Kick Start 2021 - Round A

K-Goodness String

Problem

Charles defines the goodness score of a string as the number of indices i such that $\mathbf{S}_i \neq \mathbf{S}_{\mathbf{N}-i+1}$ where $1 \leq i \leq \mathbf{N}/2$ (1-indexed). For example, the string `CABABC` has a goodness score of 2 since $\mathbf{S}_2 \neq \mathbf{S}_5$ and $\mathbf{S}_3 \neq \mathbf{S}_4$.

Charles gave Ada a string $\mathbf{S}$ of length $\mathbf{N}$, consisting of uppercase letters and asked her to convert it into a string with a goodness score of $\mathbf{K}$. In one operation, Ada can change any character in the string to any uppercase letter. Could you help Ada find the *minimum* number of operations required to transform the given string into a string with goodness score equal to $\mathbf{K}$?

Input

The first line of the input gives the number of test cases, $\mathbf{T}$. $\mathbf{T}$ test cases follow.

The first line of each test case contains two integers $\mathbf{N}$ and $\mathbf{K}$. The second line of each test case contains a string $\mathbf{S}$ of length $\mathbf{N}$, consisting of uppercase letters.

Output

For each test case, output one line containing `Case #`x`: `y, where x is the test case number (starting from 1) and y is the minimum number of operations required to transform the given string $\mathbf{S}$ into a string with goodness score equal to $\mathbf{K}$.

Limits

Memory limit: 1 GB.
$1 \leq \mathbf{T} \leq 100$.
$0 \leq \mathbf{K} \leq \mathbf{N}/2$.

Test Set 1

Time limit: 20 seconds.
$1 \leq \mathbf{N} \leq 100$.

Test Set 2

Time limit: 40 seconds.
$1 \leq \mathbf{N} \leq 2 \times 10^5$ for at most 10 test cases.
For the remaining cases, $1 \leq \mathbf{N} \leq 100$.

Sample

Sample Input	Sample Output
2 5 1	Case #1: 0 Case #2: 1

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ABCAA
4 2
ABAA
```

In Sample Case #1, the given string already has a goodness score of 1. Therefore the minimum number of operations required is 0.

In Sample Case #2, one option is to change the character at index 1 to `B` in order to have a goodness score of 2. Therefore, the minimum number of operations required is 1.