

Problem D. Determine The Fluctuation Bonus

Input file: *standard input*
Output file: *standard output*
Time limit: 2 seconds
Memory limit: 1024 mebibytes

In this unstable world, people who are not afraid of instability will win. Thus it's natural to have a contest that values Most Fluctuated Player (MFP), a player whose rank is most fluctuated during the contest.

International Change Promotion Contest (ICPC) is one of such contests. In this contest, N participants challenge Q quizzes. This contest uses two types of tokens: points and coins. Points are for evaluation of quiz ability itself, but coins are for evaluation of fluctuation. So coins are more important because it directly affects final results.

Each participant initially has 0 points and 0 coins. A participant that answers the i -th quiz gets p_i points. Note that p_i can be negative; it's fine because the focus of the contest is instability (coins), not points. Point ranking is calculated every time after each quiz finishes, and each participant gets coins based on fluctuation of their point rank: if a participant's point rank is changed from a to b the participant gets $|a - b|$ coins, where $|x|$ means the absolute value of x . The point rank of a participant is defined as 1 plus the number of participants who have points (properly) greater than the point of the participant. For example, initially, all the participants have rank 1 since all the participants have 0 points and thus none has points greater than others.

You, as an organizer of ICPC, have a record of a past contest. The record contains information about Q quizzes: the i -th quiz was answered by participant a_i and the point is p_i . But the record doesn't contain the final results: the coins each participant earned in the end. Your task is to write a program to compute the numbers of coins of all the participants after Q quizzes from the record.

Input

The first line contains two numbers N and Q , where N is the number of participants ($1 \leq N \leq 10^5$) and Q is the number of quizzes ($1 \leq Q \leq 10^5$). The i -th of the following Q lines consists of two integers a_i and p_i , which represent that the i -th quiz was answered by participant a_i ($1 \leq a_i \leq N$) and the points of the i -th quiz is p_i ($-10^9 \leq p_i \leq 10^9$).

Output

Print N lines, the j -th of which is the number of coins the j -th participant earned after all the Q quizzes finish.

Examples

standard input	standard output
3 7 2 -1 1 4 2 5 3 6 1 -7 3 -6 2 9	2 6 5
9 5 2 10 2 -20 2 20 2 -20 2 20	5 32 5 5 5 5 5 5 5
5 10 1 0 3 0 2 0 5 0 4 0 1 0 3 0 2 0 5 0 4 0	0 0 0 0 0 0 0 0 0 0 0