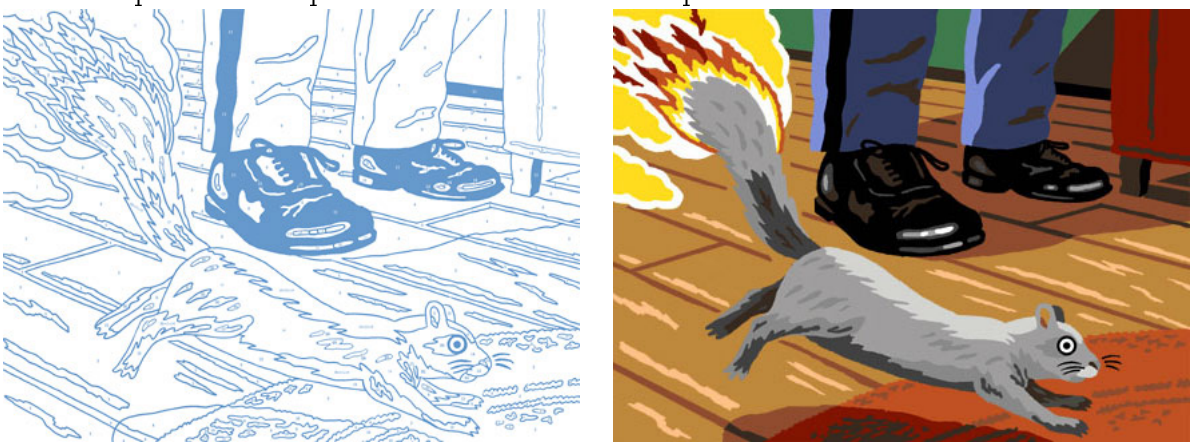
2006 Canadian Computing Competition
Day 2, Question 3

Input file: `paint.in`
Output file: `paint.out`
Source file: `n:\paint\paint.___`

Paint by Numbers

Way back before you were born, there was a really bad craft/hobby called *paint-by-numbers*: you were given a line drawing, with numbers in each enclosed region, and the number corresponded to a particular colour. An example is shown below:



(picture from `http://www.thislife.org/paintings/`)

The problem you have to solve is much more linear, in a way.

You will be given an n-by-m grid ($1 \leq n, m \leq 32$) which you will "colour" in with either a dot ('.') or a star ('*').

Of course, the grid will not be specified in the usual paint-by-numbers way, since this would be too easy.

Instead, you will you have to infer which cells are blank and which contain a star. The only information you will be given are a collection of $n + m$ sequences of numbers, one sequence for each row and column. The sequence will indicate the size of each continuous block of stars. There must be at least one dot between two consecutive blocks of stars.

An example is shown below (which is supposed to look fish-like):

		1	1					
		1	1	2	2	4	4	2
2	2							
	5							
	5							
2	2							

(Unsolved Puzzle)

		1	1					
		1	1	2	2	4	4	2
2	2	*	*	.	.	*	*	.
	5	.	.	*	*	*	*	*
	5	.	.	*	*	*	*	*
2	2	*	*	.	.	*	*	.

(Solved Puzzle)

You may notice that some paint-by-number patterns are not uniquely solvable. For example,

	1	1
1		
1		

has two solutions

	1	1
1	*	.
1	.	*

and

	1	1
1	.	*
1	*	.

.

For this problem, you may assume that *any* solution which satisfies the specification is correct.

You should note that 50% of the marks for this question will come from test cases where $1 \leq n, m \leq 6$.

Input

Input consists of a total of $n + m + 2$ lines. The first line of input consists of an integer n ($1 \leq n \leq 32$), the number of rows. The second line of input consists of an integer m ($1 \leq m \leq 32$), the number of columns. On the next n lines, there will be sequences which describe each of the n rows (from top to bottom). Each line will contain some positive integers, with a space between adjacent integers, and the sequence will terminate with the integer 0. On the next m lines describe the m columns (from left to right), the same format as the rows are specified.

Output

Output consists of n lines, each line composed of m characters, where each character is either a dot ('.') or a star ('*').

Sample Input 1

```
4
7
2 2 0
5 0
5 0
2 2 0
1 1 0
1 1 0
2 0
2 0
4 0
4 0
2 0
```

Sample Output 1 for Sample Input 1

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

Sample Input 2

```
4
4
2 1 0
3 0
3 0
1 1 0
4 0
3 0
3 0
1 0
```

Sample Output for Sample Input 2

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

Note, you may want to use a GUI-based version to see what the output files look like in a more visually-friendly way.

On your `N:` drive, you will find a file named `PaintByNumberGUI.jar`. If you have an output file that you want to see nicely, you can type the following at the command-line:

`java -jar PaintByNumberGUI.jar outputFilename`

where `outputFilename` contains a rectangular collection of `*` and `.`.