IOI & EGOI Team Selection Test

2025

Train

Time limit: 4 seconds **Memory limit: 256 MB**

You are in charge of loading cargo into a train with W wagons. Each wagon of the train can hold either 0, 1, or 2 cargo items. You have to load $1 \leq C \leq 2W$ cargo items, each with a given mass M_i onto the train for $1 \leq i \leq C$. You have to load the cargo items in such a way that the total imbalance is minimized. The imbalance is computed in the following way: The average of the mass is computed as $A = (M_1 + M_2 + \ldots + M_C)/W$ and the imbalance $I = |X_1 - A| + \ldots + |X_W - A|$ where X_j is the sum of the masses of the cargo loaded in wagon j for $1 \leq j \leq W$.

Task

For given numbers W, C and a list of masses M_i compute the minimal imbalance.

Input

The first line contains the two numbers W and C separated by a space.
The next line contains C numbers M_i, the weights of the cargo items, separated by spaces.

Output

The minimal imbalance.

Constraints

- $1 \leq W \leq 1000$.
- $0 \leq M_i \leq 1000$.
- The average is always an entire number.

Subtasks

Subtask	Score	Description
1	15	$W \leq 5$.
2	85	No additional constraints

Examples

Input

```
3 6
5 1 2 7 0 0
```

Output

```
4
```

The average is $(5 + 1 + 2 + 7 + 0 + 0)/3 = 5$ and it is optimal to store in the first wagon cargo items $(4, 5)$, in the second wagon items $(1, 6)$ and in the last wagon $(2, 3)$. This leads to an imbalance of $|7 + 0–5| + |5 + 0–5| + |1 + 2–5| = 2 + 0 + 2 = 4$.