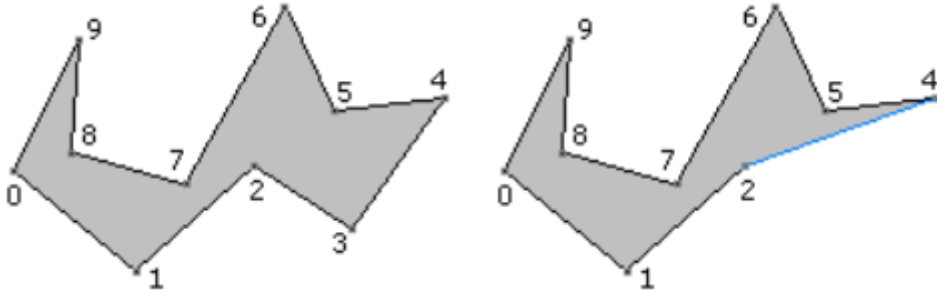# 12660   Ears Cutting

A famous way to cut polygon into triangles is ear cutting: each time cut off a triangle along a diagonal, after $n - 3$ cuts only a single triangle remains. In the following picture, the ear {2,3,4} was cut off.

Find a way to cut ears of a simple polygon such that the sum of cut lengths is minimal.

Input

There will be at most 30 test cases. The first line of each case contains the number of vertices, n ($4 \leq n \leq 100$). Each of the following n lines contains the coordinates of a vertex, in clockwise or counter-clockwise order. Coordinates are integers whose absolute value does not exceed 10000.

Output

For each test case, print the minimal sum of cut lengths, rounded to 4 decimal digits.

Sample Input

```
4
0 0
3 0
1 1
0 3
4
0 0
10 0
10 1
0 1
```

Sample Output

```
Case 1: 1.4142
Case 2: 10.0499
```