Problem B. Collinear Arrangements

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	512 mebibytes

Given a convex polygon of n points $P_1, P_2, \ldots, P_n$ on a two-dimensional plane, answer q queries, where each query has one of the following types:

1. Given one point (x, y), find the number of pairs (P_i, P_j) such that $1 \le i < j \le n$ and the three points (x, y), P_i, and P_j are collinear.
2. Given two points (x_1, y_1) and (x_2, y_2), find the number of points P_i such that $1 \le i \le n$ and the three points (x_1, y_1), (x_2, y_2), and P_i are collinear.

Input

The first line contains two integers n and q ($3 \le n \le 10^5$, $1 \le q \le 10^5$) denoting the number of vertices in the given polygon and the number of queries, respectively.

Each of the following n lines contains two integers, x and y, denoting a vertex of the polygon.

Each of the following q lines contains one query, which is in one of the following formats:

1. "`1` x y", asking to calculate the number of pairs (P_i, P_j) such that $1 \le i < j \le n$ and the three points (x, y), P_i, and P_j are collinear.
2. "`2` x_1 y_1 x_2 y_2", asking to calculate the number of points P_i such that $1 \le i \le n$ and the three points (x_1, y_1), (x_2, y_2), and P_i are collinear.

It is guaranteed that:

- $|x|, |y| \le 10^9$ for all points and queries;
- the polygon vertices are given in counter-clockwise order;
- the polygon is convex (in particular, no three vertices are collinear);
- for each query, the given points and the polygon vertices do not coincide;
- the number of queries in the first format does not exceed 100.

Output

For each query, output a line containing a single integer: the answer to the query.

Example

standard input	*standard output*
5 3 0 0 2 0 2 1 1 2 0 2 1 1 1 2 1 1 2 2 1 2 2	1 1 2

Note

- For the first query, the only pair is (P_2, P_5) since $(1,1)$, $P_2 = (2,0)$ and $P_5 = (0,2)$ are collinear.
- For the second query, the only point is P_1 since $(1,1)$, $(2,2)$, and $P_1 = (0,0)$ are collinear.
- For the third query, the two pairs are (P_2, P_3) and (P_4, P_5).