Problem L
Oil Factory

Time limit: **2 seconds**
Mem limit: **256 Megabytes**

In an oil factory in southern Vietnam, there are n containers in a row. A specialized robot can do 2 types of operations.

1. In the first operation, the robot will pour out half of the oil in all containers that currently have even liters of oil.
2. In the second operation, the robot will pour out 1 liter out of all containers that currently have odd liters of oil.

Given a sequence of operations, display the total liters of oils in all containers after each time the robot finishes an operation.

Input

The first line contains an integer n - the number of containers ($1 \leq n \leq 10^5$).

The second line contains n integers a_i separated by spaces ($1 \leq a_i \leq 2^{30} - 1$) - the current liters of oil in each container.

The third line contains a sequence of operations in the form of characters "`0`" (first operation) and "`1`" (second operation)

The number of operations ranges from 1 to 10^5.

Output

After each command, print the sum of oil (in liters) in all containers on a separate line.

Sample input

Sample output

Sample input	Sample output
5 1 2 3 4 5 0110	12 8 8 4
3 1 1 1 01	3 0