



Problem J

Max Mod

Time limit: 1.5 seconds

Memory limit: 1 GB

Problem Description

You have an array A of N integers. Initially, all $A_i = 0$. You are also given a **prime** M .

Handle updates and queries of the following format:

1. Given X, Y : add $X + (i - 1) \cdot Y$ to A_i for all $1 \leq i \leq N$.
2. Given L, R : find the maximum value of $(A_i \bmod M)$ across all $L \leq i \leq R$.

Input Format

- The first line of each test case contains 3 integers - N, M and Q .
- The next Q lines each contain 3 integers in one of the 2 following formats:
 - $T = 1, X, Y$: representing an update with parameters X and Y .
 - $T = 2, L, R$: representing a query with parameters L and R .

Output Format

For each test case, output on a new line the maximum value of $A_i \bmod M$ for $L \leq i \leq R$ for each query.

Constraints

- $1 \leq N, Q \leq 5 \cdot 10^5$
- $1 \leq M \leq 10^9$
- M is prime
- $1 \leq T \leq 2$
- $1 \leq X, Y \leq 10^9$
- $1 \leq L \leq R \leq N$



Samples

Sample Input 1

```
5 37 6
1 2 7
1 9 13
2 2 4
1 29 3
2 1 3
2 3 5
```

Sample Output 1

```
34
26
35
```

Sample Explanation

Test Case 1: The array changes in the first 3 steps as follows:

- **Update 1:** The array is updated to [2, 9, 16, 23, 30].
 - **Update 2:** The array is updated to [11, 31, 51, 71, 91].
 - **Query 1:** $A_2 \pmod{37} = 14$, $A_3 \pmod{37} = 34$, $A_4 \pmod{37} = 17$. Thus, the maximum is 34.
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