Nikoli Selection

Instruction Booklet

LMI Monthly Puzzle Test

9th/10th July 2011
90 minutes

by Tom "detuned" Collyer

An Apology & Acknowledgements

As regular LMI solvers will remember, there were two monthly puzzle tests in October 2010, in the build up to that year's World Puzzle Championships. In the rushed madness leading up to the first of the monthly tests, indeed the first Nikoli Selection, several aspects of the test's preparation had no time to be addressed, and as such there were multiple problems associated with the test – there were two "puzzles" with no legal solutions, a further puzzle with multiple solutions, and yet another puzzle initially published with a misprint which also rendered it unsolvable. This reflected badly on me, but also on LMI, and I am grateful for the opportunity to try and put things right for the organisation that has been the driving force behind the recent renaissance in puzzle solving.

Nikoli itself is a world renowned puzzle publisher based in Japan. They are most famous for refining an obscure puzzle – which went by the name of Number Place – featuring in an American puzzle magazine, and thus providing the genesis of the all-conquering sudoku phenomenon. However, they publish countless other puzzle types, with each individual puzzle intricately handcrafted into works of beauty. In my eyes they remain the gold standard in the world of puzzles and are certainly my greatest inspiration when it comes to making my own puzzles, (which incidentally, you can find more of on my blog, detuned radio).

In putting together this test, I have been indebted to the excellent advice of Deb Mohanty, with whom I have had many useful conversations. I'd also like to thank Rakesh Rai and David McNeill for test solving the puzzles.

Test Structure

The test is structured in a similar manner as before: there are two parts to the test. The first consists of 16 different nikoli style puzzles. Solvers finishing the first part of the test in time will be awarded a small bonus based on the remaining minutes left on the clock after the last correct submission time.

The second part of the test is the marathon puzzle section, which should be viewed as an additional bonus. **It is highly recommended that you do not attempt solving the marathon puzzles before correctly solving the first part of the test!** There is a choice of three different marathon puzzle types. It is not expected that any solver will be able to solve all three marathon puzzles within the time limit; rather the solver is expected to make a preferred choice between the three puzzles if and when they get to that stage.

The three marathon puzzles are: **Slitherlink, Heyawake** and **Yajilin.** The details of the first 16 puzzles are detailed below:

Puzzle	Points
Akari	20
Fillomino	20
Hashiwokakero	15
Heyawake	20
Hitori	20
Kakuro	15
LITS	20
Masyu	20
Numberlink	5
Nurikabe	15
Ripple Effect	20

Puzzle	Points
Shikaku	25
Slitherlink	10
Sudoku	15
Suraromu	20
Yajilin	20
Subtotal:	**280**
Time bonus (for each minute saved)	1
1 Marathon Puzzle	50
2 Marathon Puzzles	105
3 Marathon Puzzles	170
Total:	**450**

Puzzle Examples

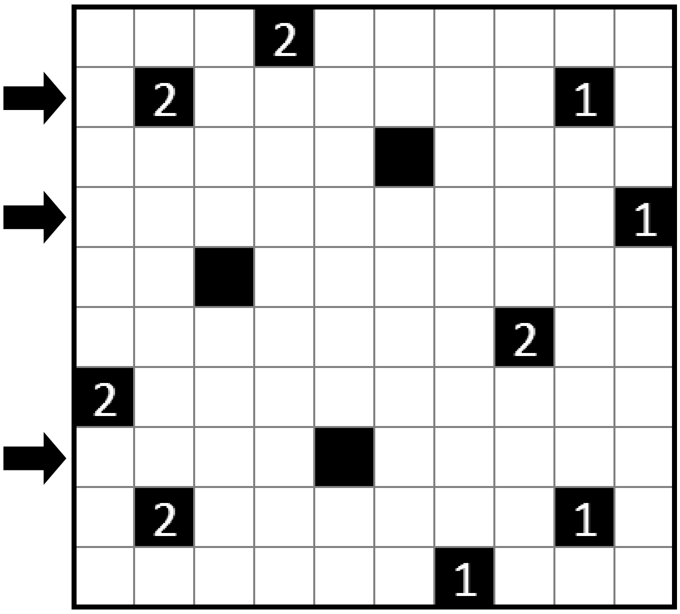
The majority of the following puzzles have been taken from my blog, [detuned radio](), and all rights have been reserved.

Akari (Light-up) **20 points**

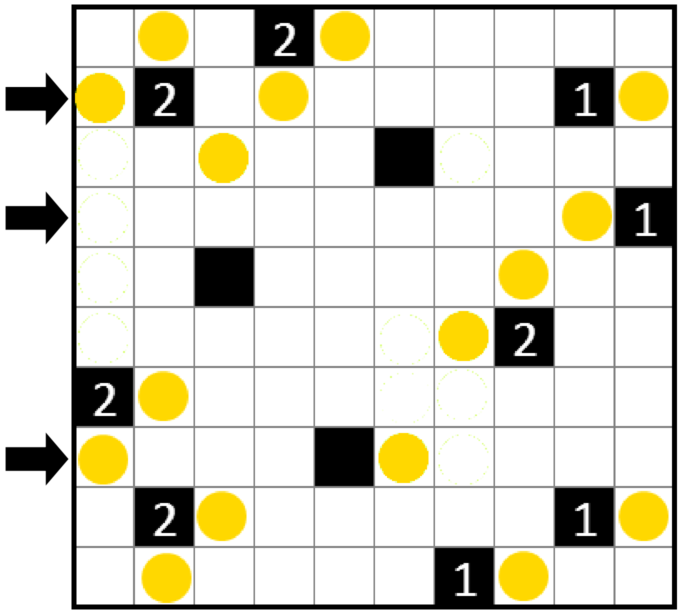
Place some light bulbs in the grid. Each numbered black cell indicates how many lights bulbs are adjacent to that cell. The light bulbs emit rays that travel horizontally and vertically until they hit a black cell or the edge of the grid. Each white cell must be illuminated by a light bulb, and any two light bulbs must not illuminate each other.

Answer key: enter the number of light bulbs in the marked rows. For the example, the correct answer is **3,1,2**.

Example



Solution



Fillomino

20 points

Place a number in each cell of the grid, so that each number is contained in a polyomino of that size. Polyominoes of the same size must not be adjacent via a common cell-edge.

Answer key: enter the marked row from left to right, followed by the marked column, from top to bottom. Where a corresponding number has two digits, use only the last digit. For the example, the correct answer is **2344554514, 3345441555**.

Example

		4	2					5	2
3		4	5		3	4		4	2
2					4	4			
	3	4		4	4		4	4	
	2	3		3	4		5	4	
			3	4					4
2	3		3	4		2	4		3
1	4					5	2		

Solution

3	3	4	2	2	3	3	5	5	2
3	4	4	5	5	3	4	5	4	2
2	4	1	4	5	4	4	5	4	4
2	3	4	4	5	5	4	5	1	4
3	3	4	1	4	4	1	4	4	1
2	2	3	3	3	4	4	5	4	4
1	3	1	4	4	1	5	5	5	5
2	3	4	3	4	5	2	4	4	4
2	3	4	3	4	5	2	4	3	3
1	4	4	3	5	5	5	2	2	3

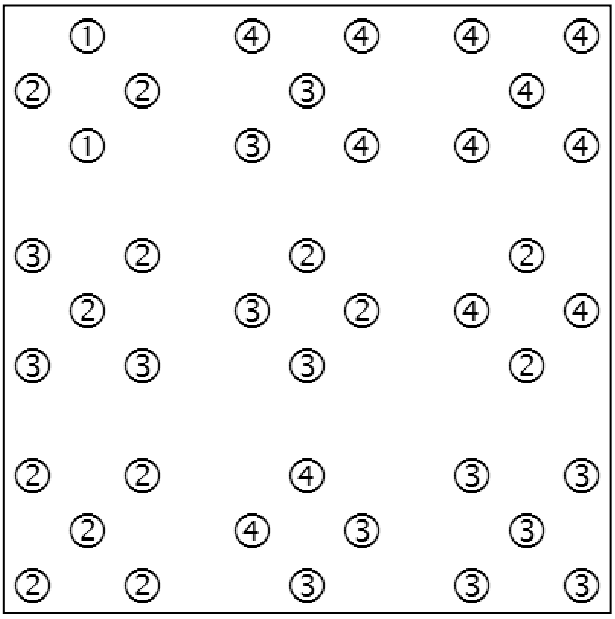
Hashiwokakero (Bridges)

15 points

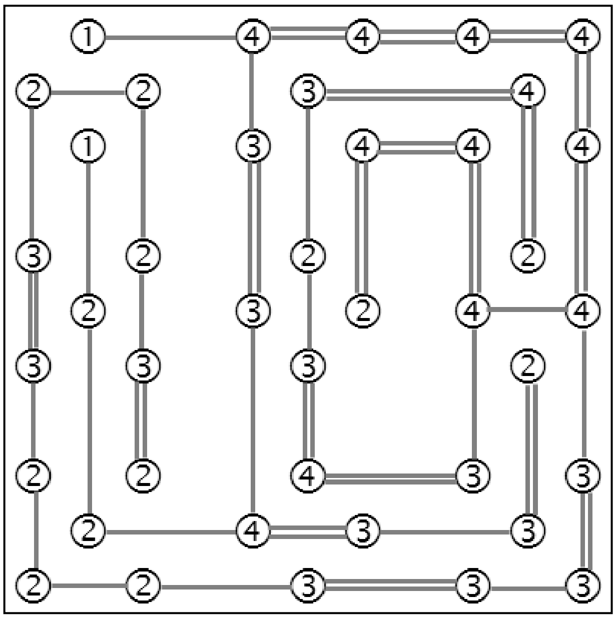
Connect each of the numbered islands in the grid via horizontal and vertical bridges. Bridges are not allowed to cross each other. Each numbered island has that many bridges leading away from it, and at most two bridges are allowed to connect a pair of islands. There must be a sequence of bridges that links one given island to any other.

Answer key: enter the number of horizontal double bridges. For the example, the correct answer is **8**.

Example



Solution

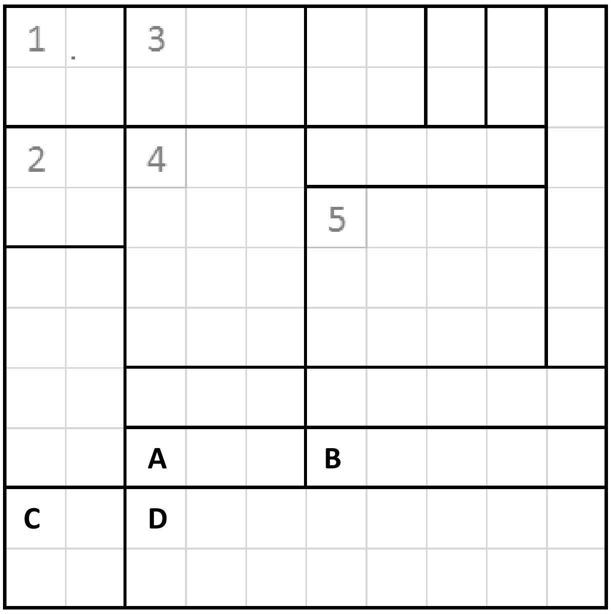


HEYAWAKE **20 points**

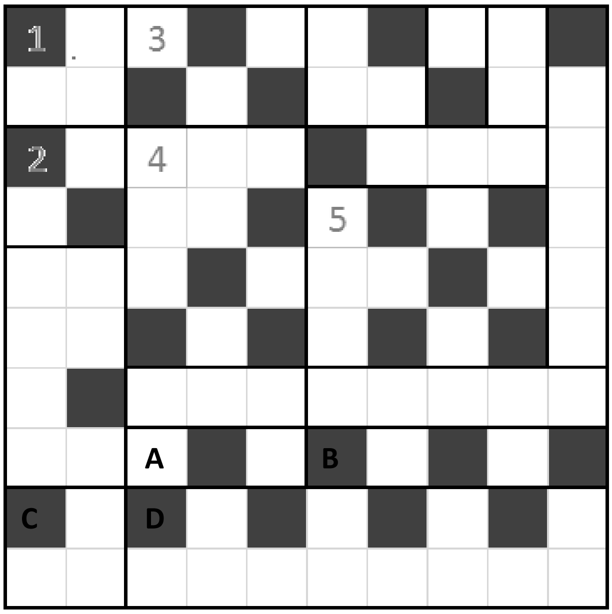
Shade some cells in the grid. The grid is divided up into rooms. If a room is marked by a number, then there must be that many shaded cells within it. Shaded cells must not share an edge, and the remaining unshaded cells must form a connected area via horizontal or vertical paths. The unshaded cells must not traverse more than two rooms in a horizontal or vertical straight line.

Answer key: enter the number of shaded cells in each marked room ABCD. For the example, the correct answer is 1,3,1,4.

Example



Solution



HITORI **20 points**

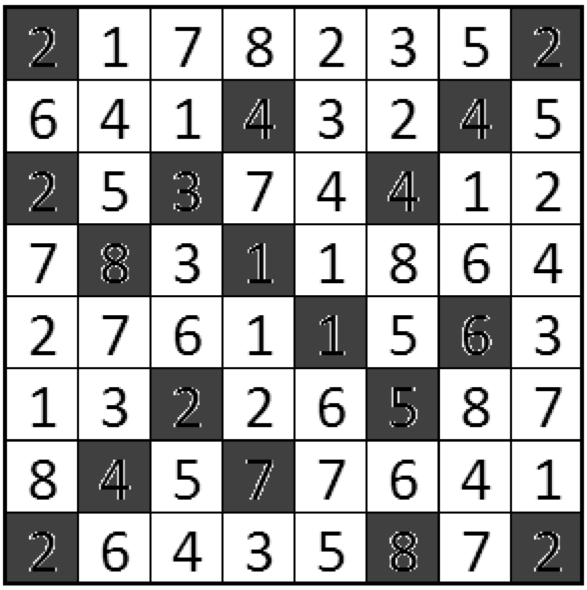
Shade in some cells in the grid so that in the remaining unshaded cells at most one of each number appears in any row or column. Shaded cells must not share an edge, and the remaining unshaded cells must form a connected area via horizontal or vertical paths.

Answer key: enter the number of shaded cells in each row, starting with the top row. For the example, the correct answer is 22322223.

Example

2	1	7	8	2	3	5	2
6	4	1	4	3	2	4	5
2	5	3	7	4	4	1	2
7	8	3	1	1	8	6	4
2	7	6	1	1	5	6	3
1	3	2	2	6	5	8	7
8	4	5	7	7	6	4	1
2	6	4	3	5	8	7	2

Solution



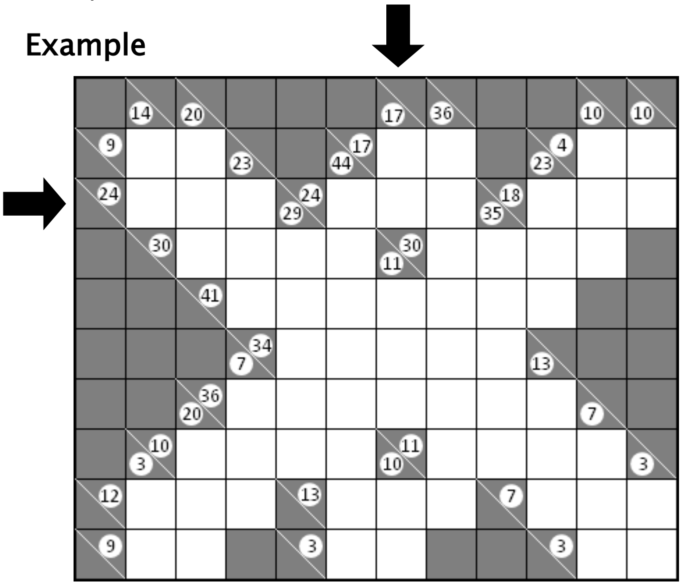
Kakuro

15 points

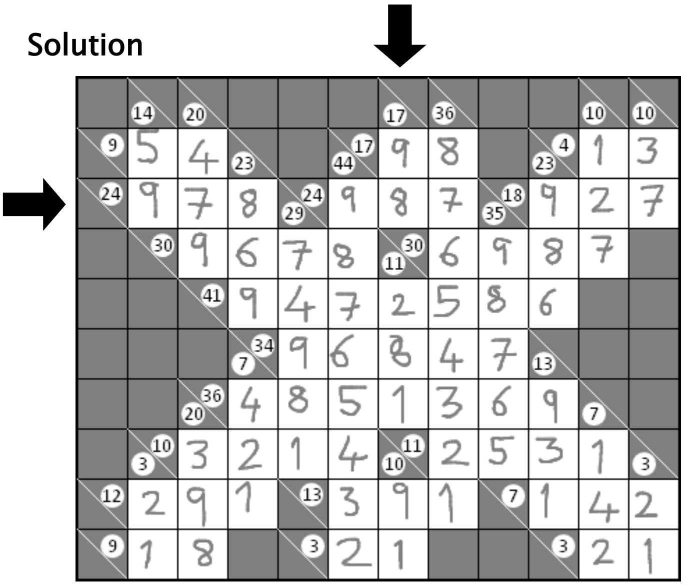
Place a digit from 1-9 in each white cell in the grid so that the sum of each horizontal/vertical group of cells equals the number given on its left/top. Digits must not repeat within any sum.

Answer key: enter the marked row, from left to right, followed by the marked column, from top to bottom. For the example, the correct answer is **978987927, 9828191**.

Example



Solution



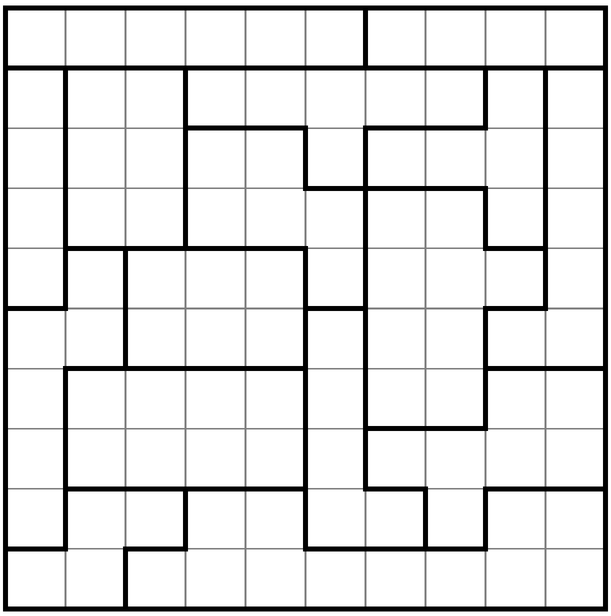
LITS

20 points

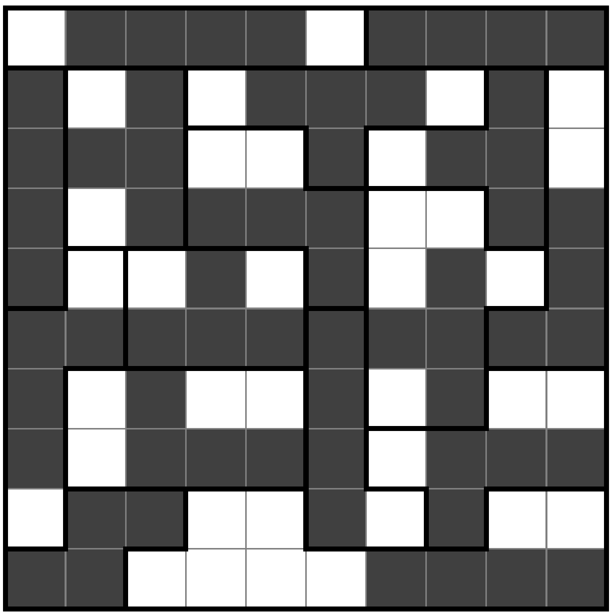
Place exactly one of the four tetrominos (L, I, T and S) in each marked region of the grid by shading in some squares. Tetrominoes of the same type, including both rotations and reflections, must not be adjacent via a common cell-edge. The resulting shaded cells in the grid must form a connected area via horizontal or vertical paths, and there must not be any completely shaded 2x2 area of cells.

Answer key: enter the number of "T" tetrominoes used, followed by the number of "S" tetrominoes used. For the example, the correct answer is **5,1**.

Example



Solution



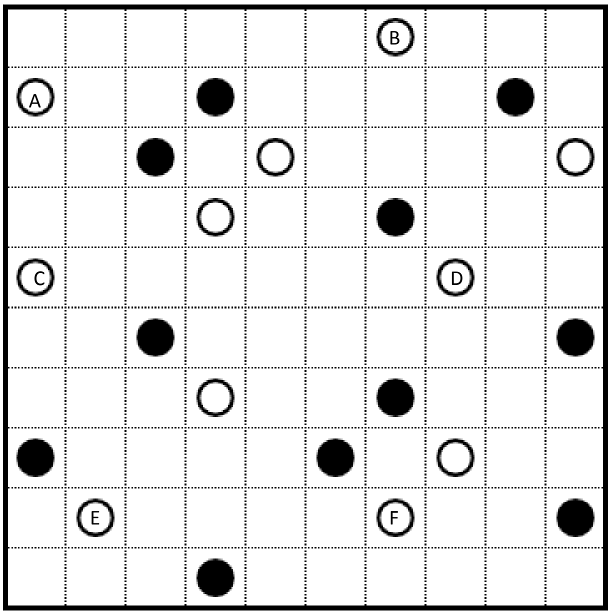
MASYU

20 points

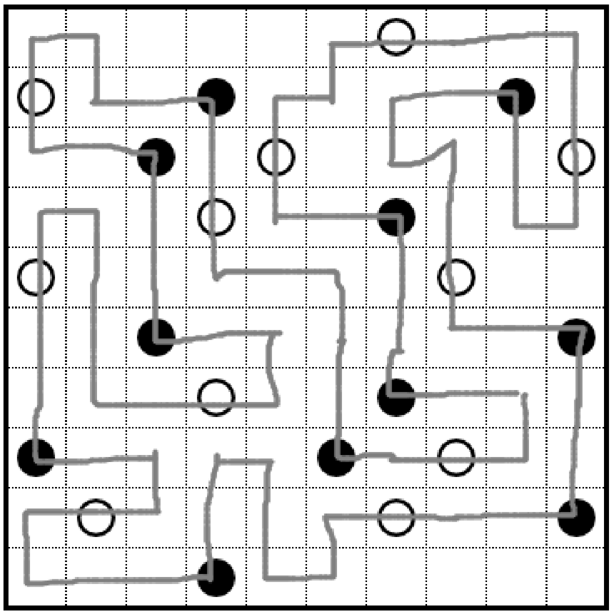
Draw a single closed loop in the grid, travelling horizontally and vertically through the centres of each empty cell it passes through. The loop must not intersect/overlap itself. The loop must also pass through each circle in the grid. At a white circle, the loop must travel straight through and make a 90˚ turn in the cell immediately before or after. At a black circle, the loop must make a 90˚ turn and extend in the relevant two directions for at least two cells.

Answer key: Starting with 'A', and travelling up (clockwise), enter the letters according to the order in which they occur along the loop. For the example, the correct answer is **ABDFEC**.

Example



Solution



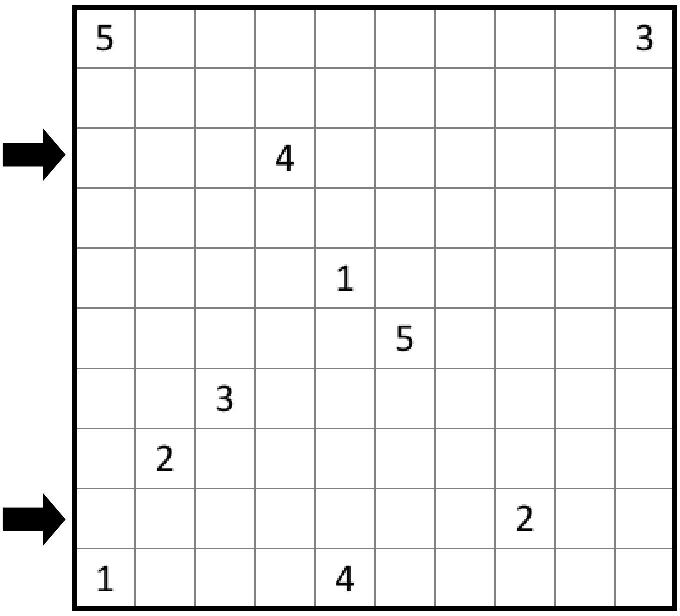
NUMBERLINK

5 points

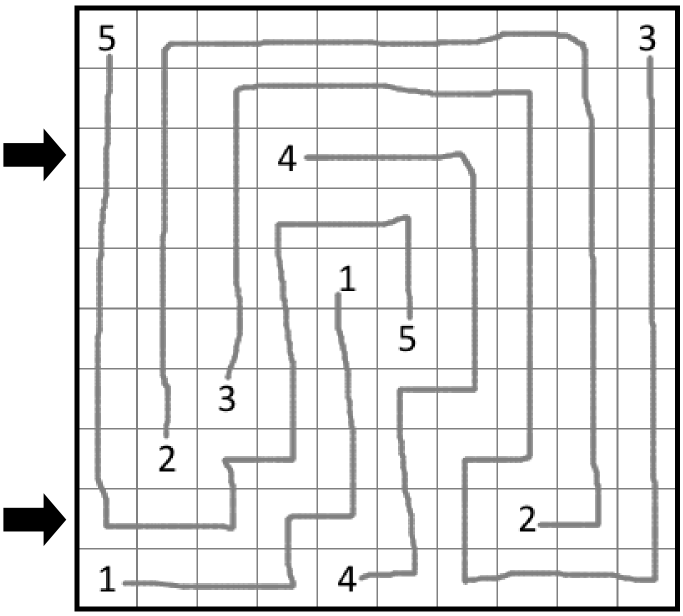
Connect matching pairs of numbers in the grid with a line which travels horizontally and vertically via the centres of each cell it passes through. Any given line must not intersect/overlap itself, or any other line.

Answer key: enter the marked rows, from left to right, using the corresponding number for each cell. For the example, the correct answer is **5234444323,5551143223.**

Example



Solution

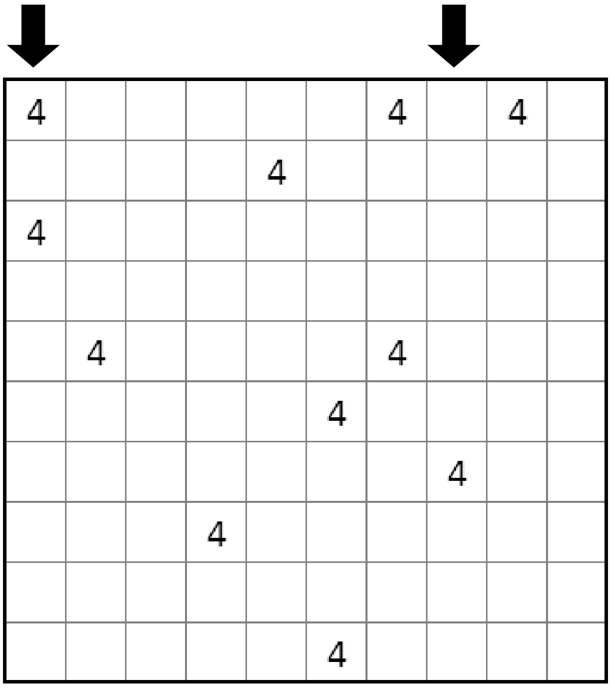


Nurikabe **15 points**

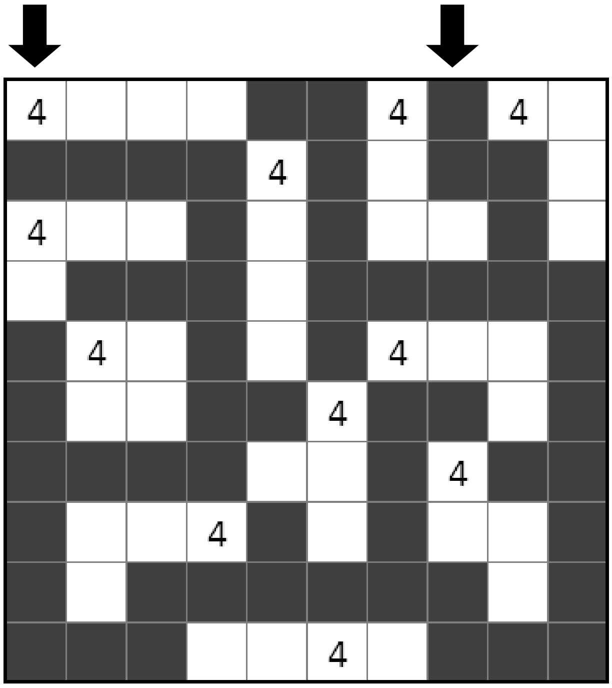
Shade some cells in the grid, such that the shaded cells form a connected area via horizontal and vertical paths, and so that there are no 2x2 area of cells completely shaded. The remaining unshaded cells must form several connected islands. Each island must contain exactly one given number in the grid, and this number represents the number of cells of its corresponding island.

Answer key: enter the marked columns, from top to bottom, using ‘0’ for an unshaded square and ‘1’ for a shaded square. For the example, the correct answer is 0100111111,1101010011.

Example



Solution



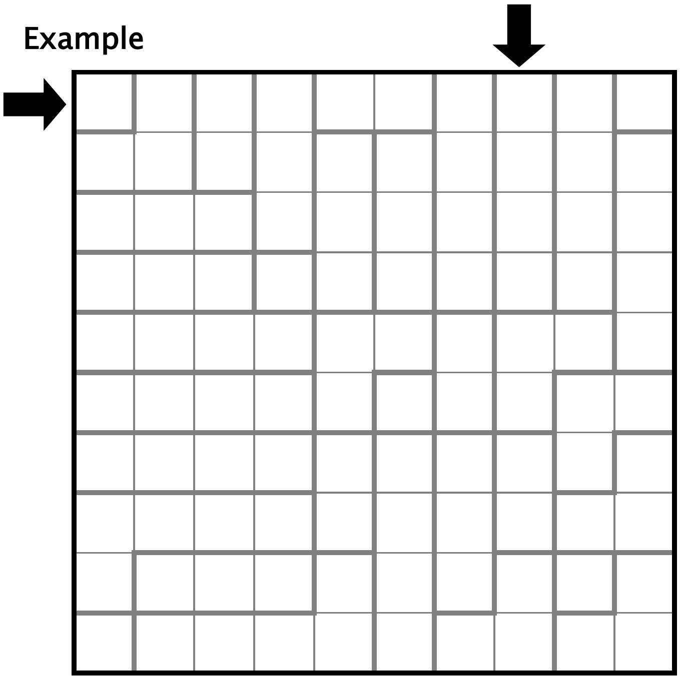
RIPPLE EFFECT

20 points

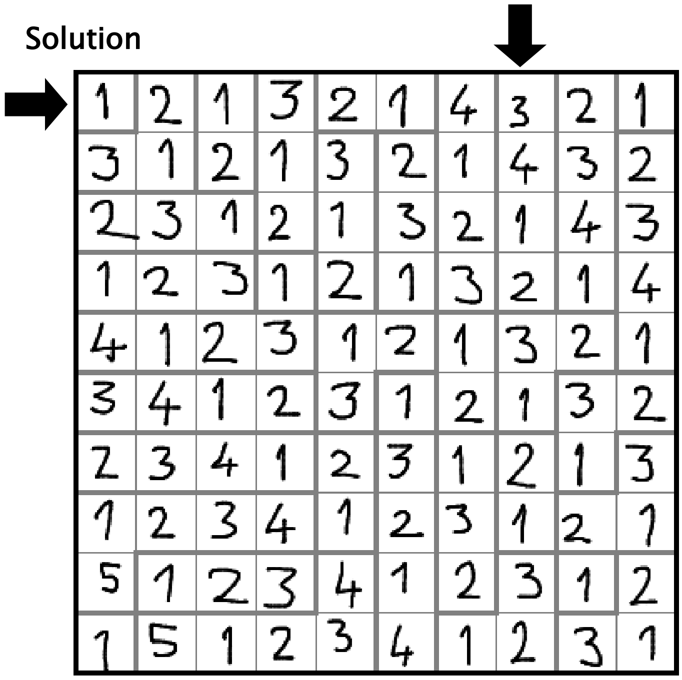
Place a number in each cell in the grid. The grid is divided up into several regions, and each region must contain the numbers 1–*n* exactly once, where *n* is the number of cells in a given region. Any given number *m* in the grid must be at least *m* cells away in a horizontal or vertical direction from any other instance of *m* in the grid.

Answer key: enter the marked row, from left to right, followed by the marked column, from top to bottom. For the example, the correct answer is 1213214321,3412312132.

Example



Solution



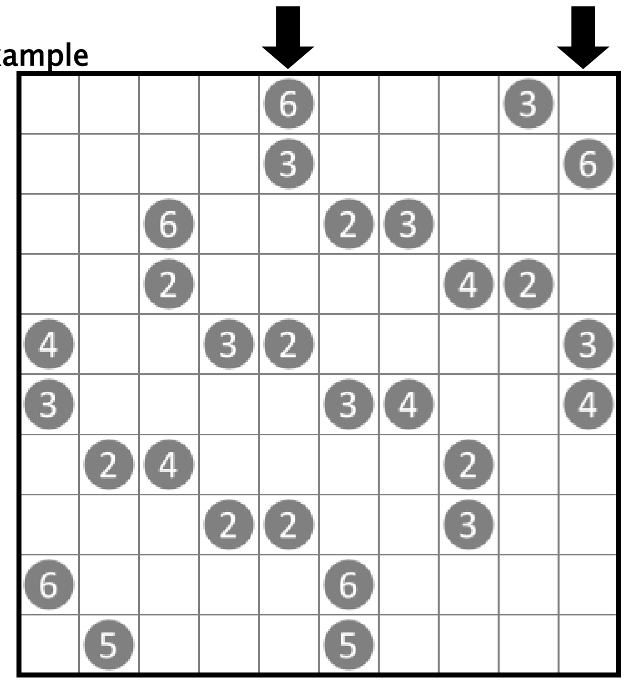
SHIKAKU

25 points

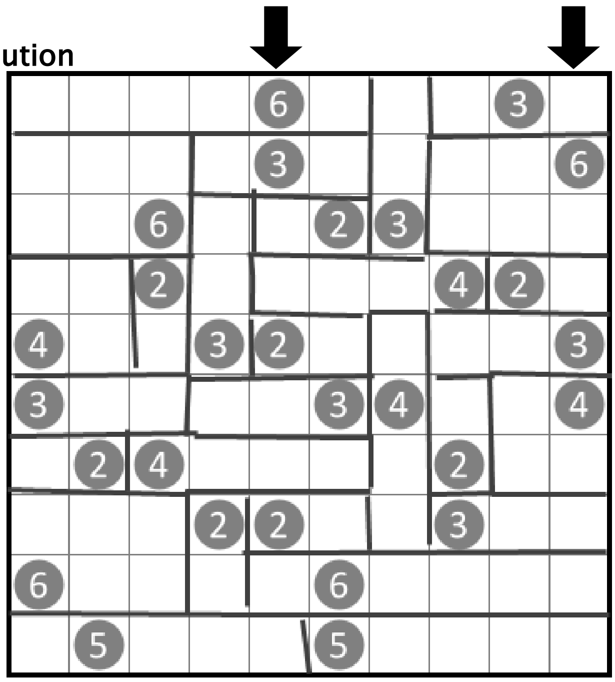
Divide the grid into rectangles so that each rectangle contains exactly one number. Each number represents the number of cells of its corresponding rectangle.

Answer key: for each marked column, enter from top to bottom the corresponding size of rectangle each cell belongs to. For the example, the correct answer is 6324234265,3662344365.

Example



Solution



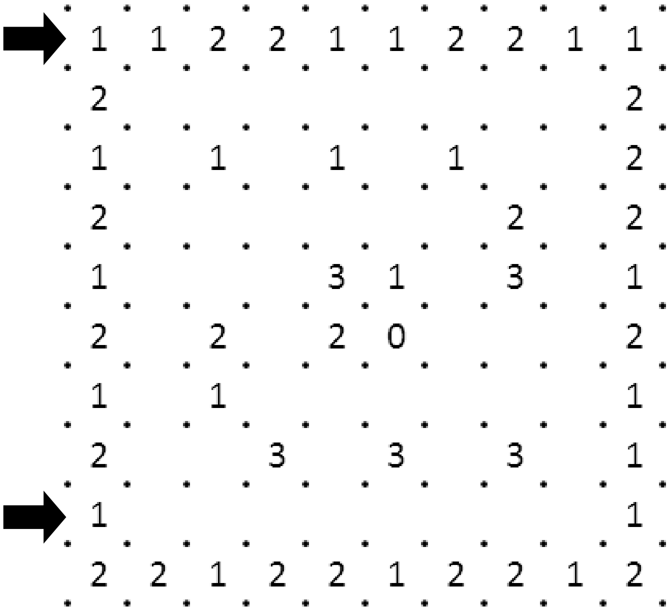
SLITHERLINK (FENCES)

10 points

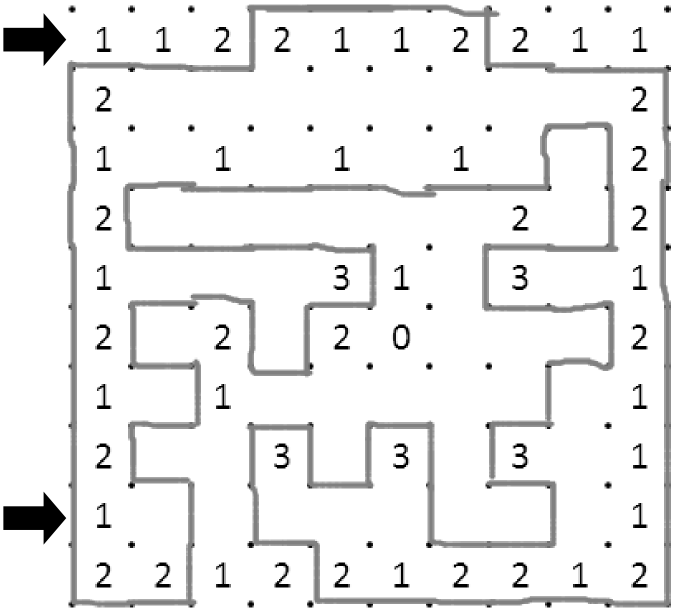
Draw a single closed loop in the grid, travelling horizontally and vertically between the lattice points. The loop must not intersect/overlap itself. Numbers in some cells of the grid indicate how many edges of that cell are contained in the loop.

Answer key: enter the number of cells inside the loop in each marked row.
For the example, the correct answer is **4,7**.

Example



Solution



SUDOKU

15 points

Place a number from 1-9 in each empty cell in the grid such that each row, column and marked 3x3 box contains each number exactly once.

Answer key: enter the marked row, from left to right, followed by the marked column, from top to bottom. For the example, the correct answer is **841653297,642985137**.

Example

		6	3	2				
		8	5	6		1	7	
						4	2	
	1	5				7	3	
	7	9						
	6	7		8	9	5		
				4	1	8		

Solution

7	2	4	9	1	8	3	5	6
1	5	6	3	2	7	9	8	4
9	3	8	5	6	4	1	7	2
6	8	3	1	7	5	4	2	9
2	1	5	4	9	6	7	3	8
4	7	9	8	3	2	6	1	5
3	6	7	2	8	9	5	4	1
5	9	2	7	4	1	8	6	3
8	4	1	6	5	3	2	9	7

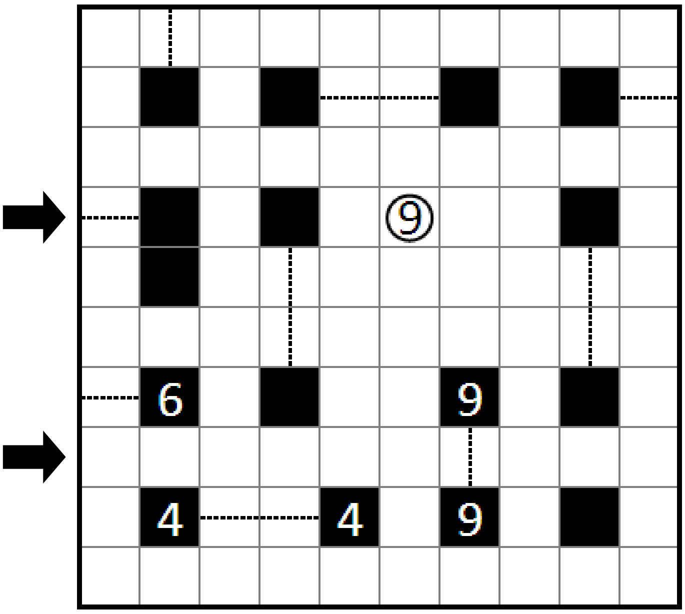
SURAROMU (SLALOM)

20 points

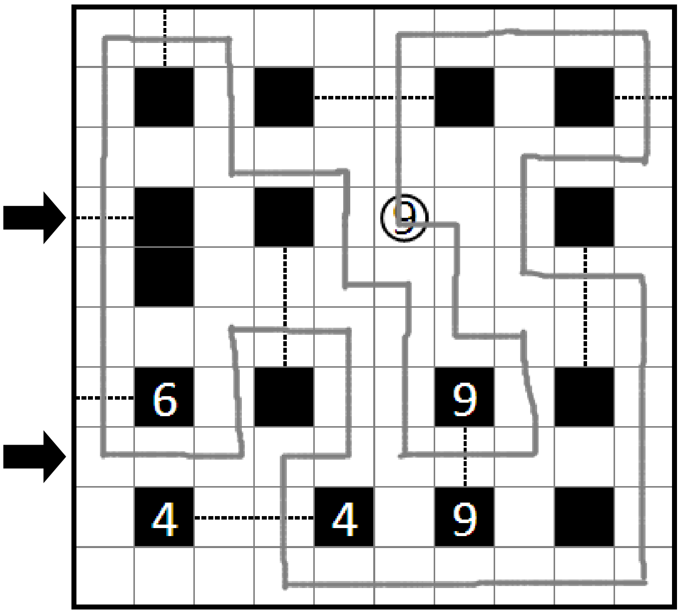
Draw a single closed loop in the grid, travelling horizontally and vertically though the centres of the cells it passes through. The loop must not intersect/overlap itself. The loop begins (and ends) at the circled number, and travels perpendicularly through each of the dotted gates exactly once. The gates are labelled in the order that the loop passes through. The circled number indicates the total number of gates.

Answer key: enter how many times the loop makes a 90˚ turn in each of the marked rows. For the example, the correct answer is **2,6.**

Example



Solution



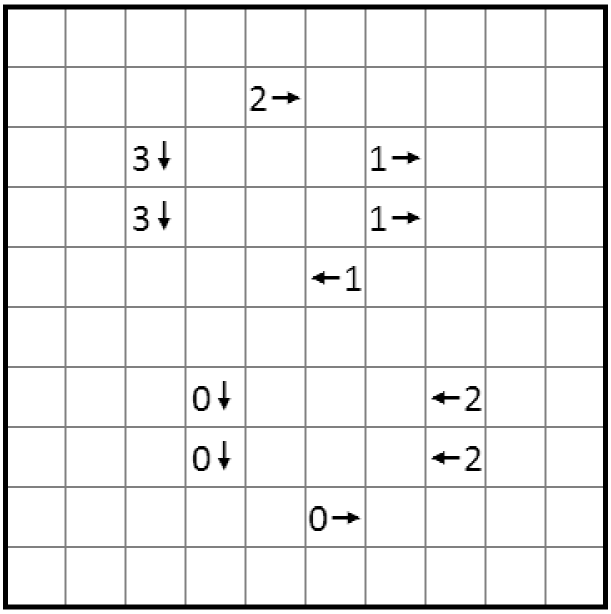
YAJILIN (ARROW RING) **20 points**

Draw a single closed loop in the grid, travelling horizontally and vertically through the centres of each empty cell it passes through. The loop must not intersect/overlap itself.

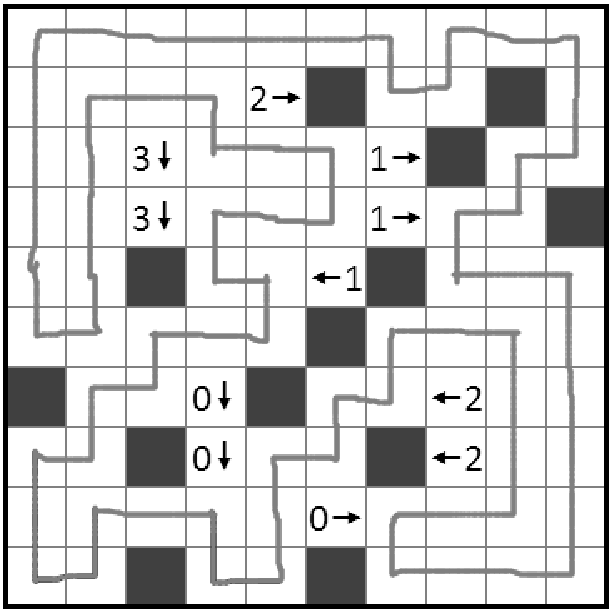
Any empty cell the loop does not pass through must be shaded in. Shaded cells must not share an edge. Some cells have numbered clues; these indicate how many cells in the given direction are to be shaded.

Answer key: enter the number of shaded squares in each row, starting with the top row. For the example, the correct answer is 0211212202.

Example



Solution



YAJILIN MARATHON PUZZLE – IMPORTANT:

The answer key for the marathon yajilin puzzle will be different from the yajilin in the main section. For the marathon puzzle, the following answer key will be used:

Answer key: enter how many times the loop makes a 90˚ turn in each of the marked columns.