OJ4

A Postman

Description

Lida Pu is a postman from Twilight Company. There are N houses along a long straight street, and it takes d_i seconds for Lida Pu to walk from the i^{th} to the $(i+1)^{th}$ house. Lida Pu begins his work at the first house at time 0 everyday, singing songs while walking down the street, and finishes his work at the last house.

Lida Pu is in charge of M letters: the i^{th} letter which should be sent to house b_i would appear at house a_i at time t_i punctually ($a_i < b_i$). As a responsible postman, Lida Pu would not miss any letters, so he would not leave certain house until all letters from it appears. Also, as an experienced postman, Lida Pu collects and sends letters within no time.

However, one day Lida Pu is accused of noise making. Thus he is required to run instead of walking and singing. Yet he could run K times at most. When Lida Pu runs from the i^{th} house, he could reduce the original d_i by 1. Note that Lida Pu could run from the same house multiple times, but $0 \le d_i$ should be satisfied at all times.

Suppose Lida Pu arrives at the i^{th} house at time x_i, then the waiting time of the j^{th} letter is $w_j = x_{b_j} - t_j$. Now Lida Pu wants to minimize $f = \sum_{j=1}^{M} w_j$. Please calculate it for him.

Input format

The first line contains three integers N, M, K.

The second line contains $N-1$ integers $d_1, d_2, \ldots, d_{N-1}$.

The next M lines each contain three integers: a_i, b_i, t_i.

Output format

Output one integer indicating the minimum f.

Samples

Sample Input

```
5 4 2
3 2 1 6
1 3 2
4 5 6
2 5 10
2 3 6
```

Sample Output

```
30
```

B Server

Description

N servers are scattered on a 2D plane. The coordinate of the i^{th} server is (x_i, y_i). No two servers share the same coordinate.

The famous engineer, **RHC**, wants all N servers to be connected. Initially, there are no link among these servers. **RHC** can create as many undirected links as he wants between any pair of servers. If any two servers can reach to each other by these links, the N servers are said to be connected.

However, if two servers connected by a link are too close to each other, interference will occur. Therefore, if the **Manhattan Distance** of two servers is less than some constant D, **RHC** will refuse to link them.

With greater D comes greater performance. However, he still needs to guarantee their connectivity. Help **RHC** find the maximal D.

Input format

The first line contains an integer N.

For the following N lines, the i^{th} line contains two integers x_i, y_i.

Output format

Output the maximal D.

Samples

Sample 1 Input

```
5
-2 -3
-2 0
2 -1
2 0
3 0
```

Sample 1 Output

```
5
```

Limitations & Hints

Hints

1. **Manhattan Distance** of (x_1, y_1) and (x_2, y_2) is defined as $|x_1 - x_2| + |y_1 - y_2|$.
2. **Chebyshev Distance** of (x_1, y_1) and (x_2, y_2) is defined as $\max(|x_1 - x_2|, |y_1 - y_2|)$.
3. Let $x' = x + y,\ y' = x - y$. Then the Manhattan distance of (x_1, y_1) and (x_2, y_2) equals to the Chebyshev distance of (x'_1, y'_1) and (x'_2, y'_2). This information should be enough for you to solve this problem. For further study however, you can refer to this tutorial, especially the conclusion.

Limitations

For 70% testcases:

- $N \leq 1000$

For 100% testcases:

- $2 \leq N \leq 2 \times 10^5$
- $|x_i|, |y_i| \leq 10^8$