American Computer Science League

2017-2018 **Contest #3**

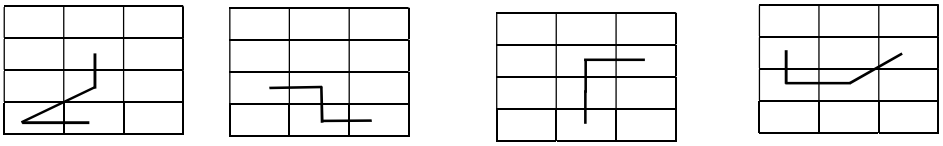
SENIOR DIVISION

ACSL Walk

PROBLEM: Given an array to direct a walker along a path, find the ending location of the walker. This problem will use an 8x8 array. The array will contain the digits 1 - 7.

Given a starting cell and a direction from which it is entered, Left, Right, Above or Below commands, the walker moves to the center of that cell. His path will be determined by moving one cell in the direction given by the formula: cell value * 45 . The direction of this move and all subsequent moves is always counted from the direction that the cell was entered with the vertex of the angle in the center of the cell and counted in a clockwise direction.. The entry path is considered 0 degrees. In the 8x8 array below (1, 1) is in the lower left hand side. The cell value is 2. (2, 4) has a cell value of 3. If (2, 4) is initially entered from the Left, cell (2, 3), the direction of the first move would be 3 * 45 =135 degrees which puts the walker at (3, 5). The next move would be 4 * 45 =180 and would end a path of length 2 at (4,6).

Ex 1. 2. 3. 4.



1. Entering (1, 1) that stores a 7 (315 degrees) from the Right moves the path to (2, 2) that stores a 3 (135 degrees) and ends at (3, 2).
2. Entering (2, 2) that stores a 6 (270 degrees) from the Left moves the path to (1, 2) that stores a 2 (90 degrees) and ends at (1, 3).
3. Entering (2, 2) that stores a 4 (180 degrees) from Below moves the path to (3, 2) that stores a 6 (270 degrees) and ends at (3, 3).
4. Entering (2, 1) that stores a 2 (90 degrees) from Above moves the path to (2, 2) that stores 3 (135 degrees) and ends at (3, 3).

4	2	3	4	5	7	6	5
1	6	5	2	5	4	1	1
1	3	7	4	7	6	4	3
1	1	5	2	4	1	1	2
5	1	2	7	6	2	4	7
1	7	3	2	4	2	7	1
6	7	5	3	2	1	2	6
2	3	7	1	6	4	7	1

In order for no move to end outside the given 8x8 array, if a move ends in column 9, automatically move to column 1 in the same row. If a move ends in column 0, automatically move to column 8 in the same row. If a move ends in row 9, automatically move to row 1 in the same column. If a move ends in row 0, automatically move to row 8 in the same column. Therefore, a move to position (0,9) becomes a move to position (8,1). The angle from which it is moved does not change. Therefore, in the grid above, entering (8, 5) that stores a 5 (225 degrees) from Below moves the path to (1, 6) that stores a 4 (180 degrees) and ends at (2, 7).

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INPUT: There will be 6 lines of input. The first line will contain 8 hexadecimal values that when converted to octal will give the row values of the array starting at (1,1). Inputs 2-6 will each contain 2 integers giving the starting location in row/col order, a one-character string giving the direction **A**bove, **B**elow, **L**eft, **R**ight and a integer giving the number of moves to make. Always revert back to the original array to start each walk.

OUTPUT: For each line of input (2 – 6) print the final location of the walker in row/col order.

SAMPLE INPUT	**SAMPLE OUTPUT**
1. 4F9D39, DEB456, 3DA8B9, A57CA7, 26A84A, 2FCFA3, 3AAB09, 89CBF5	
2. 1, 2, L, 2	1. 2, 4
3. 5, 3, A, 4	2. 6, 4
4. 3, 5, B, 2	3. 4, 6
5. 6, 7, R, 5	4. 8, 7
6. 4, 7, L, 6	5. 3, 7

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TEST INPUT **TEST OUTPUT**

1. F123AB, CABFAB, 897654, ABEACE, 963ACE, 759BDF, 84C26E, ABCDEF

2. 8, 8, L, 4
3. 1, 1, A, 8
4. 2, 7, R, 5
5. 6, 3, B, 10
6. 4, 4, L, 15

1. 6, 8
2. 2, 4
3. 3, 5
4. 2, 1
5. 4, 4