

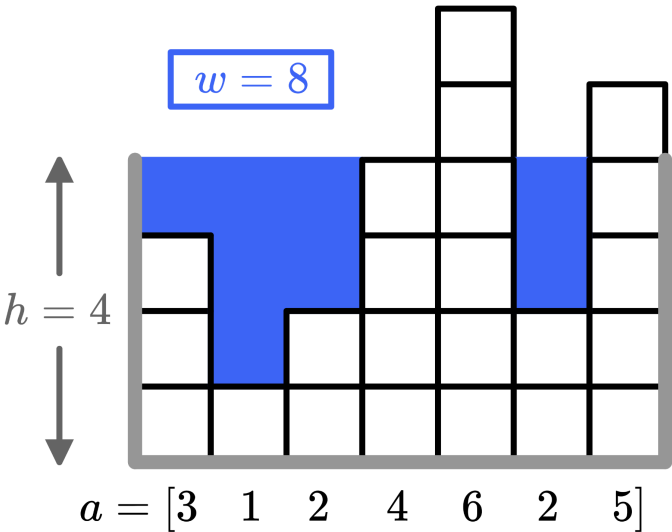
E. Building an Aquarium

time limit per test: 2 seconds
memory limit per test: 256 megabytes

You love fish, that's why you have decided to build an aquarium. You have a piece of coral made of n columns, the i -th of which is a_i units tall. Afterwards, you will build a tank around the coral as follows:

- Pick an integer $h \geq 1$ — the *height* of the tank. Build walls of height h on either side of the tank.
- Then, fill the tank up with water so that the height of each column is h , unless the coral is taller than h ; then no water should be added to this column.

For example, with $a = [3, 1, 2, 4, 6, 2, 5]$ and a height of $h = 4$, you will end up using a total of $w = 8$ units of water, as shown.



You can use at most x units of water to fill up the tank, but you want to build the biggest tank possible. What is the largest value of h you can select?

Input

The first line contains a single integer t ($1 \leq t \leq 10^4$) — the number of test cases.

The first line of each test case contains two positive integers n and x ($1 \leq n \leq 2 \cdot 10^5$; $1 \leq x \leq 10^9$) — the number of columns of the coral and the maximum amount of water you can use.

The second line of each test case contains n space-separated integers a_i ($1 \leq a_i \leq 10^9$) — the heights of the coral.

The sum of n over all test cases doesn't exceed $2 \cdot 10^5$.

Output

For each test case, output a single positive integer h ($h \geq 1$) — the maximum height the tank can have, so you need at most x units of water to fill up the tank.

We have a proof that under these constraints, such a value of h always exists.

Example

input	Copy
5 7 9 3 1 2 4 6 2 5 3 10 1 1 1 4 1 1 4 3 4 6 1984 2 6 5 9 1 8 1 100000000 1	
output	Copy
4 4 2 335 100000001	

Note

The first test case is pictured in the statement. With $h = 4$ we need 8 units of water, but if h is increased to 5 we need 13 units of water, which is more than $x = 9$. So $h = 4$ is optimal.

In the second test case, we can pick $h = 4$ and add 3 units to each column, using a total of 9 units of water. It can be shown that this is optimal.

In the third test case, we can pick $h = 2$ and use all of our water, so it is optimal.

Codeforces Round 898 (Div. 4)

Finished

Practice

Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

Submit?

Language: GNU G++20 13.2 (64 bit, win)

Choose file: Choose File No file chosen

Submit

Submission	Time	Verdict
224441138	Sep/21/2023 18:55	Accepted
224436872	Sep/21/2023 18:51	Wrong answer on test 3

Problem tags

binary search sortings *1100

No tag edit access

Contest materials

Announcement (en)

Tutorial (en)