

Multiply Then Plus

Input file: **standard input**
Output file: **standard output**
Time limit: 6 seconds
Memory limit: 1024 megabytes

Given n pairs $(a_1, b_1), (a_2, b_2), \dots, (a_n, b_n)$, you need to perform q operations. Each operation has one of the following forms:

- “1 k a b ” ($1 \leq k \leq n, 1 \leq a, b \leq 10^9$): Modify the k -th pair into (a, b) .
- “2 x l r ” ($1 \leq x \leq 10^9, 1 \leq l \leq r \leq n$): Find the maximum value of $a_i \times x + b_i$, where $l \leq i \leq r$.

Input

The first line contains two integers n and q ($1 \leq n, q \leq 500\,000$) denoting the number of pairs and the number of operations.

Each of the following n lines contains two integers a_i and b_i ($1 \leq a_i, b_i \leq 10^9$), denoting the i -th pair.

Each of the next q lines describes an operation in the format shown above.

Output

For each query, print a single line containing an integer denoting the answer.

Example

standard input	standard output
3 5	6
2 3	9
1 5	4
3 1	7
2 1 1 3	
2 3 1 2	
1 3 1 1	
2 3 3 3	
2 2 1 3	