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Buritomath

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Compute the Area of a Polygon

by [PRASHANTB1984](#)

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You are given the cartesian coordinates of a set of points in a **2D** plane. When traversed sequentially, these points form a Polygon, **P**, which is not self-intersecting in nature. Can you compute the area of polygon **P**?

Input Format

The first line contains an integer, **N**, denoting the number of points.
The **N** subsequent lines each contain **2** space-separated integers denoting the respective **x** and **y** coordinates of a point.

Constraints

- No **2** points are *coincident*, and polygon **P** is obtained by traversing the points in a counter-clockwise direction.
- $4 \leq N \leq 1000$
- $0 \leq x, y \leq 1000$

Output Format

For each test case, print the area of **P** (correct to a scale of one decimal place).

Note: Do not add any leading/trailing spaces or units; it is assumed that your result is in square units.

Sample Input

```
4
0 0
0 1
1 1
1 0
```

Sample Output

```
1
```

Explanation

The given polygon is a square, and each of its sides are **1** unit in length.
area(P) = length × width = 1 × 1 = 1, so we print **1** on a new line.

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Submissions: [934](#)

Max Score: 20

Difficulty: Easy

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Racket



```
1 #lang racket
2 ; Enter your code here. Read input from STDIN. Print output to STDOUT
3
4 (define (polygon-area-iter points n sum)
5   (cond ((= n (length points)) (abs (if (= (remainder sum 2) 0) (/ sum 2) (/ sum 2.0))))
6   (else (polygon-area-iter
7           points
8           (+ n 1)
9           (+ sum (-
10                (* (car (list-ref points n)) (cdr (list-ref points (remainder (+ n 1) (length points))))))
11                (* (car (list-ref points (remainder (+ n 1) (length points)))) (cdr (list-ref points n))))))))))
12
13 (define (polygon-area points) (polygon-area-iter points 0 0))
14
15 (define (read-points n)
16   (cond ((= n 0) '())
17         (else (cons (cons (read) (read)) (read-points (- n 1))))))
18
19 (displayln (polygon-area (read-points (read))))
```

Line: 1 Col: 1

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