

## B. Group Photo 2 (online mirror version)

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

Many years have passed, and  $n$  friends met at a party again. Technologies have leaped forward since the last meeting, cameras with timer appeared and now it is not obligatory for one of the friends to stand with a camera, and, thus, being absent on the photo.

Simply speaking, the process of photographing can be described as follows. Each friend occupies a rectangle of pixels on the photo: the  $i$ -th of them in a standing state occupies a  $w_i$  pixels wide and a  $h_i$  pixels high rectangle. But also, each person can lie down for the photo, and then he will occupy a  $h_i$  pixels wide and a  $w_i$  pixels high rectangle.

The total photo will have size  $W \times H$ , where  $W$  is the total width of all the people rectangles, and  $H$  is the maximum of the heights. The friends want to determine what minimum area the group photo can they obtain if no more than  $n / 2$  of them can lie on the ground (it would be strange if more than  $n / 2$  gentlemen lie on the ground together, isn't it?..)

Help them to achieve this goal.

### Input

The first line contains integer  $n$  ( $1 \leq n \leq 1000$ ) — the number of friends.

The next  $n$  lines have two integers  $w_i, h_i$  ( $1 \leq w_i, h_i \leq 1000$ ) each, representing the size of the rectangle, corresponding to the  $i$ -th friend.

### Output

Print a single integer equal to the minimum possible area of the photo containing all friends if no more than  $n / 2$  of them can lie on the ground.

### Examples

input
3 10 1 20 2 30 3
output
180

  

input
3 3 1 2 2 4 3
output
21

  

input
1 5 10
output
50