

Problem K. Taxi

Input file: **standard input**
Output file: **standard output**
Memory limit: 512 megabytes

There are n towns in Byteland, labeled by $1, 2, \dots, n$. The i -th town's location is (x_i, y_i) . Little Q got a taxi VIP card, he can use the VIP card to cut down the taxi fare. Formally, assume Little Q is at (x', y') , if he calls a taxi to drive him to the k -th town, the VIP card will reduce $\min(|x' - x_k| + |y' - y_k|, w_k)$ dollars.

Little Q wants to make full use of his VIP card. He will give you q queries, in each query you will be given his location, and you need to choose a town such that the VIP card will reduce the most taxi fare.

Input

The first line contains a single integer T ($1 \leq T \leq 100$), the number of test cases. For each test case:

The first line contains two integers n and q ($1 \leq n, q \leq 100\,000$), denoting the number of towns and the number of queries.

Each of the following n lines contains three integers x_i, y_i and w_i ($1 \leq x_i, y_i, w_i \leq 10^9$), describing a town.

Each of the following q lines contains two integers x' and y' ($1 \leq x', y' \leq 10^9$), describing a query.

It is guaranteed that the sum of all n is at most 500 000, and the sum of all q is at most 500 000.

Output

For each query, print a single line containing an integer, denoting the maximum possible reduced taxi fare.

Example

standard input	standard output
1	6
3 4	4
1 5 7	5
5 1 6	9
2 3 9	
1 5	
2 2	
4 3	
10 10	