

Subset Mex

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 256 megabytes

Given a multiset S . You may do the following operation any number of times:

1. Choose a subset $T \subseteq S$ (possibly empty).
2. Erase T from S .
3. Insert $MEX(T)$ to S .

Find the minimum number of operations you have to do so that $n \in S$.

Since $|S|$ may be large, you'll be given an array f where f_i represents the frequency of the number i in S .

Input

The first line contains a single integer n ($1 \leq n \leq 50$).

The second line contains n integers f_0, f_1, \dots, f_{n-1} ($0 \leq f_i \leq 10^{16}$).

Output

Print the minimum number of operations needed to satisfy the condition.

Scoring

Subtask #1: $n \leq 2$

Subtask #2: $n \leq 20$

Subtask #3: $f_i = 0$

Subtask #4: $f_i \leq 1$

Subtask #5: $f_i \leq 2000$

Subtask #6: $f_0 \leq 10^{16}$ and $f_j = 0$ (for all $j \neq 0$)

Subtask #7: $f_i \leq 10^{16}$ and $f_j = 0$ (for all $j \neq i$)

Subtask #8: No additional constraints

Examples

standard input	standard output
4 0 3 0 3	4
5 4 1 0 2 0	10

Note

In the first example, initially, $S = \{1, 1, 1, 3, 3, 3\}$ and our goal is to have 4 in S . We can do the following:

1. choose $T = \{\}$ then S becomes $\{0, 1, 1, 1, 3, 3, 3\}$
2. choose $T = \{0, 1, 3\}$ then S becomes $\{1, 1, 2, 3, 3\}$
3. choose $T = \{1\}$ then S becomes $\{0, 1, 2, 3, 3\}$
4. choose $T = \{0, 1, 2, 3\}$ then S becomes $\{3, 4\}$