STA Online Computer Programming Contest (DWITE)
February 2003

Problem 1

LOGO

Remember Logo, the introductory computer programming environment, that had students program a “turtle” to move around the screen.

This problem involves determining the position of a turtle exploring a grid on the screen.

Given the dimensions of a rectangular grid, you are to write a program that determines the final position of 5 different turtles, each with a given starting position and set of instructions.

A turtle *position* consists of a grid coordinate (a pair of integers: x-coordinate followed by y-coordinate) and an orientation (N,S,E,W for north, south, east, and west). A turtle *instruction* is a string of the letters 'L', 'R', and 'F' which represent, respectively, the instructions:

> ***Left***: the turtle turns left 90 degrees and remains on the current grid point.
> ***Right***: the turtle turns right 90 degrees and remains on the current grid point.
> ***Forward***: the turtle moves forward one grid point in the direction of the current orientation and maintains the same orientation.

The direction ***North*** corresponds to the direction from grid point (x,y) to grid point (x,y+1).

Since the grid is rectangular and bounded, a turtle that moves “off” an edge of the grid is lost forever. However, lost turtles leave a turtle “scent” that prohibits subsequent turtles from dropping off the world at the same grid point. The scent is left at the last grid position the turtle occupied before disappearing over the edge. An instruction to move “off” the world from a grid point from which a turtle has been previously lost is simply ignored by the current turtle.

The input file (DATA1) will be set up the following way:

> The first line of input is the upper-right coordinates of the rectangular world (both values less than or equal to 100), the lower-left coordinates are assumed to be 0,0.
>
> The remaining input consists of five sequences of turtle positions and instructions (two lines per turtle). A position consists of two integers specifying the initial coordinates of the turtle and an orientation (N,S,E,W), all separated by a single space on one line. A turtle instruction is a string of the letters 'L', 'R', and 'F' on one line.

Each turtle is processed sequentially, i.e., finishes executing the turtle instructions before the next turtle begins execution. You may assume that all initial turtle positions are within the bounds of the specified grid. All instruction strings will be less than 100 characters in length.

The output file (OUT1) will contain for each turtle position/instruction in the input, the final grid position and orientation of the turtle. If a turtle falls off the edge of the grid the word “LOST” should be printed after the position and orientation. One space separates each of these items of information.

Sample Input (Only three turtle starting positions and instructions given)

```
6 4
3 1 N
FRFFLFLF
1 3 E
FFLFFFLF
2 2 S
LLFFRFLFFRFFRF
```

Sample Output

```
4 3 W
3 4 N LOST
5 3 S
```