Task AT1. WALLTOPIA

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Walltopia is a climbing wall company for entertainment. Alice and Bob went to a Walltopia climbing center near by. We can describe the wall there as a plane having N artificial rocks, where the i-th rock is located at height y_i cm. from the bottom of the wall and x_i cm. right from the center of the wall (it is possible that $x_i < 0$). There are no rocks at the same position. Every rock has a slippery rate s_i.

Alice wants to test Bob's rock climbing skills. She will choose exactly $K \geq 2$ rocks and call them special. In order to pass the test, Bob has to choose two different rocks from the special ones and be able to climb from the first to the second. When he is climbing he can use all *available* rocks (not only the special ones) to the current one. A rock, located at (x_j, y_j) and with a slippery rate s_j, is *available* from a rock, located at (x_i, y_i) and with a slippery rate s_i if and only if $y_j > y_i$ and $\max\left(|x_j - x_i|, y_j - y_i\right) \leq \max(s_i, s_j)$.

Write the program **walltopia** that finds the minimum K such that no matter what special rocks Alice chooses, Bob can always pass the test.

Input

The first line of the standard input contains the positive integer N - the number of the rocks. Each of the last N lines contains 3 integers: x_i y_i s_i describing the position and slippery rate of the corresponding rock.

Output

Output one integer - the minimum K such that Bob can always pass the test. If he can never pass it, output -1.

Constraints

- $1 \leq N \leq 500$;
- $-10^6 \leq x_i \leq 10^6$;
- $1 \leq y_i \leq 10^6$;
- $1 \leq s_i \leq 2 \times 10^6$.

Subtasks

Subtask	Points	Required subtasks	N	Other constraints
0	0	—	—	The example test.
1	9	—	≤ 20	$s_i = 2 \times 10^6$.
2	14	$0 - 1$	≤ 20	—
3	10	—	≤ 500	$x_i = 0$, all s_i are equal.
4	30	—	≤ 500	y_i is not a multiple of 3, $s_i = 1$.
5	37	$0 - 4$	≤ 500	—

The points for a subtask are given only if all tests for it and the required subtasks are passed successfully.

Example

Input	Output	Explanation
5 0 3 2 -1 5 1 4 4 3 -1 1 2 2 2 1	3	If $K = 2$ and Alice chooses the last 2 rocks as special, Bob cannot pass the test. He can try to climb from $(-1, 1)$ directly to $(2, 2)$ but it is too slippery as $\max(|2 - (-1)|, 2 - 1) = 3 \not\leq \max(2, 1) = 2$. Bob can only climb from $(-1, 1)$ to $(0, 3)$ but then he cannot climb to $(2, 2)$ as he has to always climb upwards. It can be shown that for every possible choice of 3 rocks, Bob will pass the test.