



PROBLEMS (/problems)
 STATUS (/status)
 RANKS (/ranks)

DISCUSS (<http://spoj.com/forum>)
 CONTESTS (/contests)
 (/manageaccount/)

PROFILE ▾

Problems (/problems) / classical (/problems/classical) / Build the Fence

My status (/status/BSHEEP,nadim_mahmud/) Status (/status/BSHEEP/) Ranking (/ranks/BSHEEP/)

BSHEEP - Build the Fence

#convex-hull (/problems/tag/convex-hull)

At the beginning of spring all the sheep move to the higher pastures in the mountains. If there are thousands of them, it is well worthwhile gathering them together in one place. But sheep don't like to leave their grass-lands. Help the shepherd and build him a fence which would surround all the sheep. The fence should have the smallest possible length! Assume that sheep are negligibly small and that they are not moving. Sometimes a few sheep are standing in the same place. If there is only one sheep, it is probably dying, so no fence is needed at all...

Input

t [the number of tests ≤ 100]
 [empty line]
 n [the number of sheep ≤ 100000]
 $x_1 y_1$ [coordinates of the first sheep]
 ...
 $x_n y_n$
 [integer coordinates from -10000 to 10000]
 [empty line]
 [other lists of sheep]

Text grouped in [] does not appear in the input file. Assume that sheep are numbered in the input order.

Output

o [length of circumference, rounded to 2 decimal places]
 p1 p2 ... pk
 [the sheep that are standing in the corners of the fence; the first one should be positioned bottommost and as far to the left as possible, the others ought to be written in

anticlockwise order; ignore all sheep standing in the same place but the first to appear in the input file; the number of sheep should be the smallest possible]

[empty line]

[next solutions]

Example

Input:

8

5

0 0

0 5

10 5

3 3

10 0

1

0 0

3

0 0

1 0

2 0

4

0 0

0 0

0 1

1 0

3

0 0

0 1

1 0

6

0 0

-1 -1

1 1

2 2

3 3

4 4

2

10 0

0 0

7

-3 -4

2 -3

4 3

-4 2

0 5

2 -3

-1 4

Output:

30.00

1 5 3 2

0.00

1

4.00

1 3

3.41

1 4 3

```

3.41
1 3 2

14.14
2 6

20.00
2 1

26.98
1 2 3 5 4

```

Warning: large Input/Output data, be careful with certain languages

[Submit solution! \(/submit/BSHEEP/\)](/submit/BSHEEP/)

hide comments

<	Previous	1	2 (/problems/BSHEEP/cstart=10)
3 (/problems/BSHEEP/cstart=20)		Next (/problems/BSHEEP/cstart=10)	
> (/problems/BSHEEP/cstart=20)			



imkiller (/users/imkiller): 2018-05-31 15:46:55
ConvexHull GoodOne!



jed010302 (/users/jed010302): 2018-02-19 01:23:59
Seems like there is no case where all points are collinear.



[Mayank Pratap] (/users/mayank_124): 2016-09-27 06:38:29
AC in one Go :) THink Simple.



Sanjit Majumdar (/users/sanjit): 2016-08-18 17:03:50
Got accepted in 0.45s using Andrew's monotone chain convex hull algorithm



Sampath Ravolaparthi (/users/rsampaths16): 2016-02-01 19:05:15
Hell No.....!!
Kept debugging my algo when I just had to change float to double
Forgot to keep the sum In mind and Only assumed for one segment.....!!



krypto_phile (/users/krypto_phile): 2016-01-19 19:54:17
Easy question. Absolutely straightforward! AC in 1 go :P



kartikay singh (/users/kart123): 2016-01-18 09:34:05
Easy convo hull :-)
Graham scan will be suffice :D

Last edit: 2016-01-18 09:34:25



CHANDAN KUMAR (/users/c_4034): 2016-01-18 08:26:36

My first convex hull problem really enjoying debugging it there are many corner

cases but think systematically easy in one go



Mayank Garg (/users/mynk): 2016-01-18 05:03:20

My first convex hull problem ... enjoyed solving and debugging it ;)



(Tjandra Satria Gunawan)(æ³æˆ™...æ~†) (/users/tjandra): 2015-08-08 14:18:23

First time I implemented full version of my own convex hull algo written in C :)

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Notes:

1. Don't post any source code here.
2. Please be careful, leave short comments only. Don't spam here.
3. For more discussion (hints, ideas, solutions) please visit our forum (/forum).
4. Authors of the problems are allowed to delete the post and use html code here (e.g. to provide some useful links).

✈ Submit solution! (/submit/BSHEEP/)

Added by: mima (/users/mima)
 Date: 2004-06-01
 Time limit: 7s
 Source limit: 50000B
 Memory limit: 1536MB
 Cluster: Cube (Intel G860) (/clusters/)
 Languages: All except: NODEJS PERL6
 VB.NET
 Resource: -

Vote requirements



- ✓ be spoj user for at least 5 days

- ✓ solve at least 15 problems
- ✗ solve this problem


Own tags

#sqrt-decomp-2 # # # # # # #

#

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