:

| Constraints | M=50 | M=100 | M=500 | M=1000 | M=5000 |
|---|---|---|---|---|---|
| N=M/5 | S=200 | S=1000 | S=5000 | S=10000 | S=50000 |
| N=M/2 | S=1000 | S=2000 | S=10000 | S=20000 | S=100000 |
| N=min(2*M, 5000) | S=2000 | S=4000 | S=20000 | S=40000 | S=200000 |
| N=min(5*M, 10000) | S=2000 | S=4000 | S=20000 | S=40000 | S=200000 |

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**Sample tests**

| Input (star.in) | Output (star.out) |
|---|---|
| 5 6<br>8 6 7 4 6<br>3 2 4 5<br>2 4 5<br>4 1 2 3 5<br>2 3 4<br>3 1 2 3<br>1 4 | 5 3 1 4 6 2 |

**Explanation for the sample test**

For the printed shooting order 5 3 1 4 6 2:
Actor 1 arrives on set at hour 0 (for scene 5) and leaves at hour 2 (after scene 3), earning 2*8=16.
Actor 2 arrives on set at hour 0 (for scene 5) and leaves at hour 3 (after scene 1), earning 3*6=18.
Actor 3 arrives on set at hour 0 (for scene 5) and leaves at hour 4 (after scene 4), earning 4*7=28.
Actor 4 arrives on set at hour 2 (for scene 1) and leaves at hour 6 (after scene 2), earning 4*4=16.
Actor 5 arrives on set at hour 1 (for scene 3) and leaves at hour 6 (after scene 2), earning 5*6=30.
The total amount to be paid is 108.