

# Degree Sequence 3

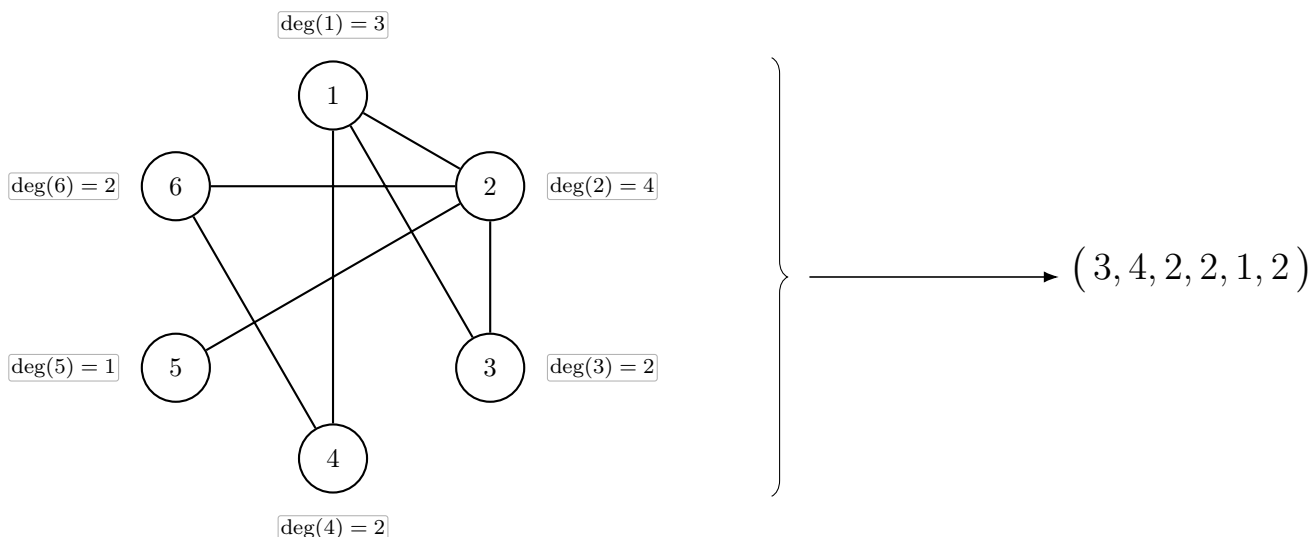
Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            **6 seconds**  
Memory limit:         **1024 megabytes**

In *The 2nd Universal Cup Semifinals*, you discover some records of the Mayan civilization's study of graph theory at Chichén Itzá,. Among the ruins, you found some *degree sequences* of some trees recorded by the ancient Maya.

Later, at the *2024 ICPC Training Camp* in Gui'an, you may (or may not) have solved the task *Degree Sequence 2*. Little Cyan Fish is eager to share that problem with you, but since the contest might appear as a regular stage in The 4th Universal Cup, he cannot reveal it just yet.

But don't be disappointed! Who said you must solve Degree Sequence 2 before attempting Degree Sequence 3? Here it is!

Recall the definition of the degree sequence: for an **undirected, simple** (i.e. no multiple edges or self loops) graph of  $n$  vertices, its degree sequence is an integer sequence of length  $n$ , denoted by  $d_1, d_2, \dots, d_n$ , such that  $d_i$  equals to the degree (i.e. the number of edges that are incident to the vertex) of the vertex  $i$ .



A *sequence*  $a$  is said to be *graphic*, or a *valid degree sequence*, if there exists a simple undirected graph, such that the degree sequence of the graph is exactly  $a$ . For example,  $(3, 4, 2, 2, 1, 2)$  is a valid degree sequence, as the graph described above will give it as a degree sequence.

Now, Little Cyan Fish gives you a sequence  $a_1, a_2, \dots, a_n$ . Little Cyan Fish wants you to convert the sequence to a valid *degree sequence* of a simple undirected graph. To do that, Little Cyan Fish can perform the following operations as many times as he wants:

- Choose an index  $1 \leq i \leq n$  and update  $a_i \leftarrow a_i - 1$ . The cost of such operation is  $b_i$  dollars.
- Choose an index  $1 \leq i \leq n$  and update  $a_i \leftarrow a_i + 1$ . The cost of such operation is also  $b_i$  dollars.

Given the sequences  $a$  and  $b$ , your task is to find the minimum total cost to convert the sequence  $a$  into a valid degree sequence.

## Input

There are multiple test cases in a single test file. The first line of the input contains an integer  $T$  ( $T \geq 1$ ), indicating the number of test cases. For each test case:

The first line contains a single integer  $n$  ( $1 \leq n \leq 10^5$ ).

The next line of the input contains  $n$  integers  $a_1, a_2, \dots, a_n$  ( $0 \leq a_i \leq n$ ), indicating the initial sequence. The next line of the input contains  $n$  integers  $b_1, b_2, \dots, b_n$  ( $1 \leq b_i \leq n$ ), indicating the cost to make a change.

It is guaranteed that the sum of  $n$  over all test cases does not exceed  $10^6$ .

## Output

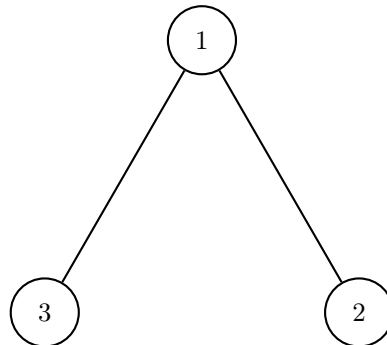
For each test case, output a single line containing a single integer, indicating the answer.

## Example

standard input	standard output
3	0
3	1
2 1 1	10002
100 1000 10000	
3	
2 1 0	
100 10 1	
5	
1 2 3 4 5	
1 10 100 1000 10000	

## Note

For the first test case, we do not need to perform any operations, as  $(2, 1, 1)$  is already a valid degree sequence.



For the second test case, the optimal plan is to update  $a_3 \leftarrow a_3 + 1$ , so that the sequence  $a$  becomes  $(2, 1, 1)$ . The total cost is  $b_3 = 1$ .

For the third test case, the optimal plan is to update  $a_5 \leftarrow a_5 - 1$ , and then update  $a_1 \leftarrow a_1 + 1$  twice, so that the sequence  $a$  becomes  $(3, 2, 3, 4, 4)$ . The total cost is  $2 \cdot b_1 + b_5 = 10002$ .

