

Problem 3—Always Look On The Bright Side Of Life

Brian is always on the bright side of life. Given a word grid containing only capital letters, the word LIFE will appear exactly once, it may appear forwards, backwards, up, down, or diagonally. The horizontal, vertical, or diagonal line on which LIFE appears divides the grid into two pieces. The word BRIGHT will also appear exactly once in the grid, to one side or the other of LIFE. (BRIGHT will not cross or touch the LIFE axis.) Now, the word BRIAN may appear any number of times in the grid, but it will appear only once on the same side of LIFE that contains BRIGHT. Thus, to find the correct BRIAN, you must look on the BRIGHT side of LIFE.

INPUT SPECIFICATION. Each case begins with two unsigned decimal integers, representing the row and column size of the word grid. The integers will be separated by one space and followed by <EOLN>. The word grid itself will follow, formatted as shown below. An extra <EOLN> will follow each data case. The last data case will be followed by “0 0<EOLN>”. This is not to be processed; it just signals the end of input.

OUTPUT SPECIFICATION. Each output case should appear in the same order as the corresponding input case. The output case should begin “Case *c*:<EOLN><EOLN>”. (*c* is the case number.) The input grid will follow, except the correct BRIAN (and only the correct BRIAN) has been switched to lowercase. An extra <EOLN> follows the grid.

SAMPLE INPUT.

```
4 6<EOLN>
BRIGHT<EOLN>
XNAIRE<EOLN>
XLIFEX<EOLN>
BRIANX<EOLN>
<EOLN>
7 22<EOLN>
BRIANXXXXXXXXXXBRIGHT<EOLN>
XXXXXXXXXXXXXXXXXNAIRBN<EOLN>
BXXXXXXXXXXXXXXXXXEXXXA<EOLN>
RXXXXXXXXXXXXXXXXFXFI<EOLN>
IXXXXXXXXXXXXXXXXXIXR<EOLN>
AXXXXXXXXXXXXXXXXXLB<EOLN>
NXXXXXBRIANXXXXXXXXXX<EOLN>
<EOLN>
0 0<EOLN>
<EOF>
```

SAMPLE OUTPUT.

```
Case 1:<EOLN>
<EOLN>
BRIGHT<EOLN>
Xnairb<EOLN>
XLIFEX<EOLN>
BRIANX<EOLN>
<EOLN>
Case 2:<EOLN>
<EOLN>
BRIANXXXXXXXXXXBRIGHT<EOLN>
XXXXXXXXXXXXXXXXXNAIRBn<EOLN>
BXXXXXXXXXXXXXXXXXEXXXa<EOLN>
RXXXXXXXXXXXXXXXXFXFi<EOLN>
IXXXXXXXXXXXXXXXXXIXr<EOLN>
AXXXXXXXXXXXXXXXXXLb<EOLN>
NXXXXXBRIANXXXXXXXXXX<EOLN>
<EOLN>
<EOF>
```