Part II

WarGamesSim

Have you ever heard about "Conway's Game of Life", played an old-fashioned flash game called "The Sandbox" or played a more recent game called "Noita"? All of these games use a form of cellular automata that allows world simulation to evolve in unpredictable ways and today you will be trying to create your own zero-player game WarGamesSim!

Task

Create a CLI (command-line interface) program which reads its input from a file. The file provides: n - number of iterations to simulate, w h - width and height of a world, h lines of w characters describing initial world state, and prints world state after n iterations.

World is a grid of cells ($w * h$), everything outside of the grid is treated as a *Network* cell. To advance a cell one timestep, only 8 neighboring cells need to be checked. All cells do their actions at the same time (only look into the world state at the start of the timestep). World is composed out of 5 types of distinct cells with different rules (rules at a top must be executed first):

- '.' (*Network* cell):
    - If 2 or more, but less then 5 neighboring cells are *Malware* it becomes *Malware*
    - If 2 neighboring cells are *Healthy Server* it becomes *FireWall*
    - If 1 or more neighboring cells is *Infected Server* it becomes *Malware*
    - Otherwise the cell stays the same
- '*' (*Malware* cell):
    - If all neighboring cells are *Network*, it also becomes a *Network*
    - If 2 or more neighboring cells are *FireWall*, it also becomes a *FireWall*
    - If more than 5 neighboring cells are a *Malware* it becomes *Network*
    - If 1 or more neighboring cell is *Healthy Server* it becomes *Network*
    - Otherwise the cell stays the same
- 'f' (*FireWall* cell)
    - If 5 or more neighboring cells are *Malware* it becomes *Network*
    - Otherwise the cell stays the same
- 'o' (*Healthy Server* cell):
    - If 1 or more neighboring cell is *Malware* it becomes *Infected Server*
    - Otherwise the cell stays the same
- 'x' (*Infected Server* cell)

- ○ If 8 neighboring cells are *FireWall* it becomes *Healthy Server*
- ○ Otherwise the cell stays the same

Example:

Execute:

```
$ wargames input.txt
```

Input file:

```
6
10 5
.....o....
..........
.....o....
*.........
*.........
```

Output:

```
****.o....
*.**fff...
*.**fx*...
*...***...
*******...
```

Steps:

For debugging purposes here is how this example World evolved:

Step 1:	Step 2:
`.....o....`	`.....o....`
`....fff...`	`....fff...`
`.....o....`	`**...o....`
`**........`	`***.......`

```
**........
```

```
***......
```

Step 3:

```
.....o....
**..fff...
***..o....
*.**......
****......
```

Step 4:

```
**...o....
***.fff...
*.**.o....
*..**.....
*****.....
```

Step 5:

```
***..o....
*.**fff...
*.***x....
*....*....
******....
```