

Problem A: Add Add Add

- Time Limit: 2 sec

Problem Statement

You are given two sequences of positive integers of length N , (A_1, A_2, \dots, A_N) and (B_1, B_2, \dots, B_N) .
For $k = 2, 3, \dots, 2N$, compute the value of $\sum_{i+j \leq k} (A_i + B_j)$, that is, the sum of $(A_i + B_j)$ for all indices (i, j) such that $i + j \leq k$ and $1 \leq i, j \leq N$.

Input

The input is given in the following format:

N
 $A_1 \ A_2 \ \dots \ A_N$
 $B_1 \ B_2 \ \dots \ B_N$

- $1 \leq N \leq 200,000$
- $1 \leq A_i, B_i \leq 10^6$ ($1 \leq i \leq N$)
- All input values are integers.

Output

Output $2N - 1$ lines. On the i -th line ($1 \leq i \leq 2N - 1$), output the answer for the case where $k = i + 1$.

Sample Input 1	Sample Output 1
3 1 1 1 1 1 1	2 6 12 16 18
Sample Input 2	Sample Output 2
5 3 7 1 8 3 7 10 5 3 4	10 37 70 114 165 206 230 248 255
Sample Input 3	Sample Output 3
1 3 5	8