**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** |
| 5  5  -----  -f---  -B---  --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:  1 2 3  ----- ----- -----  ----- ----- -----  -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 |  |