Exercise grades

Mr. Huy ask his students to submit their exercise to a grading system. Students can submit unlimited times until the deadline for each problem. However, for each problem, student will receive the highest score among all submissions. Note that, each exercise has a different weight.

Given students submissions and the list of courses, help Huy calculate grades for each student.

Input

-        The first line contains three integers **N**, **P**, **M**, which are the number of students, the number of problems and the number of submissions ($N \leq 10^5$, $P \leq 100$, $M \leq 2*10^5$).

-        The second line contains **N** integers representing the student ids

-        In the next **P** lines, each line consists of 2 numbers: **Pi** and **Wi** which are the exercise code and its weight.

-        In the next **M** lines, each line consists of 3 numbers: **Ni**, **Pi** and **Si**, which are student id, exercise code, and scores which show the results of each submission.

All numbers are in signed 32-bit integer ranges

Output

Consists of **N** lines, each containing a student ID and the average grade.

The results should be in order of increasing student ids and the average grade is rounded down to the unit.

Sample

Input	Output
2 2 3	1 86
1 2	2 66
11 2	
12 4	
1 11 80	
1 12 90	
2 12 100	