

## Algorithm Class Mini-Contest 10

# Problem: TROUBLES

Time Limit: 1.0 seconds

Memory Limit: 128 MB

**Problem Description** Guangxuan has found a litter of  $N$  kittens lying around in an alley somewhere, and wants to give them up for adoption. However, kittens are trouble, they knock over your ornaments, dirty your house, etc. Luckily, Guangxuan has found out a way to measure how much trouble a group of kittens will cause.

Guangxuan first identifies each kitten with two attributes, a naughtiness level  $A_i$  and a cuteness level  $B_i$ . If he sends a particular group of cats to one owner, the trouble they will cause is given by the formula  $\max(A_i) * \max(B_i)$  over the group of kittens.

Guangxuan wants to minimise the total trouble caused by these kittens by grouping them optimally and sending them to their new owners in those groups. Help Guangxuan find out what this minimum total trouble is.

**Input Format** The first line of input contains one integer,  $N$ . The next  $N$  lines of input contain two integers each, describing  $A_i$  and  $B_i$  for each kitten.

**Output Format** The output should contain one line with one integer, the minimum trouble the kittens can cause.

**Limits** These are the bounds on the input.

Subtask	Score	Additional Bounds
1	33	$1 \leq N \leq 18$
2	34	$1 \leq N \leq 3,000$
3	33	$1 \leq N \leq 300,000$
All	-	$1 \leq A_i, B_i \leq 10^6$

### Sample Input

```
4
100 1
15 15
20 5
1 100
```

### Sample Output

500