Problem H. Subsequence Sums

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	512 mebibytes

Yuta has a sequence of n positive integers $A_1, \ldots, A_n$, and their sum is m. For each subsequence S of A, he calculated the sum of elements in this subsequence.

So, now Yuta has also got 2^n integers between 0 and m. For each $i \in [0, m]$, let B_i be the number of integers i he got.

Yuta shows you the array B_i, and he asks you to restore $A_1, \ldots, A_n$. If there are several possibilities, find the lexicographically smallest possible sequence.

Input

The first line of the input contains two integers n and m ($1 \le n \le 50$, $1 \le m \le 10^4$).

The second line contains $m + 1$ integers $B_0, \ldots, B_m$ ($0 \le B_i \le 2^n$).

Output

Print a single line with n integers $A_1, \ldots, A_n$.

It is guaranteed that there exists at least one solution. And if there are several possible solutions, print the **lexicographically smallest** one.

Examples

standard input	standard output
2 3 1 1 1 1	1 2
3 3 1 3 3 1	1 1 1

Note

In the first example, A is $[1, 2]$. A has four subsequences [], [1], [2] and $[1, 2]$, and the sums for them are 0, 1, 2 and 3. So, $B = [1, 1, 1, 1]$.