Balance beam (1) P18679_en

A gymnast is at the midpoint of a balance beam of length m. The gymnast must jump n times forward or backward, never leaving the bar. The i-th jump has length ℓ_i. Write a program to compute all the positions where the gymnast can finish her exercise. The gymnast cannot skip any jump, nor change the order of the jumps.

Input

Input consist of the length m, the number n, and the lengths $\ell_1, \ldots, \ell_n$. Assume $2 \leq m \leq 10^9$, that m is even, $0 \leq n \leq 18$, and $1 \leq \ell_i \leq 10^8$.

Output

Assuming that the initial position is 0 (hence, the valid positions belong to $[-m/2, m/2]$), print all the positions where the gymnast can finish. Every position must occur as many times as combinations of jumps make it possible.

Information about the checker

You can print the solutions to this exercise in any order.

Sample input 1

```
1000 3
100 10 1
```

Sample output 1

```
111
109
91
89
-89
-91
-109
-111
```

Sample input 2

```
40 2
10 10
```

Sample output 2

```
20
0
0
-20
```

Sample input 3

```
1000 0
```

Sample output 3

```
0
```

Sample input 4

```
10 1
100
```

Sample output 4

Sample input 5

```
30 4
5 1 20 2
```

Sample output 5

```
-12
12
```

Sample input 6

```
6 5
1 1 1 1 1
```

Sample output 6

```
3
1
3
1
1
-1
3
1
1
-1
1
-1
-1
-3
3
1
1
-1
1
-1
-1
-3
1
-1
-1
-3
-1
-3
```

Problem information

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