Problem: MaxMin only

You are given two array A=(a1,a2,a3...an) and B=(b1,b2,b3...bn). The **Product** of these element is calculated as a1*b1+a2*b2+a3*b3+.... + an*bn.

Now your task is to choose the subsequence of elements of array A and subsequence of elements of array B (**same length and non-empty**), which Product value is Minimum.

Before the operation you are allowed to permute each **subsequence** as your wish

Input

The first line of input contains the number **T** - the number of test cases.

For each test case first line contains the number **N**.The next two lines contain **N** integers each, giving the values of array **A** and array **B** 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 required answer.

Limits

T<=20

1<=N<=100000

-100000<=a[i],b[i]<=100000

Input

2

5

-2 -3 -1 3 2

-5 -3 -2 1 2

3

1 3 -5

-2 4 1

Output

Case 1: -29

Case 2: -26