# Fire Station

The city of Davos wants to build a new fire station. A new construction site should be chosen for this, so that the distance to the most remote house is as small as possible. If there is more than one possible construction site, the site closest to Klosters should be preferred.

Everyone who ever was in Davos knows, that Davos lies in a valley and is a single long street. The houses are given as integers $h_i$ on that street (for all $i$ with $1 \leq i \leq n$). Find an integer $f$ such that $\max_{1 \leq i \leq n} |h_i - f|$ is as small as possible. If there is more than one such $f$, print the one that is closest to $-10^{100}$, the position of the city of Klosters. As no existing house should get destroyed, we further want $f \neq h_i$ (for all $i$ with $1 \leq i \leq n$).

## Input

The first line consists of $n$, the number of houses. After that $n$ lines follow, where line $i$ contains the number $h_i$. The $h_i$ are integers and pairwise distinct ($h_i \neq h_j$ if $i \neq j$ for all $i, j$ with $1 \leq i, j \leq n$).

## Output

Output the integer $f$ closest to $-10^{100}$, such that $\max_{1 \leq i \leq n} |h_i - f|$ is as small as possible and $f \neq h_i$ for all $1 \leq i \leq n$.

## Limits

The test cases contain 5 test groups, each worth 20 points.

- In group 1 we have $n \leq 100$, $1 \leq h_i \leq 100$ (for all $i$ with $1 \leq i \leq n$) and the best-situated construction sites are always free, so $f \neq h_i$ (for all $i$ with $1 \leq i \leq n$) holds for all $f$ with minimal $\max_{1 \leq i \leq n} |h_i - f|$.
- In group 2 we have $n \leq 1\,000$ and $1 \leq h_i \leq 10^9$ (for all $i$ with $1 \leq i \leq n$).
- In group 3 we have $n \leq 10\,000$ and $-10^9 \leq h_i \leq 10^9$ (for all $i$ with $1 \leq i \leq n$).
- In group 4 we have $n \leq 100\,000$ and $1 \leq h_i \leq 10^{18}$ (for all $i$ with $1 \leq i \leq n$).
- In group 5 we have $n \leq 100\,000$ and $-10^{18} \leq h_i \leq 10^{18}$ (for all $i$ with $1 \leq i \leq n$).

## Examples

| Input | Output |
|---|---|
| 5<br>11 5 2 10 8 | 6 |

*The fire station would have minimal distance* 5 *to the houses at both position* 6 *and* 7*, but position* 6 *is close to* $-10^{100}$*. In test group 1 it would be guaranteed that there is no house at position* 6 *and* 7*.*

| Input | Output |
|---|---|
| 3<br>1 3 5 | 2 |

*The best position* 3 *is already taken. Out of positions* 2 *and* 4*, position* 2 *is closer to* $-10^{100}$.

| Input | Output |
|---|---|
| 7<br>1 4 5 6 7 8 12 | 9 |

*The best fire stations would be at position* 6 *and* 7 *(distance* 6*), but they are already occupied;. Also positions* 5 *and* 8 *(each with distance* 7*) and* 4 *(distance* 8*). Position* 9 *with distance* 8 *is the next free position.*

| Input | Output |
|---|---|
| 2<br>-2 -3 | -4 |

*Out of the two potential positions* $-1$ *and* $-4$*,* $-4$ *is closer to* $-10^{100}$.