

Re-Volt

You will be given an integer **n** for the size of the square matrix and an integer for the count of commands. On the next **n** lines, you will receive the rows of the matrix. The player starts at a random position (the player is marked with "**f**") and **all of the empty slots** will be filled with "**-**" (**dash**). The goal is to reach the finish mark which will be marked with "**F**". On the field there can also be bonuses and traps. Bonuses are marked with "**B**" and traps are marked with "**T**".

Each turn you will be given commands for **the player's movement**. If the player **goes out** of the matrix, he comes in from **the other side**. For example, if the player is on 0, 0 and the next command is left, he goes to the last spot on the first row.

If the player steps on a bonus, he should move another step forward in the direction he is going. If the player steps on a trap, he should move a step backwards.

When the player reaches the **finish mark** or the **count of commands is reached** the game ends.

Input

- On the first line, you are given the integer **N** – the size of the square matrix.
- On the second you are given the count of commands.
- The next **N** lines holds the values for every row.
- On each of the next lines you will get commands for movement directions.

Output

- If the player reaches the finish mark, print:
 - "**Player won!**"
- If the player reaches the commands count and hasn't reached the finish mark print:
 - "**Player lost!**"
- In the end print the matrix.

Constraints

- The size of the matrix will be between **[2...20]**.
- The players will always be indicated with "**f**".
- If the player steps on the finish mark at the same time as his last command, he wins the game.
- Commands will be in the format **up, down, left or right**.
- There won't be a case where you bypass the finish while you are on a trap or a bonus.
- A trap will never place you into a bonus or another trap and a bonus will never place you into a trap or another bonus.

Examples

Input	Output	Comments
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5 5 ----- ----- -f--- -B--- --T-- --T-- -F--- down right down	Player won! ----- ----- -B--- --T-- -f---	The first command is down so f moves down. On turn 1, the player steps on a bonus and does an additional step. On turn 2, the player steps on a trap and goes a step back. After each turn the field is: <div style="display: flex; justify-content: space-around; margin: 10px 0;"> 123</div> ----- ----- -B--- -B--- -B--- -fT-- -fT-- --T-- -F--- -F--- -f--- On turn 3 f reaches the finish 'F' and wins the game.
4 3 ----- -f-B --T- ---F up up left	Player lost! ----- ---B --T- f--F	