

DMPG '18 S2 - Mimi and K-uteness

Mimi decides to play a game with the following rules:

A k -subarray is a subarray of length k .

The k -uteness of an array A is defined as the sum of the sum of all k -subarrays of A .

The winner is the person who can output the k -uteness of A for $k = 1, 2, 3, \dots, N$, where N is the number of elements in A . Can you beat Mimi?

Constraints

For all subtasks, $1 \leq A_i \leq 10^9$.

Subtask 1 [10%]

$1 \leq N \leq 500$

Subtask 2 [10%]

$1 \leq N \leq 2\,000$

Subtask 3 [80%]

$1 \leq N \leq 200\,000$

Input Specification

The first line of input will contain a single integer, N .

The next line of input will contain N space separated integers, A_1, A_2, \dots, A_N .

Output Specification

N lines, with the k^{th} line being the k -uteness of the array.

Sample Input

```
5
1 1 1 1 1
```

Sample Output

5
8
9
8
5