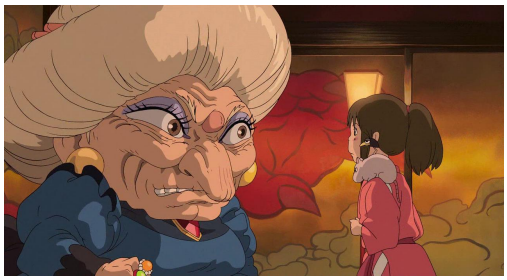
Mid Card
Problem ID: midcard


Sen and Yubaba

The witch Yubaba has forced Sen to play a card game to when back her and her parents' freedom. Cards range from 1 to C. Sen has an infinite number of cards for each possible value. In this game, there are N rounds. Within each round i, Sen can win by playing a card between range L_i and H_i (inclusive).

Please help Sen resolve T operations:

Operation type 0 is a query of the form $0\ A\ B\ K$. In this operation, Sen enters the card game starting from round A and exits the card game after round B. Yubaba has allowed Sen to choose exactly K ($1 \leq K \leq \min(100, R - L + 1)$) rounds $(R_1, R_2, \ldots, R_K)$ in this range where $(A \leq R_1 < R_2 \ldots < R_K \leq B)$. She then plays exactly K cards $(C_1, C_2, \ldots, C_K)$ where $(1 \leq C_i \leq C)$ such that C_i is played during round R_i. Note that card values can be repeated between rounds because she has infinitely many cards of each value. To answer the query, output how many distinct tuples $(R_1, R_2, \ldots, R_K, C_1, C_2, \ldots, C_K)$ exist so that Sen wins every round that she enters. Given that this number can be large, please answer modulo $10^9 + 7$.

Operation type 1 is an update of the form $1\ P\ S\ T$. In this operation, Yubaba changes the rules of the card game. Now, for round P, Sen has to play a card between S and T to win. This update applies for all future operations.

Input

The first line of input contain three space-separated integers N ($1 \leq N \leq 100\,000$), C ($1 \leq C \leq 10\,000$), and T ($1 \leq T \leq 5\,000$), which represent the number of rounds, the max possible value of a card, and the number of operations respectively.

The next N lines of input contain a list of two space-separated integers that correspond to the L_i and H_i ($1 \leq L_i \leq H_i \leq C$) of round i at the start of the game. L_i and H_i correspond respectively to the lowest and highest cards that Sen can play to win round i originally before any updates.

The next T lines of input contain operations. Each line will begin with a 0 or a 1.

- If a line starts with a 0, it will contain three additional space-separated integers A, B ($1 \leq A \leq B \leq N$), and K ($1 \leq K \leq \min(100, B - A + 1)$). A and B corresponds to the first round and last rounds Sen can play in for that query, while K corresponds to the number of rounds she plays in for that query
- If a line starts with a 1, it will contain three additional space separated integers P ($1 \leq P \leq N$), S, and T ($1 \leq S \leq T \leq C$). P corresponds to the round being updated and S and T correspond to the new lowest and highest cards Sen must play to win round P.

Output

For each query of type 0, please output the number of distinct tuples $(R_1, R_2, \ldots, R_K, C_1, C_2, \ldots, C_K)$ that follow the restrictions listed in the query, modulo $10^9 + 7$

Sample Explanation

In the sample case, for the first query, she has five ways to win by playing only in round 1, seven ways to win by playing only in round 2, four ways to win by playing only in round 3, and four ways to win by playing only in round 4. Thus, the answer to the first query is 20. For the second query, she must choose to play in rounds two and three. To win both these rounds, there are $7 \cdot 4 = 28$ possible tuples of rounds and winning cards for the second query.

Sample Input 1	Sample Output 1
4 9 6 1 5 2 8 6 9 1 4 0 1 4 1 0 2 3 2 1 2 4 4 1 1 2 6 0 1 4 1 0 2 3 2	20 28 14 4