

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
A1 A2 ... AN
B1 B2 ... BN
```

- $1 \leq N \leq 200,000$
- $1 \leq A_i, B_i \leq 10^6$ ($1 \leq i \leq N$)
- 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

```
3
1 1 1
1 1 1
```

Sample Output 1

```
2
6
12
16
18
```

Sample Input 2

```
5
3 7 1 8 3
7 10 5 3 4
```

Sample Output 2

```
10
37
70
114
165
206
230
248
255
```

Sample Input 3

```
1
3
5
```

Sample Output 3

```
8
```