



Problem 10. Jewel Store

Time Limit : 3 second
Memory Limit : 256 megabytes

Description

Song Yong can solve any mathematical problems very very fast.

His brother, Choe Kwang, has N empty jewel stores which can save expensive jewels.

One day, Choe brings N jewels from the jewel shops.

Choe will save all the jewels to the store one per one store, i.e. he will save only one jewel in every store.

All the jewels have 4 numbers - store number p , the arrival time to the store t , and more 2 characteristic value a and b .

Let us express the jewel as (p, t, a, b) .

When the new jewel (p, t, a, b) arrived, Choe must find out the best matched jewel of the arrived jewel.

Best matched jewel (p_1, t_1, a_1, b_1) must satisfy the following conditions.

1. It must be arrived before the new jewel, i.e. $t_1 < t$.
2. Its store number must be smaller than p , i.e. $p_1 < p$.
3. "**Matching effect**" must be maximum. "**Matching effect**" is defined as
 $a_1 * a + b_1 * b$.

And Choe is willing to write the matching effect of jewels on the door of its store.

Choe instruct Song Yong to calculate and write all the numbers on the door of all stores.

Please help Song Yong.

Input

The first line contains one integer N ($1 \leq N \leq 100000$) - indicating the number of jewel stores.



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And N more lines are followed.

The p -th lines contains three integers $t a b$ - it means that this jewel is $(p t a b)$. ($1 \leq t \leq 1000000000$, $1 \leq a, b \leq 1000000$)

It is guaranteed that there are no two jewels that arrived simultaneously.

Output

Print N integers.

The p -th number is a number that was written on the p -th door.

Sample Input

```
3
1 1 1
2 2 2
3 3 3
```

Sample Output

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0
4
12
```