4. Fifteen Puzzle

PROBLEM: The "Fifteen Puzzle" is a sliding puzzle that consists of a frame of numbered square tiles in random order with one empty space. The object of the puzzle is to place the tiles in order by making sliding moves that use the empty space.

In this problem you'll use a 4x4 grid. The grid will start with one cell empty (we'll tell you which one) and the other cells will be filled with tiles numbered 1 through 15, starting in the upper left corner. Adjacent tiles can move to the empty space. The diagram at the left below shows the number of each cell in the grid. The second diagram shows an initial configuration of the puzzle with space 7 empty. The third diagram shows moving the 10 tile up. The last diagram shows moving the 9 tile over to the empty space left by the 10 tile.

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

1	2	3	4
5	6		7
8	9	10	11
12	13	14	15

1	2	3	4
5	6	10	7
8	9		11
12	13	14	15

1	2	3	4
5	6	10	7
8		9	11
12	13	14	15

INPUT: There will be 10 lines of input. Each line will contain the initial location of the empty space, following by a string containing the moves. The moves are R, L, A, or B, representing moving the tile to the Right of, Left of, Above or Below the empty space. In the first line of sample data, the empty space is at location 7, and then the tile below that (that is, tile 10) is moved up, and the tile to the left of the empty space (that is, tile 9) is moved to the right.

OUTPUT: For each input line, print the final location of the empty space.

SAMPLE INPUT

7 BL
7 BLARBLAR
7 BBLLAA
10 RRAALLBB
1 RRBRAL
10 LBRA
2 RRBLLAL
8 BBLLAALBAR
16 ALALALBRBRBR
4 LBLBLBRRRAAA

SAMPLE OUTPUT

1. 10
2.   7
3.   5
4. 10
5.   3
6. 10
7.   1
8.   6
9. 16
10.   4

TEST DATA

TEST INPUT	TEST OUTPUT
1 BRBRBRALAL	1. 6
11 BLARALBRALBBL	2. 13
7 ARBLARBLARBLAR	3. 4
16 LALALARBRBRB	4. 16
16 AAALLBBBRRALL	5. 10
2 LBRBBRALALA	6. 1
5 RRRBBLLLAAARBLBRBLA	7. 9
12 BLLAARRBBLARBLLARRB	8. 16
15 ABABLRLRABABRLRL	9. 15
13 AAARRRBBLLAARRBBLARB	10. 12