



Problem H

Arrangement for Contests

As a sponsor of programming contests, Yu has many circumstances should be considered. Recently, he has found that the difficulties of problems can be a serious factor.

For novices, they may simply ignore the problems that are too hard, and for experts in programming contests, an easy problem almost means nothing. Moreover, if a contest consists of both easy and hard questions, it will not satisfy them – but make them unhappy for both reasons.

Therefore, Yu has come up with an idea. To hold different kinds of contests! Novices tend to participant in a contest known as an easy one, but will not join a hard one.

In details, suppose the difficulty of a problem can be measured by a positive integer i . A bigger number means that the problem is harder. In Yu's design, problems of a contest should have consecutive difficulties. Formally speaking, if a contest has k problems, their difficulties must be $i, i+1, \dots, i+k-2$ and $i+k-1$ respectively. It is because if there are two problems with the same difficulty, their functions in the contest will be the same, and that is not good, and if two problems have a big gap in difficulties, some questions mentioned above will appear.

Therefore, a contest with difficulties 1, 2, 3, 4, 5 is obviously a simple one, and a contest with 5, 6, 7, 8, 9 is a hard one.

Yu has a large amount of problems, and he measures all the difficulties. Now, he wants to hold as many contests as possible, each of which contains exactly k problems with a given integer k . Please help him to count the maximum number of contests which can be held.

Input

The first line of the input contains an integer T ($1 \leq T \leq 10$), which is the number of test cases. Then T test cases follow and each test case consists of two lines.

The first line contains two integers n and k ($1 \leq k \leq n \leq 100000$), where n means the kinds of difficulties, and k is the number of questions that a contest should have. The second line contains n integers, the i -th one of which is an integer $a[i]$ ($0 \leq a[i] \leq 10^9$) indicating the number of problems whose difficulties are i .

Output

For each test case, the output should be a single integer in a line indicating the maximum number of contests which Yu can hold.

Sample Input

Sample Output

| | |
|----------------------------------|------------|
| 4 | 2 |
| 3 2 | 5 |
| 1 2 1 | 6 |
| 6 3 | 1000000000 |
| 1 5 3 4 7 6 | |
| 9 4 | |
| 2 7 1 3 6 5 8 9 4 | |
| 3 3 | |
| 1000000000 1000000000 1000000000 | |