D - Freckles

In an episode of the Dick Van Dyke show, little Richie connects the freckles on his Dad's back to form a picture of the Liberty Bell. Alas, one of the freckles turns out to be a scar, so his Ripley's engagement falls through.

Consider Dick's back to be a geometric plane with freckles at various (x,y) coordinates. Your job is to tell Richie how to connect the dots so as to minimize the amount of ink used. Richie connects the dots by drawing straight lines between pairs, possibly lifting the pen between lines. When Richie is done, there must be a sequence of connected lines from any freckle to any other freckle.

Input

The input begins with a single positive integer on a line by itself indicating the number of test cases to follow. Each test case begins with an integer N ($0 < N \leq 100$) indicating the number of freckles on Dick's back. Next are N lines, each containing the (x, y) coordinates of a single freckle.

Output

For each test case, output a single floating-point value, rounded to two decimal places, indicating the minimum total length of ink lines required to connect all the freckles. Print a blank line between the outputs.

Sample Input

```
2
3
1.0 1.0
2.0 2.0
2.0 4.0
4
2.0 5.0
3.0 6.0
1.0 4.5
3.2 8.0
```

Sample Output

```
3.41

4.54
```