3 Maximum Advertisement Revenue

Problem Introduction

You have n ads to place on a popular Internet page. For each ad, you know how much is the advertiser willing to pay for one click on this ad. You have set up n slots on your page and estimated the expected number of clicks per day for each slot. Now, your goal is to distribute the ads among the slots to maximize the total revenue.

Problem Description

Task. Given two sequences $a_1, a_2, \ldots, a_n$ (a_i is the profit per click of the i-th ad) and $b_1, b_2, \ldots, b_n$ (b_i is the average number of clicks per day of the i-th slot), we need to partition them into n pairs (a_i, b_j) such that the sum of their products is maximized.

Input Format. The first line contains an integer n, the second one contains a sequence of integers $a_1, a_2, \ldots, a_n$, the third one contains a sequence of integers $b_1, b_2, \ldots, b_n$.

Constraints. $1 \le n \le 10^3$; $-10^5 \le a_i, b_i \le 10^5$ for all $1 \le i \le n$.

Output Format. Output the maximum value of $\sum_{i=1}^{n} a_i c_i$, where $c_1, c_2, \ldots, c_n$ is a permutation of $b_1, b_2, \ldots, b_n$.

Sample 1.

Input:

```
1
23
39
```

Output:

```
897
```

$897 = 23 \cdot 39$.

Sample 2.

Input:

```
3
1 3 -5
-2 4 1
```

Output:

```
23
```

$23 = 3 \cdot 4 + 1 \cdot 1 + (-5) \cdot (-2)$.

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