

Toffee Boxes

Problem Code: **MINMAXTF**



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You have **N** toffee packets, each containing different number of toffees. The number of toffees contained in the *i*th packet is denoted by **c_i**. You need to put these toffee packets in **M** boxes such that each box contains at least one toffee packet, and the maximum number of toffees in a box is minimum.

You can only choose consecutive toffee packets to put in a box.

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Input

The first line of the input contains an integer **T** denoting the number of test cases. The first line of each test case contains two space separated integers **N**, **M** denoting the number of toffee packets and the number of boxes respectively. The second line of each test case contains **N** space separated integers **c₁**, **c₂**, ..., **c_N** where **c_i** denotes the number of the toffees in the *i*th toffee packet.

Output

For each test case, output a single line containing the maximum number of toffees in a box. Also, output **-1** if such an assignment of toffee packets to boxes is not possible.

Constraints

- $1 \leq T \leq 20$
- $1 \leq N, K \leq 100000$
- $1 \leq c_i \leq 1000$

Example

Input :

```
1
4 2
10 3 5 7
```

Output :

```
13
```

Explanation

Below are the possible assignments of toffee packets to boxes.

1. 10 [3 5 7]
2. 10 3 [5 7]
3. 10 3 5 [7]

For minimizing the maximum number of toffees in a box, we choose the second assignment, and hence the output should be 13

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