Forrest's Run

Forrest Gump woke up one day and decided he wanted to run. Forrest has decided on several places he wants to visit during his run, but he is also determined to travel the furthest due East before turning around to come back home.

Help Forrest plan out the minimum distance route such that he can visit all of his planned destinations whilst adhering to the following rules.

- Forrest will always start his journey at the leftmost point
- He can then only travel to the right until he reaches the point furthest to the right
- Then, he can turn back and travel strictly to the left until he reaches his starting point

Input Format

The first line of input will contain the number of points that Forrest needs to visit. Each subsequent line of input will contain the (x, y) coordinates of a planned destination.

Constraints

$3 \leq n \leq 10^3$

$0 \leq x \leq 10^2$

$0 \leq y \leq 10^2$

Output Format

Output the distance travelled for the minimum distance route to two decimal places.

Sample Input 0

```
4
1 1
2 5
6 3
4 2
```

Sample Output 0

```
13.99
```

Explanation 0

The optimal route is $(1, 1) \rightarrow (2, 5) \rightarrow (6, 3) \rightarrow (4, 2) \rightarrow (1, 1)$.

This gives a total traveled distance of 13.99.

Sample Input 1

```
5
6 4
9 1
4 8
5 9
8 0
```

Sample Output 1

```
20.72
```