Approximation

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	512 megabytes

fractal has a passion for clever approximations and a wooden board with n nails hammered into it. Each nail is uniquely numbered from 1 to n, and their positions on the board are fixed.

fractal loves experimenting with shapes, so he gives you q tasks. Each task specifies a range of nails by two numbers l and r, meaning only the nails numbered between l and r (inclusive) should be considered. *fractal* then stretches a rubber band tightly around these nails, forming a closed shape on the board. Formally speaking, *fractal* finds the convex hull of the nails.

Your job is to help *fractal* estimate the area enclosed by the rubber band for each task. *fractal* isn't too strict: your estimation is valid if it lies within the range $[S, 2S]$, where S is the actual area of the shape.

Input

First line contains two integers n, q ($1 \le n, q \le 2 \cdot 10^5$) — number of nails and number of queries.

Next n lines contain two integers x_i, y_i ($-10^9 \le x_i, y_i \le 10^9$) — coordinates of the i-th nail. The coordinates of the nails are guaranteed to be unique.

Next q lines contain two integers l_j, r_j ($1 \le l_j \le r_j \le n$) — range given by the j-th query.

Output

Output q lines, each containing an answer to the corresponding query. Your answer is considered correct if it lies in the range $[S, 2S]$, where S is the actual area of the shape.

You have to print numbers with at most one digit after the decimal point. This can be achieved by formatting the output using specific methods in different programming languages:

- **Python:** Use formatted strings with `:.1f` to round the number to one decimal place.
- **Java:** Use `System.out.printf` with `"%.1f"` to format the output with one decimal place.
- **C++:** Use `std::fixed` and `std::setprecision(1)` to ensure the number is printed with one decimal place.

Scoring

This problem contains 6 subtasks.

Subtask	Additional Constraints	Points
0	Examples	0
1	$x_i = 0$ or $x_i = 1$	11
2	$n, q \le 1000$	7
3	Rubber Band touches all of the nails.	13
4	x_i, y_i are generated randomly	15
5	$n, q \le 10^5$	34
6	—	20

Example

standard input	standard output
6 4 0 0 0 3 5 5 2 -5 4 2 2 -1 3 6 1 2 1 4 1 4	6.5 0 30 25

Note