Fishy Coastline

In a small coastal country, all towns are situated on a long coastline (which we will model as a straight line). A long straight road runs along the coast, connecting the towns. The position of each town can be described by a single non-negative integer – the distance (in kilometers) from the start of the road. Most of the citizens are fishermen, and they catch great amounts of fish. After the fishing season is over and before the tourist season starts, the fish can be transported between different towns. A town can accommodate X tourists if it has X tons of fish available. The goal is to accommodate the largest possible number of tourists while distributing them evenly between towns. In other words, we want to find the largest integer Y for which it is possible to distribute fish so that each town can accommodate at least Y tourists. In one shipment, an integral number of tons of fish is sent from one town to another. During transportation, one ton of fish per kilometer traveled is lost to hungry pillagers descending from the mountains. More formally, if a town ships F tons of fish to another town that is D kilometers away, then $F - D$ tons will arrive at the destination; if F is less than D, then the entire shipment is lost. It is possible to arbitrarily repackage and combine shipments in intermediate towns. For example, we can send shipments from towns A and B to town C, combine half of the remaining fish from both shipments with the fish originating in C and send it in a single large shipment from town C to town D.

Write a program that, given the positions of all towns and the amount of fish each town produces, determines the largest number of tourists that can be accommodated by each city after the fish has been distributed.

Input

The first line of input contains an integer N, $1 \leq N \leq 100000$, the number of towns. Each of the following N lines contains two integers P and F, $0 \leq P, F \leq 1012$, the position of a town (in kilometers) and the amount of fish it produces (in tons). The towns will be sorted in ascending order of position. The positions of all towns will be distinct.

Output

The first and only line of output should contain the largest number of tourists Y from the task description.

Sample Input 1	Sample Output 1
3 1 0 2 21 4 0	6

Sample Input 2

Sample Output 2

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3
5 70
15 100
1200 20
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20
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Sample Input 3

Sample Output 3

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4
20 300
40 400
340 700
360 600
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415
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