

Dot Game Dominator

Filename: *dot*

Time Limit: 8 *seconds*

A few years ago there was a popular game called agar.io, where you controlled a dot and if your dot touched a smaller dot, your dot ate that dot and consequently grew bigger. In particular, if your area is A and the other dot's area is B ($B < A$), then after you touch the other dot, it disappears and your dot's area would be $A + B$. Of course, if a bigger dot (or a dot of equal size) touched your dot, you would die!

If you are the strictly biggest dot in the whole arena, then it's guaranteed that you'll win, since no one can eat you!

In this version of the problem, we'll assume that none of the other dots eat each other and that you have exquisite skill and can eat whichever dots are smaller than you while avoiding all of the dots that are larger than you. Naturally, your goal is for your dot to become the biggest dot.

Since you have many other games you'd like to play, you'd like to accomplish your goal by eating as few other dots as possible.

The Problem

Given the initial area of your dot, as well as the areas of all of the other dots in the game, determine the fewest number of dots you need to eat to become the biggest. If this isn't possible, indicate that this is the case.

The Input

The first line of input will consist of a single positive integer, c ($c \leq 25$), representing the number of input cases to process. Each input case begins with a line with 2 positive integers, s ($s \leq 10^3$), and n ($n \leq 10^5$), representing the initial size of your dot and the number of other dots, respectively. The following n lines will contain 1 positive integer each, representing the size of one of the other dots. It is guaranteed that each of these is in between 1 and 10^9 .

The Output

For each input case, on a line by itself, output the fewest number of dots your dot needs to eat to become the largest dot (no ties). If this isn't possible, output -1.

Sample Input

```
2
5 3
2
6
8
10 2
5
100
```

Sample Output

```
2
-1
```