beCP 2026

Task 2.1: Silk Road (silk-road)

Author: Petar Vitorac
Time limit: 4 s Memory limit: 64 MB

At IOI 2026 in Uzbekistan, the members of the Belgian team are planning a small expedition along part of the historic Silk Road. For centuries, merchants traveled across Central Asia with caravans carrying valuable goods. Along these routes, travelers stopped at roadside inns called caravanserais, where they could rest and replenish supplies before continuing their journey across the desert.

Your expedition starts in Samarkand, which we consider to be at distance 0. Along the road there are N caravanserais. The i-th caravanserai ($0 \leq i < N$) is located D_i kilometers from Samarkand. Traveling through the desert requires water. The expedition carries waterskins, where each waterskin contains enough water to travel 1 kilometer. Therefore, walking 1 kilometer consumes exactly one waterskin. When the expedition reaches caravanserai i, it can obtain W_i additional waterskins.

As they plan their journey, the members of the team are considering Q possible end destinations along the route. For each of the candidate end caravanserai E_j ($0 \leq j < Q$), determine the minimum number of waterskins the expedition must carry when departing from Samarkand so that they can reach that caravanserai without the number of waterskins ever becoming negative during the trip.

Input

The first line contains two integers N and Q.

The next N lines each contain two integers D_i and W_i, describing a caravanserai:

- D_i: its distance from Samarkand in kilometers,
- W_i: the number of waterskins that can be obtained there.

The caravanserais are given in strictly increasing order of distance, that is $\forall i \in [0, N-2] : D_i < D_{i+1}$.

The next Q lines each contain one integer E_j ($0 \leq j < Q$), indicating a caravanserai that the team might choose as their end destination.

Output

For each candidate end destination, output a single line containing one integer: the minimum number of waterskins required at the start.

NOTE: Certain values may be too big to fit in a normal `int` datatype, so make sure to use `long long` where appropriate.

General limits

- $1 \leq N \leq 1\ 000\ 000$
- $1 \leq Q \leq 1\ 000\ 000$
- $1 \leq D_i \leq 10^9$
- $0 \leq W_i \leq 10^9$
- $\sum_{i=0}^{N-1} W_i \leq 10^9$, i.e. the total amount of caravanserais that can be obtained does not exceed 10^9
- $\forall i \in [0, N-2] : D_i < D_{i+1}$, i.e. caravanserais are given in strictly increasing order of distance in the input
- $\forall j \in [0, Q-1] : 0 \leq E_j < N$

Additional constraints

Subtask	Points	Constraints
A	17	$N = 2$
B	15	$Q = 1$
C	13	$\forall i \in [0, N-1] : W_i = 0$, i.e. you cannot get water at any caravanserais
D	16	$N, Q \leq 5000$
E	39	No additional constraint

Example 1

sample1.in

```
7 7
3 0
5 4
8 0
10 3
15 1
20 10
25 0
0
1
2
3
4
5
6
```

sample1.out

```
3
5
5
6
8
12
12
```