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School of Geometry

| Problem Code: **SNUG_FIT**

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Once again, we have a lot of requests from coders for a challenging problem on geometry. Geometry expert Nitin is thinking about a problem with parabolas, icosahedrons, crescents and trapezoids, but for now, to encourage beginners, he chooses to work with circles and rectangles.

You are given two sequences A_1, A_2, \dots, A_N and B_1, B_2, \dots, B_N . You should choose a permutation P_1, P_2, \dots, P_N of the integers 1 through N and construct N rectangles with dimensions $A_1 \times B_{P_1}, A_2 \times B_{P_2}, \dots, A_N \times B_{P_N}$. Then, for each of these rectangles, you should construct an inscribed circle, i.e. a circle with

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Okay

Let S be the sum of diameters of these N circles. Your task is to find the maximum value of S .

Input

- The first line of the input contains a single integer T denoting the number of test cases. The description of T test cases follows.
- The first line of each test case contains a single integer N .
- The second line contains N space-separated integers A_1, A_2, \dots, A_N .
- The third line contains N space-separated integers B_1, B_2, \dots, B_N .

Output

For each test case, print a single line containing one integer — the maximum value of S . It is guaranteed that this value is always an integer.

Constraints

- $1 \leq T \leq 50$
- $1 \leq N \leq 10^4$
- $1 \leq A_i, B_i \leq 10^9$ for each valid i

Subtasks

Subtask #1 (20 points):

- $A_1 = A_2 = \dots = A_N$
- $B_1 = B_2 = \dots = B_N$

Subtask #2 (80 points): original constraints

Example Input

```
2
4
8 8 10 12
15 20 3 5
3
20 20 20
10 10 10
```

Example Output

```
30
30
```

Explanation

Example case 1: Four rectangles with dimensions 8×3 , 8×5 , 10×20 and 12×15 lead to an optimal answer.

Author: [4★ sahi1422](#)

Editorial: https://discuss.codechef.com/problems/SNUG_FIT

Tags: [cakewalk](#), [feb20](#), [geometry](#), [greedy](#), [sahi1422](#), [tmwilliamlin](#)

Date Added: 21-01-2020

Time Limit: 1 secs

Source Limit: 50000 Bytes

Languages: C, CPP14, JAVA, PYTH, PYTH 3.6, PYPY, CS2, PAS fpc, PAS gpc, RUBY, PHP, GO, NODEJS, HASK, rust, SCALA, swift, D, PERL, FORT, WSPC, ADA, CAML, ICK, BF, ASM, CLPS, PRLG, ICON, SCM qobi, PIKE, ST, NICE, LUA, BASH, NEM, LISP sbcl, LISP clisp, SCM guile, JS, ERL, TCL, SQL, kotlin, PERL6, TEXT, SCM chicken, PYP3, CLOJ, R, COB, FS

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