

Tron Racers

The new TRON tournament has started and you have to keep track of the players on the field.

You will be given an integer **n** for the size of the matrix. On the next **n** lines, you will receive the rows of the matrix. The game starts with two players (first player is marked with "**f**" and the second player is marked with "**s**") in random positions and **all of the empty slots** will be filled with "*".

Each turn you will be given commands **respectively for each player's movement**. The **first command** is for the first player and the **second** is for the second player. After a player moves, **he leaves a trail** on the field. The symbol that marks the trail is the same as the player's symbol. If a 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 in the first row.

If a player steps on the other player's trail, he dies. When a player dies in the field, you should write "**x**" in the position where he died.

When **only one of the players** is left alive on the field the game ends.

Input

- On the first line, you are given the integer N – the size of the square matrix.
- The next N lines holds the values for every row.
- On each of the next lines you will get two commands separated by space .

Output

- In the end print the matrix.

Constraints

- The size of the matrix will be between **[2...20]**.
- There will always be exactly two players.
- The players will always be indicated with "**f**" for the first one and "**s**" for the second one.
- There will always be enough commands to finish the game with one player alive.
- There will not be commands where a player goes back and steps on his trail from the previous turn.
- Commands will be in the format **up**, **down**, **left** or **right**.

Examples

Input	Output	Comments
5 ***f* **sff **S*f	***f* **sff **S*f	The first command is down down so f moves down and s moves down. After each turn the field is: 1 2 3 4 5 6

***** ***** ***** down down right down down right down down down left left left	**ssf **sxf	***f* ***f* ***f* ***f* ***f* ***f* **sf* **sff **sff **sff **sff **sff **s** **s** **s*f **s*f **s*f **s*f ***** **s** **ss* **ssf **ssf **ssf ***** ***** ***s* **ssf **sxf On turn 6 f crashes into s 's trail and f dies. As there is only one player left alive s is the only one left he is the winner.
4 *f** **** **s* **** down up down right right right	*f** *fss *fX* ****	