H: Birds and Bread

Time Limit: 4 seconds

Kyle is a man who likes two things: birds and bread. He spends his Saturday afternoons feeding the ducks at his local community center's pond. He sits on a bench, rips off a piece of bread, and throws the piece of bread into the pond. As the piece of bread hits the pond, it creates a ripple in the shape of a circle that expands over the pond. While throwing pieces of bread, Kyle would like to figure out how many intersections there are between the different ripples on the pond.

Kyle models the pond as an infinite 2D plane. Each piece of bread thrown lands at integer coordinates (x, y). If a piece of bread lands at time t, its ripple starts as a single point. The ripple radiates outwards as a circle, with the radius growing at a rate of one unit per second. Therefore, at time $t + k$, the ripple has a radius of k and is centered at (x, y). If a piece of bread is thrown on a ripple, this counts as 1 intersection.

If several ripples intersect at the same point, every pair counts as a separate intersection at that point.

Input

The first line of input contains a single integer T $(1 \leq T \leq 200)$, representing the number of test cases.

The descriptions of T test cases follow. Each test case starts with a line containing two integers, n $(1 \leq n \leq 2 \cdot 10^3)$ and q $(1 \leq q \leq 10^5)$, where n is the number of pieces of bread Kyle throws and q is the number of times Kyle counts the intersections.

The next n lines each have three integers `t x y` $(0 \leq t \leq 10^9, -10^9 \leq x, y \leq 10^9)$, indicating that a piece of bread lands on the water at time t at coordinates (x, y). The times t for the pieces of bread are non-decreasing. Kyle will never throw two pieces of bread at the same location at the same time.

The next q lines each have a single integer t $(0 \leq t \leq 10^9)$, indicating that Kyle wants to count the number of intersections at time t. These times are strictly increasing.

The sum of n over all test cases will not exceed $2 \cdot 10^3$, and the sum of q over all test cases will not exceed 10^5.

Output

For each time that Kyle counts the intersections, output a line with the number of intersections at that time. It can be shown that the number of intersections is always finite.

Sample Input 1	Sample Output 1
2 3 1 0 -1 0 0 1 0 0 0 1 1 3 3 0 0 0 0 6 8 6 6 8 5 6 67	5 1 2 4