

Problem I. Maximum Subsequence

Input file: *standard input*
Output file: *standard output*
Time limit: 2 seconds
Memory limit: 1024 mebibytes

For a sequence $a_{1\dots n}$, define $f(a)$ as

$$f(a) = \max_{1 \leq l \leq r \leq n} \sum_{i=l}^r a_i.$$

Given a sequence $b_{1\dots n}$, you need to permute $b_{1\dots n}$ to get $b'_{1\dots n}$ and minimize $f(b')$.

Input

The first line contains a single integer n ($1 \leq n \leq 16$).

The second line contains n integers $a_{1\dots n}$ ($|a_i| \leq 10^5$).

Output

Output the minimum possible $f(b')$.

Examples

standard input	standard output
4 1 -1 1 1	2
6 4 -4 5 -20 6 7	9