Foydalanuvchi Ma'lumotlari

Problem K. King's Cup

Input file:	standard input
Output file:	standard output
Time limit:	2 seconds
Memory limit:	1024 megabytes

For The King's Cup in Winter Sports, a new biathlon race format has been proposed.

The athlete starts from the base at point $(0,0)$ and must pass through N shooting ranges (where N is even). The rifle can hold ammunition for only two shooting ranges (and can only be reloaded after firing all the rounds), so after every two shooting ranges, the athlete returns to the base to get ammunition for the next two ranges — or for the finish line if all ranges have been completed. Between shooting ranges and between the base and a shooting range, the biathlete can only travel in a straight line connecting these two points. The only point that the biathlete is allowed to pass more than once is the base (which also means that no two segments of the path can intersect at internal points and that the biathlete must enter and exit each shooting range exactly once).

Given the coordinates of the shooting ranges, determine the minimum length of the route that the biathlete must take from the start to the finish.

Input

The first line of the input contains a single integer N — the number of shooting ranges ($2 \le N \le 500$, N is even).

Each of the following N lines contains two integers x_i and y_i — the coordinates of the corresponding shooting range ($-10^6 \le x_i, y_i \le 10^6$).

It is guaranteed that all key points (shooting ranges and the base) are distinct and no three of them lie on the same line.

Output

Output a single real number — the minimum length of the route that the biathlete must take from the start to the finish, with an absolute or relative error no worse than 10^{-6}.

Example

standard input	standard output
4 -1 1 -1 4 1 1 1 4	17.074638376

Asosiy Ma'lumotlar

Ism Familya	1
Telefon raqam	1
Tug'ilgan yil	1
Yo'nalish	Kompyuter mutaxassisi
Hudud	Qoraqalpog'iston Respublikasi
Millat	Boshqa
Ma'lumot	Oliy | Bakalavr
Oilaviy holat	Turmush qurgan

Ish Tajribasi

Ish tajribasi	1
Oylik maosh	1
Muddat	1
Sudlanganmi	Sudlanmagan

Ko'nikmalar va Dasturlar

Haydovchilik guvohnomasi	B ■
Shaxsiy avtomobil	Bor
Word dasturi bilish darajasi	100 %
Excel dasturi bilish darajasi	100 %
Boshqa dasturlar bilish darajasi	Yo'q