Problem F

Power Absorption

Time limit: 1 second
Memory limit: 256 megabytes

You are playing a very popular Marvel video game called *Dr. Strange*. In this game, you take on the role of a superhero who is saving the world by absorbing the powers of monsters.

You are given a list of n monsters. The i-th monster appears at time L_i and remains present through time R_i, inclusive. It has a power level P_i. Multiple monsters may be present at the same time.

To fight against the monsters, you will perform m power absorption moves in sequence. Before the first move, you start with an initial absorbed power value of $\text{Power}_0 = 1$ (absorb from yourself).

For each move $j = 1, 2, \ldots, m$, your available energy E_j at that moment is calculated as:

$$E_j = 1 + (D_j \cdot \text{Power}_{j-1} + A_j) \bmod F_j$$

Where D_j is the durability coefficient, A_j is the agility coefficient, F_j is the fatigue level at move j, $\texttt{Power}_{j-1}$ is the total power of the monsters absorbed in the **previous** move $j-1$.

Because you are Dr. Strange, you can travel through time. At time t_j of the j-th move, with this energy E_j, you absorb the powers of the E_j weakest monsters (those with the smallest power values) currently present. If there are fewer than E_j monsters at that time, you absorb all of them. Absorbing their powers only affects your energy - it **does not weaken or eliminate** any monsters.

Let Power_j denote the total power absorbed during the j-th move. Your task is to determine $\text{Power}_1, \text{Power}_2, \ldots, \text{Power}_m$.

Input

- The first line contains an integer n, m - the number of monsters and the number of absorption moves. ($1 \le n, m \le 10^5$)
- The next n lines each contain three integers L_i, R_i, and P_i - the appearance time, disappearance time, and power of the i-th monster. ($1 \le L_i \le R_i \le 10^5, 1 \le P_i \le 10^7$)
- The next m lines each contain four integers t_j, D_j, A_j, and F_j - the time of the j-th move, and the coefficients used to compute the energy for this move. Note that all t_j form a permutation of numbers from 1 to m. ($1 \le t_j \le m, 0 \le D_j, A_j \le 10^5, 1 \le F_j \le 10^5$)

Output

Print m lines. Each line should contain a single integer - the total power absorbed in the j-th move.

Sample Input	Sample Output
3 3 1 2 10 2 3 20 1 3 5 1 2 2 2 3 3 1 3 2 1 1 5	5 25 15

Explanation

- In the first move at time $t_1 = 1$, two monsters are present. You have $\text{Power}_0 = 1$, so your energy will be: $E_1 = 1 + (2 \times 1 + 2) \bmod 2 = 1$. The monster having power 5 is absorbed.
- Second move: $E_2 = 1 + (3 \times 5 + 1) \bmod 3 = 2$. So the total power absorbed is 25.
- Third move: $E_3 = 1 + (1 \times 25 + 1) \bmod 5 = 2$. Two monsters with powers 5 and 10 are absorbed, so the total power is 15.