

Best Fit

You are given a sequence of N random values ($s_1, s_2, s_3, s_4, \dots, s_N$) You have to find a function $f(t) = a \cdot t + b$ such that the Euclidean Distance between the given sequence and the function values where t varies from 1 to N is minimum.

In effect, you have to minimize

□

Output the values a and b for each test case, rounded up to 4 decimal places.

Input

Line 1: T /* Number of test cases $T \leq 1000$ */

Line 2: N /* Number of values in first test case $N \leq 10000$ */

Line 3: $s_1 s_2 s_3 s_4 \dots s_N$ /* all values are less than 10000 and integers */

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. .
. . .

Output

$a b$ /* Output the values a and b rounded to 4 decimal places for each test case */

Example

Input:

```
3
3
1 1 1
3
1 2 3
3
1 3 1
```

Output:

```
0.0000 1.0000
1.0000 0.0000
0.0000 1.6667
```