

Intersection

Input file: **standard input**
Output file: **standard output**
Time limit: 2 seconds
Memory limit: 64 megabytes

Bobo had n lines in 2-dimension coordinate axes. Each pair of them has **exactly one** intersection.

Bobo chose m of the $\binom{n}{2}$ intersections, and would like to find perimeter of the convex hull of unchosen intersections.

Note that the convex hull H of point set P is the minimum convex set containing P .

Input

The first line contains 2 integers n, m ($1 \leq n \leq 2 \times 10^5, 0 \leq m \leq 50$).

The i -th of the following n lines contains 3 integers a_i, b_i, c_i , which denotes the line $a_i x + b_i y = c_i$ ($|a_i|, |b_i|, |c_i| \leq 10^4, a_i^2 + b_i^2 > 0$).

The i -th of the following m lines contains 2 integers x_i, y_i , which denotes that the intersection of x_i -th and y_i -th lines is chosen by Bobo ($1 \leq x_i, y_i \leq n, x_i \neq y_i$).

Output

A real number denotes perimeter of the convex hull. Answer with absolute or relative error less than 10^{-6} is considered correct.

Examples

| standard input | standard output |
|---|-----------------|
| 3 0 1 0 0 0 1 0 1 1 1 | 3.4142135624 |
| 3 1 1 0 0 0 1 0 1 1 1 1 2 | 2.8284271247 |
| 1 0 1 1 1 | 0.0000000000 |
| 4 2 1 2 0 1 3 0 1 4 0 1 1 1 1 2 1 3 | 4.5532455610 |