Problem E. LIS

Input file:	standard input
Output file:	standard output
Time limit:	7 seconds
Memory limit:	256 mebibytes

You have four sequences of integers $a_1, a_2, \ldots, a_n$; $b_1, b_2, \ldots, b_n$; $x_1, x_2, \ldots, x_n$; $y_1, y_2, \ldots, y_n$.

Let's build a directed graph, where the edge from i to j will be in the graph if $i < j$ and $a_i \cdot x_j + b_i \geq y_j$.

You need to find the longest path in this graph.

Input

The first line of input contains one integer t ($1 \leq t \leq 300\,000$): the number of test cases.

The first line of each test case contains one integer n ($1 \leq n \leq 150\,000$): the number of integers in the sequences.

Each of the next n lines contains four integers a_i, b_i, x_i, y_i ($0 \leq a_i, x_i \leq 300\,000$; $0 \leq b_i, y_i \leq 10^{11}$).

It is guaranteed that the total sum of n is at most $300\,000$.

Output

For each test case print one integer: the longest path in the described graph.

Example

standard input	standard output
3	3
3	1
1 1 1 1	1
2 2 2 2	
3 3 3 3	
3	
1 1 1 1	
2 2 2 10	
3 3 3 100	
1	
35 35 35 35	