# Discrete Fourier Transform

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|---|---|
| Input file: | `standard input` |
| Output file: | `standard output` |
| Time limit: | 2 seconds |
| Memory limit: | 512 megabytes |

Given a sequence of integer $f_0, f_1, \ldots, f_{n-1}$, the discrete Fourier transform gives a sequence of complex numbers $F_0, F_1, \ldots, F_{n-1}$ that

$$F_t = \sum_{s=0}^{n-1} f_s \; e^{-2\pi ist/n}$$

for each $t = 0, 1, \ldots, n-1$, where $e^{i\theta} = \cos\theta + i\sin\theta$, and $i$ is the imaginary unit that $i^2 = -1$.

You may reset $f_k$ to any integer value to minimize the maximum value among $|F_0|, |F_1|, \ldots, |F_{n-1}|$, where $|z| = |p + qi| = \sqrt{p^2 + q^2}$ $(p, q \in \mathbb{R})$ is the modulus of the complex number $z$.

## Input

The first line contains two integers $n$ $(1 \le n \le 2\,000)$ and $k$ $(0 \le k < n)$.

The second line contains $n$ integers $f_0, f_1, \ldots, f_{n-1}$ $(-2\,000 \le f_i \le 2\,000)$.

## Output

Output a line containing a single real number, indicating the minimum of the maximum value among $|F_0|, |F_1|, \ldots, |F_{n-1}|$ after resetting $f_k$ to any integer value.

Your answer is acceptable if its absolute or relative error does not exceed $10^{-9}$. Formally speaking, suppose that your output is $a$ and the jury's answer is $b$, your output is accepted if and only if $\frac{|a-b|}{\max\{1,|b|\}} \le 10^{-9}$.

## Example

| standard input | standard output |
|---|---|
| 3 2<br>1 1 0 | 2.0 |