Polygon Cutting

Time limit: *2000 ms*
Memory limit: *256 MB*

You are given a strictly convex polygon with N vertices and M diagonals of this polygon. These diagonals don't intersect in the interior of the polygon and cut the polygon into $M + 1$ pieces. Your task is to choose some set of pieces S so that the total area of pieces in S is maximized and no two pieces inside S share an edge. Output double the total area of that set.

Standard input

The first line contains two integers N and M. The next N lines contain descriptions of vertices of the polygon in clockwise order. The i-th of these lines contains two numbers x_i, y_i that are the coordinates of the i-th vertex. The next M lines contain descriptions of the diagonals. The i-th of these lines contains two integers u_i, v_i which represent a diagonal between vertices u_i and v_i.

Standard output

Output one line with double the total area of the bigger set in an optimal split of the polygon pieces.

Constraints and notes

- $3 \leq N \leq 1\,000\,000$,
- $1 \leq M \leq 1\,000\,000$,
- $|x_i|, |y_i| \leq 10^9$

Input	Output
4 1 -9 4 4 9 9 4 10 0 2 4	147
4 1 4 9 4 -9 -8 -6 -10 0 2 4	252
4 1 3 4 5 0 4 -3 -5 0 2 4	40