Problem C. Multiply Then Plus

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

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

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

Input

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

Each of the following n lines contains two integers a_i and b_i ($1 \le a_i, b_i \le 10^9$), 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 2 3 1 5 3 1 2 1 1 3 2 3 1 2 1 3 1 1 2 3 3 3 2 2 1 3	6 9 4 7