Music on the Street

locked

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Problem Submissions Leaderboard Discussions Editorial

Submissions will no longer be placed on the leaderboard. You may still attempt this problem for practice.

There is a big music festival happening on Main street in Bytetown! We can consider this street to be along an infinite number line where, at every point on the line, some genre of music playing. More precisely, there are n points, $a_0, a_1, \ldots, a_{n-1}$, which are *borders* between different genres of music. So, at every point from $-\infty$ to a_0, the first genre of music is playing (say, Techno). At every point from a_0 to a_1, the second genre of music is playing (say, Disco). This continues until the last genre of music (say, House), which is playing from a_{n-1} to $+\infty$. All coordinates are given in miles.

Conor wants to visit this event. He plans to walk exactly m miles at a constant speed of 1 mile per hour in the positive direction. For each genre of music he passes, he wants to listen to it for a minimum of h_{min} hours (to determine whether he likes it or not) and a a maximum of h_{max} hours (so he will not get bored).

Given n integers denoting the respective border points for each music genre and the values of m, h_{min}, and h_{max}, find and print an integer denoting the optimal location for Conor to start his walk through the festival such that all of his above requirements are satisfied.

Input Format

The first line contains a single integer, n, denoting the number of border points.
The second line contains n distinct space-separated integers describing the respective values of $a_0, a_1, \ldots, a_{n-1}$.
The third line contains three space-separated integers describing the respective values of m, h_{min}, and h_{max}.

Constraints

- $1 \leq n \leq 10^6$
- $|a_i| \leq 10^9$, all a_i are pairwise different and given in *increasing* order.

- $1 \leq h_{min} \leq h_{max} \leq 10^9$
- $1 \leq m \leq 10^9$
- It's guaranteed that at least one solution exists.

Output Format

Print a single integer denoting the possible start point for Conor's walk. If there are several solutions, print any one of them.

Sample Input 0

```
2
1 3
7 2 3
```

Sample Output 0

```
-2
```

Explanation 0

If Conor starts at point -2, he will hear music in segment $[-2, 1]$ for 3 hours, segment $[1, 3]$ for 2 hours, and segment $[3, 5]$ for his last 2 hours. Similarly, he could start walking at -1 and still satisfy all of his conditions.

Line: 1 Col: 1

Upload Code as File

Test against custom input

Run Code

Submit Code