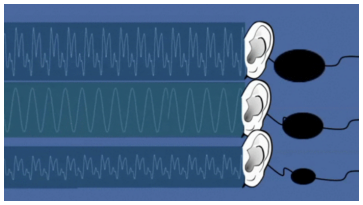
E Equalising Audio

Time limit: 4s



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As a radio engineer at the Balanced Audio Podcast © your job is to deliver an equal listening experience at all times. You did a poll among the listeners and they are especially concerned about fluctuations in loudness. To resolve this you bought a transformer to equalise the audio, but alas, its software got corrupted during transport.

Your job is to rewrite the equalising software. As input the transformer gets n amplitudes $a_1, \ldots, a_n$, with an average perceived loudness of $\frac{1}{n}\sum_{i=1}^{n} a_i^2$. The output should contain the same amplitudes, but renormalised by some constant positive factor, such that the average perceived loudness is x. There is one exception: total silence should always be preserved.

Input

The input consists of:

- One line with a two integers n and x ($1 \leq n \leq 10^5$, $0 \leq x \leq 10^6$), the number of amplitudes and the average perceived loudness to achieve.
- One line with n integers $a_1, \ldots, a_n$ ($|a_i| \leq 10^6$), the amplitudes.

Output

Output one line containing n numbers, the renormalised amplitudes with an average perceived loudness of x.

Your answers should have an absolute or relative error of at most 10^{-6}.

Sample Input 1

```
5 6
0 1 -2 3 -4
```

Sample Output 1

```
0 1 -2 3 -4
```

Sample Input 2

```
4 1
1 3 3 7
```

Sample Output 2

```
0.242535625 0.7276068751 0.7276068751 1.697749375
```