Problem D. Qenerals

Input file: `standard input`
Output file: `standard output`

Yuki is playing a game called Qenerals.

At time $t = 0$, Yuki has $x = 0$ soldiers and occupies $y = 1$ fortress. There are n unoccupied fortresses on the map, where the i-th fortress has a parameter a_i.

The game lasts for m seconds. For each positive integer i such that $1 \le i \le m$:

- At the beginning of the i-th second, each fortress occupied by Yuki produces 1 soldier, i.e., $x \leftarrow x+y$.
- At the end of the i-th second, Yuki can perform any number of operations (including zero). In each operation, Yuki chooses an unoccupied fortress j such that $a_j \le x$, consumes a_j soldiers, and occupies fortress j, i.e., $x \leftarrow x - a_j$ and $y \leftarrow y + 1$.

You need to help Yuki determine the maximum number of soldiers she can have after the game ends.

Input

This problem contains multiple test cases.

The first line contains a positive integer t ($1 \le t \le 10^5$), representing the number of test cases.

For each test case:

- The first line contains two positive integers n, m ($1 \le n \le 5 \cdot 10^5,\ 1 \le m \le 10^9$).
- The second line contains n positive integers $a_1, \ldots, a_n$ ($1 \le a_i \le 10^9$).

It is guaranteed that the sum of n over all test cases does not exceed $5 \cdot 10^5$.

Output

For each test case, output a single line containing an integer representing the maximum number of soldiers Yuki can have after the game ends.

Example

standard input	standard output
3 2 3 2 1 3 6 1 1 3 3 5 1 1 1	4 13 12

Note

For the first test case:

- At the beginning of the 1-st second, the number of fortresses occupied by Yuki is $y = 1$, so the number of soldiers x increases from 0 to 1.
- At the end of the 1-st second, Yuki can choose to occupy the 2-nd fortress, so y increases from 1 to 2, and x decreases from 1 to 0.

- At the beginning of the 2-nd second, $y = 2$, so x increases from 0 to 2.
- At the end of the 2-nd second, Yuki can choose not to perform any operations.
- At the beginning of the 3-rd second, $y = 2$, so x increases from 2 to 4.
- At the end of the 3-rd second, Yuki can choose not to perform any operations.
- After the game ends, the number of soldiers x is 4. It can be proven that 4 is the maximum number of soldiers Yuki can have.

For the second test case:

- Yuki can occupy the 1-st, 2-nd, and 3-rd fortresses at the end of the 1-st, 2-nd, and 3-rd seconds respectively, allowing her to have 13 soldiers after the game ends.

For the third test case:

- Yuki can occupy the 1-st fortress at the end of the 1-st second, and the 2-nd and 3-rd fortresses at the end of the 2-nd second, allowing her to have 12 soldiers after the game ends.