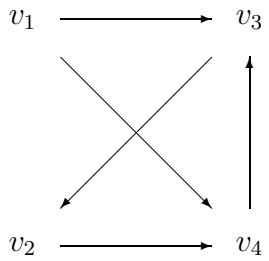
INOI Training Camp 2005 - Finals (Day 1)

27 June 2005

Problem 1: Evil intentions

Tanmoy is searching for some special directed graphs so that he can force 90% of the submissions to time out. For each graph, his test data generator requires the vertices v_1, v_2, ..., v_N to have indegrees i_1, i_2, ..., i_N and outdegrees o_1, o_2, ..., o_N.

For instance, suppose the sequence of indegrees required is 0,1,2,2 and the sequence of outdegrees required is 2,1,1,1. Here is a graph with the required properties.



Your task is to help him construct a graph that meets his requirements or report that no such graph exists, so Tanmoy has to find another way to achieve his evil goal.

Input format

The first line of the input contains one integer N indicating the number of vertices in the graph to be constructed. The second line of input is a sequence of N nonnegative integers, giving the indegrees of vertices 1,2,..,N. The third line of input is a sequence of N nonnegative integers, giving the outdegrees of vertices 1,2,..,N.

Output format

If it is not possible to construct a graph that meets the requirements, print a single line of output saying `NO`.

If it is possible to construct a graph that meets the requirements, the first line of output should say `YES`. The rest of your output should describe a graph that meets the requirements. Print out the edges of the graph, one edge per line. Each edge is specified by two integers, the source vertex and the target vertex. If there is more than one graph that meets the requirements, it suffices to print any one.

Test Data

You may assume $N \leq 200$. The sum of the indegrees is bounded by 2500.

Example

Here is the sample input and output corresponding to the above example.

Sample input

```
4
0 1 2 2
2 1 1 1
```

Sample output

```
YES
1 3
4 3
3 2
2 4
1 4
```