



# Maximizing Mission Points

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Problem

Submissions

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Xander Cage has a list of cities he can visit on his new top-secret mission. He represents each city as a tuple of  $(latitude, longitude, height, points)$ . The values of *latitude*, *longitude*, and *height* are distinct across all cities.

We define a mission as a sequence of cities,  $c_1, c_2, c_3, \dots, c_k$ , that he visits. We define the total *points* of such a mission to be the sum of the *points* of all the cities in his mission list.

Being eccentric, he abides by the following rules on any mission:

- He can choose the number of cities he will visit (if any).
- He can start the mission from any city.
- He visits cities in order of strictly increasing *height*.
- The absolute difference in *latitude* between adjacent visited cities in his mission must be *at most*  $d_{lat}$ .
- The absolute difference in *longitude* between adjacent visited cities in his mission must be *at most*  $d_{long}$ .

Given  $d_{lat}$ ,  $d_{long}$ , and the definitions for  $n$  cities, find and print the maximum possible total *points* that Xander can earn on a mission.

## Input Format

The first line contains three space-separated integers describing the respective values of  $n$ ,  $d_{lat}$ , and  $d_{long}$ .

Each line  $i$  of the  $n$  subsequent lines contains four space-separated integers denoting the respective *latitude*, *longitude*, *height*, and *points* for a city.

## Constraints

- $1 \leq n \leq 2 \times 10^5$
- $1 \leq d_{lat}, d_{long} \leq 2 \times 10^5$
- $1 \leq latitude, longitude, height \leq 2 \times 10^5$
- $-2 \times 10^5 \leq points \leq 2 \times 10^5$

## Output Format

Print a single integer denoting the maximum possible *points* that Xander can earn on a mission.

## Sample Input 0

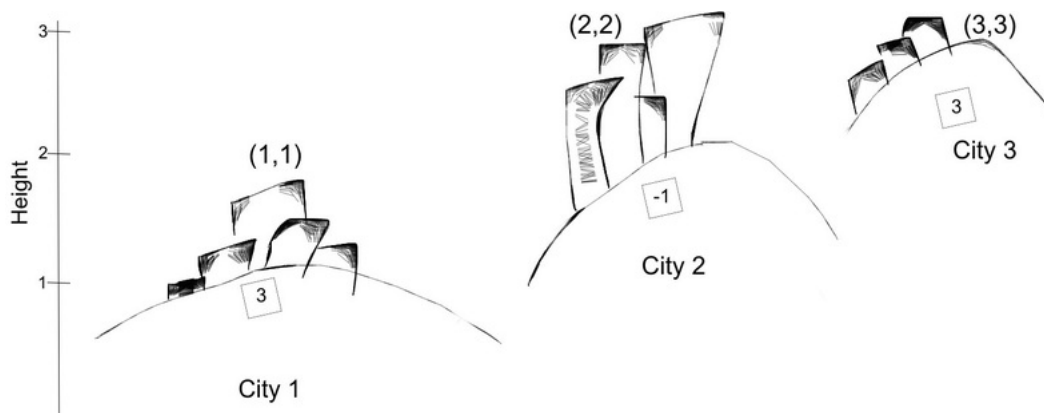
```
3 1 1
1 1 1 3
2 2 2 -1
3 3 3 3
```

## Sample Output 0

5

## Explanation 0

Xander can start at city **1**, then go to city **2**, and then go to city **3** for a maximum value of total *points* =  $3 + -1 + 3 = 5$



Note that he cannot go directly from city **1** to city **3** as that would violate his rules that the absolute difference in *latitude* between adjacent visited cities be  $\leq d_{lat}$  and the absolute difference in *longitude* between adjacent visited cities be  $\leq d_{long}$ . Because  $d_{lat} = 1$  and  $d_{long} = 1$ , he cannot directly travel between those cities.

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Submissions: [242](#)

Max Score: 70

Difficulty: Hard

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Current Buffer (saved locally, editable)

Java 7



```

1 import java.io.*;
2 import java.util.*;
3 import java.text.*;
4 import java.math.*;
5 import java.util.regex.*;
6
7 public class Solution {
8
9     public static void main(String[] args) {
10         Scanner in = new Scanner(System.in);
11         int n = in.nextInt();
12         int d_lat = in.nextInt();
13         int d_long = in.nextInt();
14         for(int a0 = 0; a0 < n; a0++){
15             int latitude = in.nextInt();
16             int longitude = in.nextInt();
17             int height = in.nextInt();
18             int points = in.nextInt();
19             // Write Your Code Here
20         }
21         in.close();
22     }
23 }
24

```

Line: 1 Col: 1

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