Drive

HackerRank

HackerRank is starting a bus service in MountainView, California. The bus starts at time T = 0 at $station_1$ and goes through $station_2$, $station_3$, $station_4$ in that order and reaches the headquarters located at $station_n$. At every station, the bus waits for various commuters to arrive before it departs to the next station. Ignoring the acceleration, the bus moves at 1 meter / second. i.e., if $station_i$ and $station_j$ are 1000 meters apart, the bus takes 1000 seconds to travel from $station_i$ to $station_j$.

The bus is equipped with **K** units of Nitro (N_2O). If going from $station_i$ to $station_j$ takes x seconds, then using t units of nitro can decrease the time taken to max(x-t, 0) seconds where max(a,b) denotes the greater of the two values between a & b. The Nitro can be used all at once or in multiples of 1 unit.

If the bus driver travels optimally, what is the minimum sum of travelling time for all commuters? The travelling time equals to the time he/she arrived at the destination minus the time he/she arrived the start station.

Please remember that the driver must take all passengers to their destination.

Input Format

The first line contains 3 space separated integers n, m and K which indicate the number of stations, total number of people who board the bus at various stations and the total units of Nitro (N_2O) present in the bus.

The second line contains n-1 space separated integers where the i^{th} integer indicates the distance between $station_{(i-1)}$ to $station_i$.

m lines follow each containing 3 space separated integers. The i^{th} line contains t_i, s_i and e_i in that order indicating the arrival time of the commuter at s_i at time t_i with his destination being e_i.

```
n m K
d1 d2 ... dn-1   // di: the distance between station_i to station_(i+1).
t1 s1 e1         // commuter 1 arrives at his boarding point at s1 and his destination is e1
t2 s2 e2
...
tm sm em
```

Constraints

$0 < n <= 100000$
$0 < m <= 100000$
$0 <= K <= 10000000$
$0 < d_i <= 100$
$0 <= t_i <= 10000000$
$1 <= s_i < e_i <= n$

Output Format

The minimal total travel time.

Sample Input

```
3 3 2
1 4
1 1 3
2 1 2
5 2 3
```

Sample Output

```
9
```

Explanation

The bus waits for the 1^{st} and the 2^{nd} commuter to arrive at $station_1$ and travels to $station_2$ carrying 2 passengers. The travel time from $station_1$ to $station_2$ is 1 second. It then waits for the 3^{rd} commuter to board the bus at time = 5, 2^{nd} commuter deboards the bus. The 3^{rd} commuter boards the bus at t = 5. The bus now uses 2 units of nitro, this reduces the commute time to travel to $station_3$ from 4 to 2.

Hence, the total time spent by each of the passengers on the bus is

1. 1 (time spent waiting for commuter 2) + 1 (travel time from $station_1$ to $station_2$) + 2 (time spent waiting for commuter 3) + 2 (travel time from $station_2$ to $station_3$) = 6
2. 1 (travel time from $station_1$ to $station_2$)
3. 2 (travel time from $station_2$ to $station_3$)

   6+1+2 = 9

hence the answer.

Timelimits

Timelimits for this challenge can be seen here