PROB5: SHEET

See if a spreadsheet has a consistent formulation.

DESCRIPTION

Any given cell of a spreadsheet can have a formula that depends on the value from some other cell. Before trying to calculate the value of a cell it is important to determine if the definition of the formula for that cell is circular.

Our spreadsheet only has a limited formulation for expressions:

```
definition := cell "=" expression
expression := term | expression "+" term | expression " " term
term := factor | term "*" factor | term "/" factor
factor := number | cell | "(" expression ")"
number := digit | number digit
digit := "0" | "1" | "2" | "3" | "4" | "5" | "6" | "7" | "8" | "9"
cell := "R" digit digit "C" digit digit
```

Valid cell rows and columns are 1 through 20, so that a total of 400 cells are available in our spreadsheet.

INPUT: prob5.dat

The input file will contain one or more lines, each representing cells that are defined in the spreadsheet.

An example input file would be

```
       column    11111111122222222223
       12345678901234567890234567890
line 1:R01C01=1[EOL]
     2:R01C02=2[EOL]
     3:R01C03=R01C01+R01C02[EOL]
     4:R02C01=(R03C02+1)*R01C03[EOL]
     5:R03C02=R02C01[EOL]
      :[EOF]
```

Note that, if a an expression in some cell refers to some other cell, the contents of that other cell will always be defined.

OUTPUT: prob5.out

Other than the standard header and trailer messages, a single line is printed for each cell defined in the input file (and in the same order). This should be the cell name followed by "circular" if evaluating the cell results in a circular definition (either directly or indirectly). If the cell can be evaluated without a circular definition, then the word "ok" should follow the cell.

The correct output corresponding to the example input file would be:

```
       column    11111111122222222223
       12345678901234567890234567890
line 1:Program 5 by team 0[EOL]
     2:R01C01 ok[EOL]
```

```
3:R01C02 ok[EOL]
4:R01C03 ok[EOL]
5:R02C01 circular[EOL]
6:R03C02 circular[EOL]
7:End of program 5 by team 0[EOL]
 :[EOF]
```