Palworld

Input file:	`standard input`
Output file:	`standard output`
Time limit:	4 seconds
Memory limit:	256 megabytes

There's a hot new game sweeping the world right now: Palworld. In it, your goal is to create the longest **pal**indrome. (It's a puzzle game!)

When the game starts, there is a string S consisting of n lowercase English letters. You are also given an integer k. As a player, you have the following action, which you must perform **exactly once**:

- Choose an index i ($0 \leq i \leq n$) and insert **at most** k characters after index i of S. Choosing $i = 0$ means you append up to k characters in front of S.

Your score in the game is equal to the length of the longest substring of the resulting string that is a palindrome.

What is the maximum possible score you can get?

Notes:

- A **palindrome** is a string that reads the same forwards and backwards.
- A **substring** of a string is a string obtained by deleting some number of letters (possibly none) in front and/or at the back.

Input

The first line contains t, the number of test cases.

Each test case consists of two lines.

- The first line contains n and k, the length of S and the number of characters you're allowed to insert, respectively.
- The second line contains the string S.

- $1 \leq t \leq 10^4$
- $1 \leq n \leq 2 \cdot 10^5$
- $1 \leq k \leq 100$
- S contains only the characters a through z.
- The sum of n across all test cases does not exceed $2 \cdot 10^5$

Output

For each test case, print a single line containing a single integer: the maximum possible length of the longest palindromic substring of S after the operation.

Example

standard input	standard output
4 1 3 a 4 1 icpc 4 2 icpc 8 4 icecream	4 5 5 11

Note

- In the first example, you can insert 3 characters to turn S into `"abba"`, which is a palindrome of length 4.
- In the second example, it's optimal to append i to S, forming `"icpci"`, which is a palindrome of length 5.
- In the third example, even though we're allowed to insert 2 characters, we're unable to attain a longer palindrome.
- In the fourth example, one optimal final string is `"imaercecream"`, where the substring `"maercecream"` is a length-11 palindrome.