

Problem D

Devious Plan

Problem ID: devious
Time limit: 2 seconds

Ridho is travelling to India, and he wants to make his journey as cheap as possible. So, he is flying on the world's cheapest air line: Bengal Tiger Air Lines. Bengal Tiger Air Lines has the cheapest ticket prices, but they are notorious for charging massive fees for everything else including meals and check-in luggage.

To save the maximum amount, Ridho is determined to not pay for check-in luggage. He therefore has a devious plan: he is going *wear* as many of his shirts as he can!

But Ridho has a problem: his local airport has a very complicated series of security checkpoints. If he wears too many shirts, he may become too wide to fit through all the checkpoints.

Ridho has asked you to write a program to help him determine the maximum number of shirts he can wear. Can you help him?

In two dimensions, Ridho can be described as a circle with radius R when he is shirtless. He has N shirts, the i^{th} of which has some thickness t_i . Wearing the i^{th} shirt would increase Ridho's radius by t_i . The airport terminal can be described as a rectangular hallway, filled with circular obstacles. The terminal has length L in the East-West direction, and width W in the North-South direction.

Ridho has to walk from the Western end of the hallway to the Eastern end without getting stuck, so he must not touch either of the Northern or Southern walls, nor any of the obstacles. He can choose any starting point at the Western end, and any endpoint at the Eastern end.

What is the maximum number of shirts Ridho can wear through airport security?

Input

The first line of input contains two space-separated integers R ($1 \leq R \leq 1000$) and N ($1 \leq N \leq 10^4$), Ridho's shirtless radius and the number of shirts that Ridho has, respectively.

The second line contains N space-separated integers, the i^{th} of which, t_i , is the thickness of Ridho's i^{th} shirt ($0 < t_i \leq 100$).

The third line contains three space-separated integers L ($1 \leq L \leq 10^4$), W ($1 \leq W \leq 10^4$), and M ($0 \leq M \leq 2000$): the length of the airport terminal, the width of the airport terminal, and the number of obstacles, respectively.

The next M lines describe the obstacles. The i^{th} line contains three space-separated integers x_i ($0 \leq x_i \leq L$), y_i ($0 \leq y_i \leq W$), and r_i ($0 < r_i \leq 10^4$) indicating that the i^{th} obstacle is a circle of radius r_i centered at position (x_i, y_i) (x_i from the Western wall, and y_i from the Southern wall).



Output

Display the maximum number of shirts Ridho can wear, between 0 and N , inclusive. Display -1 if it is not possible.

Sample Input 1

```
200 1
10
10000 10000 0
```

Sample Output 1

```
1
```

Sample Input 2

```
200 10
5 5 5 5 5 5 5 5 5 5
10000 450 0
```

Sample Output 2

```
4
```

Sample Input 3

```
50 10
1 2 3 4 5 6 7 8 9 10
10000 500 1
5000 250 100
```

Sample Output 3

```
6
```

Sample Input 4

```
100 3
1 2 3
10000 200 0
```

Sample Output 4

```
-1
```