
Problem A. New protocol

Input file: `input.txt`
Output file: `output.txt`
Time limit: 2 seconds
Memory limit: 256 megabytes

While Simon vaguely presented his idea about increasing average IQ of the firm departments, Chris was thinking. If somebody needed to just sell a big batch of counting devices, it would be enough to make a “local accident”. It is possible that Simon wants to dominate the World, but his patrons could have more modest plans.

— You know, Simon, I think I have an interesting suggestion about the counting devices. I talked with my cell... roommates. It is possible to make it easier. Instead of new counters we could make a small device which could encrypt the traffic for safety. Of course, it won't encrypt anything. It will transfer the data in a different manner. The consumers will be happy — there is no need to change the counter, you can just buy a small box.

Simon stared at Chris from a large screen. His stare was suspicious and there was that glitter that occurred when he thought that he will not miss chance. He liked the idea, but he tried to figure out quickly if there was a catch.

Several minutes later, Chris was sitting in a chair in Simon's office and drew a scheme, describing it at the same time. Assume that first 4 bytes — data, next 4 bytes — the amount of consumed electricity, next 4 bytes — the amount of cold water... The counter gives the information in that particular order. But the program, which processes the data, could need another order of bytes to interpret them correctly. Of course, there is nothing complicated in rearranging the bytes in program itself. But there is another way...

Simon thinks that an employee with a special key is essential to reprogram the device. However, there is a problem in that case: you cannot upgrade the system to a new protocol version at once.

There are N technicians in the service company. Each of them services his own region. However, for various reasons, technicians work at different speeds, and therefore each of them requires a different number of days to visit all of the house owners and to reprogram the devices. It is known that during the day, each technician visits at least one homeowner.

Technicians work very hard. When a technician reprograms all devices in his region so that they support protocol version V he doesn't rest. No, the next day he goes back to his region to reprogram the devices so that they support protocol version $V + 1$.

There is a contract with the service company for M work days. Initially, all devices are programmed equally and support protocol version 0.

Your task is to determine the maximal number of protocol versions that are needed to be supported at the same time for data processing.

Input

The first line contains two integers N and M ($2 \leq N \leq 10^5$, $2 \leq M \leq 10^5$) — amount of technicians in company and the number of work days according to the contract.

The second line contains N integer numbers D_1, D_2, \dots, D_N , where D_j ($1 \leq D_j \leq 10^5$, $j = 1, 2, \dots, N$) — the number of days it takes the technician j to fully service his region.

Output

Output on the first line the maximal possible number of protocol versions that are needed to be supported at the same time for data processing.

Examples

input.txt	output.txt
2 30 1 7	3
2 22 3 5	4
5 42 7 2 8 4 2	7

Note

In the first example the number of protocol versions, which are needed to be supported during the stated amount of days, will vary from 2 to 3.

The first technician changed the protocols on all devices in his region during the first day. Thus, at the end of the first day only protocol version 1 will be actual.

The second technician managed to service only part of his region, so now there are protocol versions 0 and 1 that are actual.

So, as one can see, it is sufficient to support only two different protocol versions on the first day.

On the second day the first technician will service his region another time and will upgrade the protocol version to 2 on all devices. The second technician will continue to service his region. There will still be two actual protocol versions 0 and 1, which means that on the second day support for all three protocol versions at the same time is needed.

On the third day it will be necessary to support three protocol versions again, but the versions will be 0, 1 and 3.

Note that on the seventh day it will only be necessary to support two protocol versions: 1 and 7 (because the second technician will finish to service his region).

In the second example, the maximal number of protocol versions that are needed to be supported at the same time will be achieved, for example, on the 13th day.