A. Memory and Crow

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

There are n integers $b_1, b_2, ..., b_n$ written in a row. For all i from 1 to n, values a_i are defined by the crows performing the following procedure:

- The crow sets a_i initially 0.
- The crow then adds b_i to a_i, subtracts b_{i+1}, adds the b_{i+2} number, and so on until the n'th number. Thus, $a_i = b_i - b_{i+1} + b_{i+2} - b_{i+3}....$

Memory gives you the values $a_1, a_2, ..., a_n$, and he now wants you to find the initial numbers $b_1, b_2, ..., b_n$ written in the row? Can you do it?

Input

The first line of the input contains a single integer n ($2 \le n \le 100\,000$) — the number of integers written in the row.

The next line contains n, the i'th of which is a_i ($-10^9 \le a_i \le 10^9$) — the value of the i'th number.

Output

Print n integers corresponding to the sequence $b_1, b_2, ..., b_n$. It's guaranteed that the answer is unique and fits in 32-bit integer type.

Examples

input
5 6 -4 8 -2 3

output
2 4 6 1 3

input
5 3 -2 -1 5 6

output
1 -3 4 11 6

Note

In the first sample test, the crows report the numbers $6, -4, 8, -2$, and 3 when he starts at indices $1, 2, 3, 4$ and 5 respectively. It is easy to check that the sequence $2\ 4\ 6\ 1\ 3$ satisfies the reports. For example, $6 = 2 - 4 + 6 - 1 + 3$, and $-4 = 4 - 6 + 1 - 3$.

In the second sample test, the sequence $1, -3, 4, 11, 6$ satisfies the reports. For example, $5 = 11 - 6$ and $6 = 6$.