I know you don't know; Before you said that, I didn't know, but now I know

Claudia is hosting a logic game for two friends, Alexia and Bash.

The game is played on a grid with R rows and C columns. The rows are numbered from 1 to R from top to bottom, and the columns are numbered from 1 to C from left to right. The cell in row r and column c is denoted by (r, c). Each cell is either **white** or **black**. Claudia, Alexia and Bash all know the grid.

Claudia chooses a **secret** white cell, called the *location*. Claudia tells Alexia only the **row** of the location, and tells Bash only the **column** of the location. Alexia and Bash are perfect logicians who never lie, and all of the above is known to everybody.

Then Alexia and Bash have a conversation. They speak one sentence at a time, in any order. In particular, the same person may say several sentences in a row. Each sentence is one of the following six types, where "you" refers to the other person:

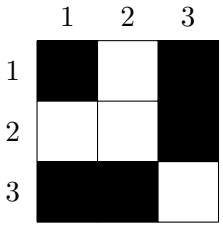
1. I don't know the location.
2. I know the location.
3. I know that you don't know the location.
4. I don't know whether you know the location.
5. Before you said that, I didn't know the location, but I know now.
6. If you said you didn't know the location, I would know the location.

A sentence of type 5 can only be said **immediately after a sentence said by the other person**, and "that" refers only to this last sentence of the other person.

Every sentence refers to what the speaker knows at the moment it is said, taking into account all previous sentences. In a sentence of type 4, the speaker means that among the locations the speaker considers possible, there is at least one where the other person would know the location, and at least one where the other person would not. In a sentence of type 6, the speaker means that if the other person said "I don't know the location" now, then **exactly one** of the locations the speaker considers possible would remain.

A conversation is *valid* if every sentence in it is true, and after the last sentence, both Alexia and Bash know the location, and so does anyone who knows the grid and listens to the conversation.

For example, consider the following grid with 3 rows and 3 columns, whose white cells are $(1, 2)$, $(2, 1)$, $(2, 2)$ and $(3, 3)$.



- If the location is $(1, 2)$, the following conversation is valid:

1. Alexia: "I know that you don't know the location."
2. Bash: "Before you said that, I didn't know the location, but I know now."

Explanation:

- At the beginning of the game, Alexia was told that the secret cell is in row 1, which contains only one white cell $(1, 2)$. Bash was told that the cell is in column 2, which contains two white cells, so Bash does not know the location.
- After Alexia's sentence, Bash knows that the secret cell cannot be $(2, 2)$. This is because, if the secret cell were in row 2, Alexia would consider $(2, 1)$ possible, and if the secret cell were $(2, 1)$, Bash would know the location. So Alexia's sentence would be false. Hence, Bash now knows that the secret cell is $(1, 2)$, and Bash's sentence is true.

- If the location is $(2, 2)$, the following conversation is valid:

1. Alexia: "If you said you didn't know the location, I would know the location."
2. Alexia: "I don't know the location."
3. Bash: "Before you said that, I didn't know the location, but I know now."

Explanation:

- Bash would not know the location only if it is in column 2, i.e., $(1, 2)$ or $(2, 2)$. Each of rows 1 and 2 contains exactly one of these cells, but row 3 contains none. So Alexia's first sentence is true, and it tells everybody that the location is not $(3, 3)$.
- Alexia's second sentence is true only for row 2, so the location is $(2, 1)$ or $(2, 2)$.
- Bash was told column 2. Right before Alexia's second sentence, both $(1, 2)$ and $(2, 2)$ were possible, and now only $(2, 2)$ is. If the location were $(2, 1)$, Bash would have known it all along, so Bash's sentence would be false. Hence, everybody now knows that the location is $(2, 2)$.

- If the location is $(3, 3)$, the following conversation is **not** valid:

1. Alexia: "I know the location."
2. Bash: "I know the location."

Explanation: Both sentences are true, and both Alexia and Bash know the location. However, a listener cannot tell whether the location is $(1, 2)$ or $(3, 3)$.

For each white cell, determine whether there exists a valid conversation with **at most** 200 **sentences** if Claudia chooses that cell as the location, and if so, find one.

Input

Each test contains multiple test cases. The first line contains the number of test cases τ ($1 \le \tau \le 50$). The description of the test cases follows.

The first line of each test case contains two integers R and C ($1 \le R, C \le 7$) – the number of rows and the number of columns of the grid.

Each of the next R lines contains a string of C characters. The c-th character of the r-th line is `W` if the cell (r, c) is white, or `B` if it is black. There is at least one white cell.

It is guaranteed that the sum of $R \cdot C$ over all test cases does not exceed 50.

Output

For the T-th test case, first print a line `Case #`T`:`. Then process the white cells in increasing order of row, and for cells in the same row, in increasing order of column. For each white cell (r, c):

- If there is no valid conversation with at most 200 sentences, print a line with three integers r, c and -1.
- Otherwise, print a line with three integers r, c and k ($0 \le k \le 200$) – the number of sentences in a valid conversation. Then print k lines describing the sentences in order. Each line contains the letter `A` if the sentence is said by Alexia or `B` if it is said by Bash, immediately followed by the type of the sentence (an integer from 1 to 6). For example, `A3` means that Alexia says "I know that you don't know the location".

You do not need to minimize k. If there are multiple valid conversations, you can output any of them.

Sample Input 1	Sample Output 1
1 3 3 BWB WWB BBW	Case #1: 1 2 2 A3 B5 2 1 2 B3 A5 2 2 3 A6 A1 B5 3 3 -1

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