Problem D - Dessert Splitting

To take a break from the arcade, Daniel and David decide to buy a cake and share it. The cake is a convex polygon when viewed from above.

To split the cake, they decided that David cuts the cake in half and Daniel will get the first choice of which half he'll get.

David will cut the cake in a straight line through two vertices of the convex polygon.

Daniel is hungry, so he'll always choose the bigger piece. David is hungry too, so he wants to cut the cake as fairly as possible.

Help David determine the best way for him to cut the cake!

Input

The first line contains the number of test cases T.

Each test case begins with a single integer n ($3 \leq n \leq 100,000$), the number of points on the convex polygon describing the cake.

The following n lines each contain 2 numbers x, y ($-10^8 \leq x, y \leq 10^8$) giving the vertices of the convex polygon in clockwise order.

Output

Output for each test case two numbers in a single line, the area of the cake that Daniel gets and the area of the cake that David will get.

Your answer will be accepted if it lies within 10^{-4} of the correct answer in either absolute or relative error.

Sample Input

```
3
3
0 0
0 100
-100 0
4
0 0
0 3
1 4
4 0
4
0 0
3 0
3 3
0 3
```

Sample Output

```
5000.000 0.000
6.000 3.500
4.500 4.500
```