IOI Training Camp 2010 – Final 3, 27 June, 2010

Problem 0 The Constant Gardener[1]

At Jardin Luxembourg, palm trees are grown in large boxes on wheels, so that they can be moved around. K palm trees are currently lined up along one side of a walkway at positions $p_1, p_2, \ldots, p_K$, where the p_i's are distinct integers greater than or equal to 1.

The gardener is a restless man. Since it is Sunday, he would like to change the arrangement of the palm trees. He would like to place them at positions $q_1, q_2, \ldots, q_K$, where again the q_i's are distinct integers greater than or equal to 1. This will involve moving some of the palm trees and he would like to minimize the total distance moved by all the palm trees.

Suppose there are four palm trees at positions $3, 4, 6, 8$, and he would like them to be placed at positions $2, 5, 6, 10$. By moving the first tree left by one step, the second one right by one step and the last tree right by two steps, he can achieve this in four moves. You can verify that this is the best possible. Your task is to help him determine the minimum total distance by which the trees are to be moved.

Input format

The first line contains an integer K, the number of trees. This is followed by two lines containing K integers each, giving the current configuration and the desired configuration of the trees, respectively. Both configurations are given as increasing sequences of integers.

Output format

A single line with a single integer giving the minimum total distance by which the trees have to be moved.

Test Data

You may assume that $1 \leq K \leq 1000$ and that all input data and the final answer will fit in 32-bit signed integers.

[1] Problem formulated by Harpreet

Sample input

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4
3 4 6 8
2 5 6 10
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Sample output

```
4
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Time and memory limits

The time limit for this task is 1 second. The memory limit is 44 MB (actual limit 32 MB, plus 12 MB buffer for 64-bit compilation).