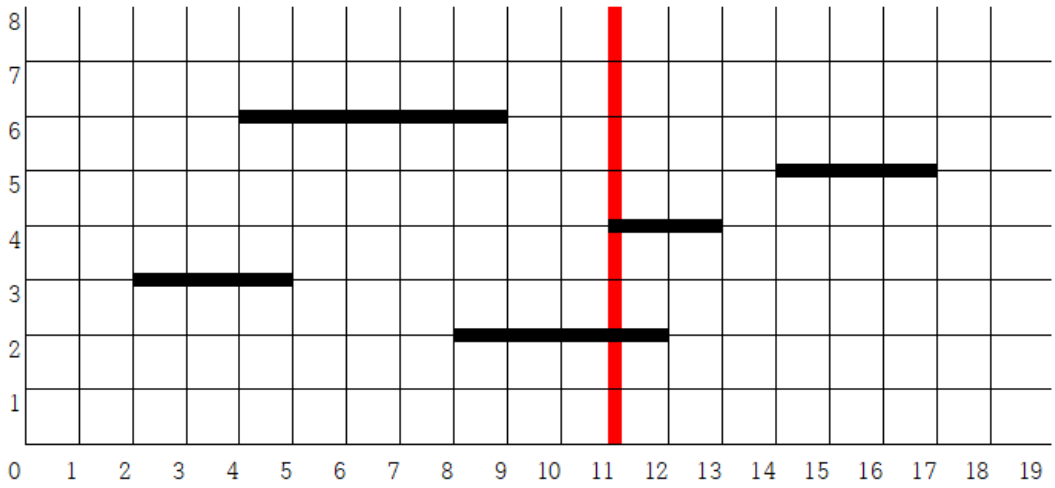
Problem L
Segments
Time Limit: 5 Seconds

In the first quadrant of a coordinate plane, you are given n line segments parallel to the x-axis. Each segment S_i $(1 \le i \le n)$ is represented by the coordinates of its left and right endpoints, (l_i, y_i) and (r_i, y_i), respectively. All coordinates are positive integers.

You must now answer q queries. For each query, a vertical line $x = p$, parallel to the y-axis, is given. The vertical line is represented by a single positive integer p.

If each segment S_i is horizontally extended, it will eventually meet the line $x = p$ at the point (p, y_i). If the segment, including its endpoints, already meets $x = p$, no extension is needed. For example, suppose there are 5 segments $\{(2,3),(5,3)\}$, $\{(4,6),(9,6)\}$, $\{(8,2),(12,2)\}$, $\{(11,4),(13,4)\}$, and $\{(14,5),(17,5)\}$, and a single line $x = 11$. The first segment must be extended by 6 to the right, the second segment 2 to the right, the third and the fourth segments 0, and the fifth segment 3 to the left for each to meet $x = 11$.

For each query, determine the maximum among the extension lengths required for all segments to meet the line $x = p$. Formally, let $\text{dist}(p, S_i)$ denote the distance that segment S_i must be extended to intersect $x = p$ at (p, y_i). For each query, output $\max_{1 \le i \le n} \text{dist}(p, S_i)$. In the example above, the answer to the query is 6. See the figure below.



Given n segments and q queries, write a program to output the maximum extension length for each query.

Input

Your program is to read from standard input. The input starts with a line containing two integers n $(1 \le n \le 2 \times 10^6)$ and q $(1 \le q \le 2 \times 10^6)$, where n is the number of line segments and q is the number of queries. In the following n lines, the i-th line contains three integers, l_i, r_i, and y_i $(1 \le l_i \le r_i \le 10^9;\ 1 \le y_i \le 10^3)$, where l_i (resp. r_i) is the x-coordinate of left (resp. right) endpoint of S_i and y_i is the y-coordinate of both endpoints of S_i. In the following q lines of queries, the j-th line contains one integer p_j $\left(1 \le p_j \le 10^9\right)$ which denotes the vertical line $x = p_j$.

Output

Your program is to write to standard output. Print exactly one line per each query. The j-th line should contain the maximum among the extension lengths required for all segments to meet $x = p_j$ at $\left(p_j, y_j\right)$.

The following shows sample input and output for two test cases.

Sample Input 1

```
5 3
2 5 3
4 9 6
8 12 2
11 13 4
14 17 5
11
5
1
```

Output for the Sample Input 1

```
6
9
13
```

Sample Input 2

```
4 8
1 4 7
3 7 5
10 13 8
12 15 2
13
7
4
8
3
11
1
16
```

Output for the Sample Input 2

```
9
5
8
4
9
7
11
12
```