

Standard Deviation

Time Limit : 1 sec, Memory Limit : 131072 KB

Standard Deviation

You have final scores of an examination for n students. Calculate standard deviation of the scores $s_1, s_2 \dots s_n$.

The variance α^2 is defined by

$$\alpha^2 = (\sum_{i=1}^n (s_i - m)^2) / n$$

where m is an average of s_i . The standard deviation of the scores is the square root of their variance.

Input

The input consists of multiple datasets. Each dataset is given in the following format:

```
 $n$   
 $s_1 \ s_2 \ \dots \ s_n$ 
```

The input ends with single zero for n .

Output

For each dataset, print the standard deviation in a line. The output should not contain an absolute error greater than 10^{-4} .

Constraints

- $n \leq 1000$
- $0 \leq s_i \leq 100$

Sample Input

```
5  
70 80 100 90 20  
3  
80 80 80  
0
```

Sample Output

```
27.85677655  
0.00000000
```

Source: https://onlinejudge.u-aizu.ac.jp/problems/ITP1_10_C