code jam
hello, world!

Problem A. **Minimum Scalar Product**

Round 1A 2008

A. Minimum Scalar Product

B. Milkshakes

C. Numbers

Contest Analysis

Questions asked ☐ 3

This contest is open for practice. You can try every problem as many times as you like, though we won't keep track of which problems you solve. Read the Quick-Start Guide to get started.

Small input 5 points	Solve A-small
Large input 10 points	Solve A-large

Submissions

Minimum Scalar Product

5pt	Not attempted **2352/2567 users** correct (92%)
10pt	Not attempted **1048/2336 users** correct (45%)

Milkshakes

10pt	Not attempted **655/1042 users** correct (63%)
25pt	Not attempted **312/432 users** correct (72%)

Numbers

15pt	Not attempted **577/1925 users** correct (30%)
35pt	Not attempted **96/364 users** correct (26%)

Problem

You are given two vectors $v_1=(x_1,x_2,...,x_n)$ and $v_2=(y_1,y_2,...,y_n)$. The scalar product of these vectors is a single number, calculated as $x_1y_1+x_2y_2+...+x_ny_n$.

Suppose you are allowed to permute the coordinates of each vector as you wish. Choose two permutations such that the scalar product of your two new vectors is the smallest possible, and output that minimum scalar product.

Input

The first line of the input file contains integer number **T** - the number of test cases. For each test case, the first line contains integer number **n**. The next two lines contain **n** integers each, giving the coordinates of v_1 and v_2 respectively.

Output

For each test case, output a line

```
Case #X: Y
```

where **X** is the test case number, starting from 1, and **Y** is the minimum scalar product of all permutations of the two given vectors.

Limits

Small dataset

T = 1000
$1 \le n \le 8$
$-1000 \le x_i, y_i \le 1000$

Large dataset

T = 10
$100 \le n \le 800$
$-100000 \le x_i, y_i \le 100000$

Sample

Input	Output

Top Scores

Bohua	100
yuhch123	100
neal.wu	100
newman	100
Plagapong	100
Ahyangyi	100
Reid	100
Qingchun	100
ploh	100
kubus	100

```
2              Case #1: -25
3              Case #2: 6
1 3 -5
-2 4 1
5
1 2 3 4 5
1 0 1 0 1
```

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