Google Code Jam '10 Qualification Round Problem C - Theme Park

Time limit: 30.0s **Memory limit:** 1G

Roller coasters are so much fun! It seems like everybody who visits the theme park wants to ride the roller coaster. Some people go alone; other people go in groups, and don't want to board the roller coaster unless they can all go together. And *everyone* who rides the roller coaster wants to ride again. A ride costs 1 Euro per person; your job is to figure out how much money the roller coaster will make today.

The roller coaster can hold k people at once. People queue for it in groups. Groups board the roller coaster, one at a time, until there are no more groups left or there is no room for the next group; then the roller coaster goes, whether it's full or not. Once the ride is over, all of its passengers re-queue in the same order. The roller coaster will run R times in a day.

For example, suppose $R = 4$, $k = 6$, and there are four groups of people with sizes: 1, 4, 2, 1. The first time the roller coaster goes, the first two groups [1, 4] will ride, leaving an empty seat (the group of 2 won't fit, and the group of 1 can't go ahead of them). Then they'll go to the back of the queue, which now looks like 2, 1, 1, 4. The second time, the coaster will hold 4 people: [2, 1, 1]. Now the queue looks like 4, 2, 1, 1. The third time, it will hold 6 people: [4, 2]. Now the queue looks like [1, 1, 4, 2]. Finally, it will hold 6 people: [1, 1, 4]. The roller coaster has made a total of 21 Euros!

Input Specification

The first line of the input gives the number of test cases, T. T test cases follow, with each test case consisting of two lines. The first line contains three space-separated integers: R, k and N. The second line contains N space-separated integers g_i, each of which is the size of a group that wants to ride. g_0 is the size of the first group, g_1 is the size of the second group, etc.

Output Specification

For each test case, output one line containing `Case #x: y`, where x is the case number (starting from 1) and y is the number of Euros made by the roller coaster.

Limits

Time limit: 30 seconds per test set.

Memory limit: 1GB.

$1 \leq T \leq 50$.

$g_i \leq k$.

Small dataset

$1 \leq R \leq 1\,000$.

$1 \leq k \leq 100$.

$1 \leq N \leq 10$.

$1 \leq g_i \leq 10$.

Large dataset

$1 \leq R \leq 10^8$.

$1 \leq k \leq 10^9$.

$1 \leq N \leq 1\,000$.

$1 \leq g_i \leq 10^7$.

Sample Input

```
3
4 6 4
1 4 2 1
100 10 1
1
5 5 10
2 4 2 3 4 2 1 2 1 3
```

Sample Output

```
Case #1: 21
Case #2: 100
Case #3: 20
```