

Question 2: Bin Packing

You are given N metal objects, each weighing between 0 and K . You want to pack these objects into some containers of capacity K . You have an infinite number of containers, but would want to use least of them.

You use the following greedy algorithm to insert objects:

Consider objects **in the order** in which they are given to you.

Insert the object under consideration into that container which has enough space for it and has minimum space left after insertion of the object. If none of the available containers has enough space to insert the object, then you use a new bin for inserting the object in consideration.

You have to output the number of bins used in such an approach.

Expected **average-case** runtime is $O(N \log N)$.

Input format

First line contains T , the number of test cases.

First line of every test case contains space separated integers N and K .

Next line contains N space-separated integers, the weights of the N objects.

Output format

Print 1 integer, the number of containers used by the given algorithm.

Constraints

$$1 \leq T \leq 100$$

$$1 \leq N \leq 10^5$$

$$1 \leq K \leq 10^9$$

$$0 \leq W_i \leq K, \text{ where } W_i \text{ represents the weight of } i^{\text{th}} \text{ bin.}$$

Sample Input

```
2
10 5
3 3 3 2 2 2 1 1 1 2
3 3
2 2 2
```

Sample Output

```
4
3
```

Time Limit: 1 second