Barkley II

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

Prof.Hui is the coach of Pigeland University Programming Team. There are n students in his team. All algorithms are numbered by Prof.Hui in ascending order of difficulty, from 1 to m. Which means that algorithm 1 is the easiest algorithm, while algorithm m is the hardest. The i-th student masters the a_i-th easiest algorithm.

Now Prof.Hui wants to choose a team satisfying the following conditions:

- The index of the students in the team forms an interval. Which means that there exists two integers l, r such that $1 \le l \le r \le n$ and student x is in the team if and only if $l \le x \le r$.
- The rating of the team is maximized. The more algorithms the team mastered, the stronger they are, but if they cannot solve a hard problem in one contest, they will feel more disappointed. So the rating of the team is the number of **different** algorithms that the students in the team mastered minus the index of the **easiest** algorithm that no one in the team mastered. If the students in the team masters all the algorithms, the index of the **easiest** algorithm that no student in the team mastered is considered to be $m + 1$. For example, if $m = 5$ and there are 6 students in the team, mastering algorithm $2, 5, 4, 4, 1, 1$ respectively, the rating of the team is $4 - 3 = 1$.

Please help Prof.Hui to find the maximum rating of a team.

Input

The first line contains an integer t ($1 \le t \le 5 \cdot 10^5$), denoting the number of test cases.

For each test case, the first line contains two integer n, m ($1 \le n, m \le 5 \cdot 10^5$), denoting the number of students and the number of algorithms.

The second line contains n integers, the i-th integer a_i ($1 \le a_i \le m$) denoting the number of algorithm the i-th student masters.

It is guaranteed that the sum of n over all testcases does not exceed $5 \cdot 10^5$. Please notice that there is **no limit** on sum of m.

Output

For each test case, output one integer in one line, denoting the answer.

Example

standard input	standard output
2 5 4 1 2 2 3 4 5 10000 5 2 3 4 1	2 3