# Picture Day

## 1 Problem Statement

On group picture day, the entire team gathers outside to take a series of pictures for the company calendar. This year, human resources has decided that the employees will stand in the same order for every picture, but they may be asked to wear different color company shirts in each shots.

For example, Alice, Bob and Charlie may wear red, yellow, and green shirts (respectively) in one picture and red, blue, and red shirts in another picture. There will be a number of pictures taken, each of which has its own arrangement of colors.

To prevent this task from taking all day, you have been asked to plan the shots such that the employees will need to change their shirt the least number of times. The pictures may be taken in any order, as long as a picture is taken with each arrangement.

*Note*: For this problem, you are only asked to output the minimum number of changes, not the ordering. In addition, you are to assume that the employees will show up wearing the appropriate color shirt for the first picture (there is no need for any employee to change their shirt for the first picture), and it does not matter what shirt each employee ends up with.

## 2 Input

The first line of input contains a single integer $\boldsymbol{P}$, ($\mathbf{1} \leq \boldsymbol{P} \leq \mathbf{100}$), which is the number of data sets that follow. Each data set should be processed identically and independently.

Each data set begins with a single line that contains $\boldsymbol{K}$, the data set number, followed by $\boldsymbol{S}$, ($\mathbf{2} \leq \boldsymbol{S} \leq \mathbf{12}$) which is the number of of photos that are to be taken and $\boldsymbol{E}$, ($\mathbf{1} \leq \boldsymbol{E} \leq \mathbf{100}$), the number of employees that will be a part of the pictures. The next $\boldsymbol{P}$ lines contain $\boldsymbol{E}$ characters each, which indicate the shirt color that each employee will wear for a particular photo. The shirt colors are described by a single letter `a-z`, where e.g "`a`" represents some color.

## 3 Output

For each data set there is a single line of output. The single line of output consists of the data set number $\boldsymbol{K}$, followed by a single space followed by the minimum number of shirt changes that are necessary to take all the photos.

## 4 Test Data

| Input | Output |
|---|---|
| 3<br>1 2 9<br>aaabbbccc<br>bbbaaaccc<br>2 3 4<br>aabb<br>babb<br>aaab<br>3 4 5<br>aabbc<br>aaaab<br>abbcc<br>aaabb | 1 6<br>2 2<br>3 5 |

**Test Case #1:**
You must take 2 pictures with 9 employees. In this case, it doesn't matter which order the pictures are taken in, the first 6 employees must change their shirts between pictures. The last 3 employees are wearing the same color shirts in each photo, so they do not contribute to the total number of changes, resulting in a total of 6.

**Test Case #2:**
There are 2 optimal orderings that minimize the number of changes to only 2.
With 3 pictures and 4 employees, the following orderings are possible:
`aabb` → `babb` → `aaab` (3 changes) `aabb` → `aaab` → `babb` (3 changes)
`babb` → `aabb` → `aaab` (2 changes) `babb` → `aaab` → `aabb` (3 changes)
`aaab` → `babb` → `aabb` (3 changes) `aaab` → `aabb` → `babb` (2 changes)

**Test Case #3:**
The ordering: (`aaaab` → `aaabb` → `aabbc` → `abbcc`) is an optimal solution for minimizing the number of shirt changes, and requires only 5.