MaxMin only

You are given two array A=(a1,a2,a3...an) and B=(b1,b2,b3...bn). The Productof 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 Nintegers each, giving the values of array A and array Brespectively.

Limits

T<=20

1<=N<=100000

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

Output

For each test case, output a line,

Case X: Y

where Xis the test case number, starting from 1and Yis required answer.

Example

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