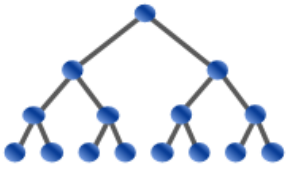
USA Computing Olympiad



USACO 2025 January Contest, Platinum
Problem 3. Watering the Plants

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Contest has ended.

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English (en)

Bessie's garden has N plants labeled 1 through N ($2 \leq N \leq 5 \cdot 10^5$) from left to right. Bessie knows that plant i requires at least w_i ($0 \leq w_i \leq 10^6$) units of water.

Bessie has a very peculiar irrigation system with $N-1$ canals, numbered 1 through $N-1$. Each canal i has an associated unit cost c_i ($1 \leq c_i \leq 10^6$), such that Bessie can pay $c_i k$ to provide plants i and $i+1$ each with k units of water, where k is a non-negative integer.

Bessie is busy and may not have time to use all the canals. For each $2 \leq i \leq N$ compute the minimum cost required to water plants 1 through i **using only the first** $i-1$ **canals**.

INPUT FORMAT (input arrives from the terminal / stdin):

The first line contains a single positive integer N.

The second line contains N space-separated integers $w_1, \ldots, w_N$.

The third line contains $N-1$ space-separated integers $c_1, \ldots, c_{N-1}$.

OUTPUT FORMAT (print output to the terminal / stdout):

Output $N-1$ newline-separated integers. The $(i-1)$th integer should contain the minimum cost to water the first i plants using the first $i-1$ canals.

SAMPLE INPUT:

```
3
39 69 33
30 29
```

SAMPLE OUTPUT:

```
2070
2127
```

The minimum cost to water the first 2 plants using the first canal is to pay $30 \cdot 69 = 2070$ by using the first canal 69 times.

The minimum cost to water the first 3 plants is to use the first canal 39 times and the second canal 33 times, paying $39 \cdot 30 + 29 \cdot 33 = 2127$.

SAMPLE INPUT:

```
3
33 82 36
19 1
```

SAMPLE OUTPUT:

```
1558
676
```

SAMPLE INPUT:

```
8
35 89 44 1 35 3 62 50
7 86 94 62 63 9 49
```

SAMPLE OUTPUT:

```
623
4099
4114
6269
```

```
6272
6827
8827
```

SCORING:

- Input 4: $N \leq 200$, and all $w_i \leq 200$.
- Inputs 5-6: All $w_i \leq 200$.
- Inputs 7-10: $N \leq 5000$.
- Inputs 11-14: All w_i and c_i are generated independently and uniformly at random.
- Inputs 15-19: No additional constraints.

Problem credits: Benjamin Qi

Contest has ended. No further submissions allowed.