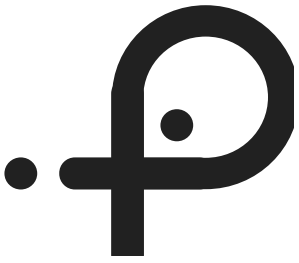
Puzzle Submissions for
Puzzle Innovation Contest

(http://wspc2017.logicmastersindia.com/forum/forums/thread-view.asp?tid=1390)



26th WPC
INDIA 2017

Puzzle Innovation Contest

Puzzle Innovation Contest was held at Logic Masters India with an aim to increase the pool of innovation for World Sudoku and Puzzle Championship 2017, and also to recognize the best innovations and innovators. Check details at http://wspc2017.logicmastersindia.com/forum/forums/thread-view.asp?tid=1390.

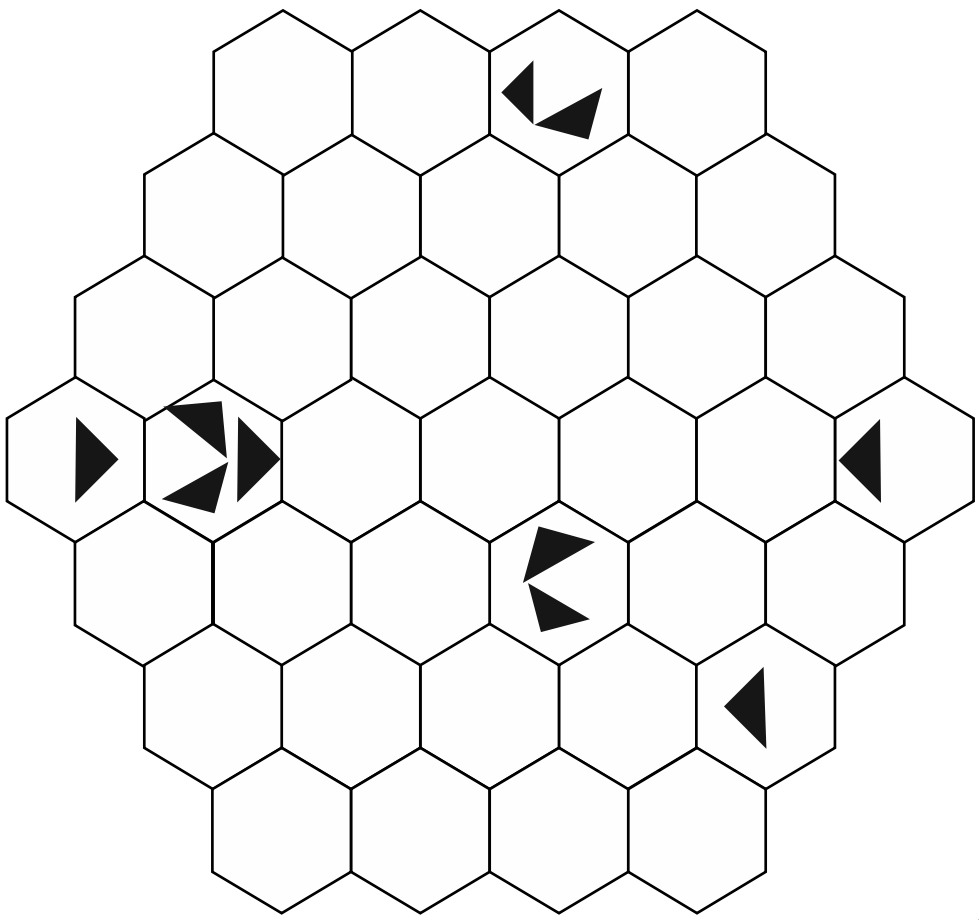
We received as many as 49 submissions for Puzzle ideas, with many promising ones, out of which some will be used in World Puzzle Championship – 2017.

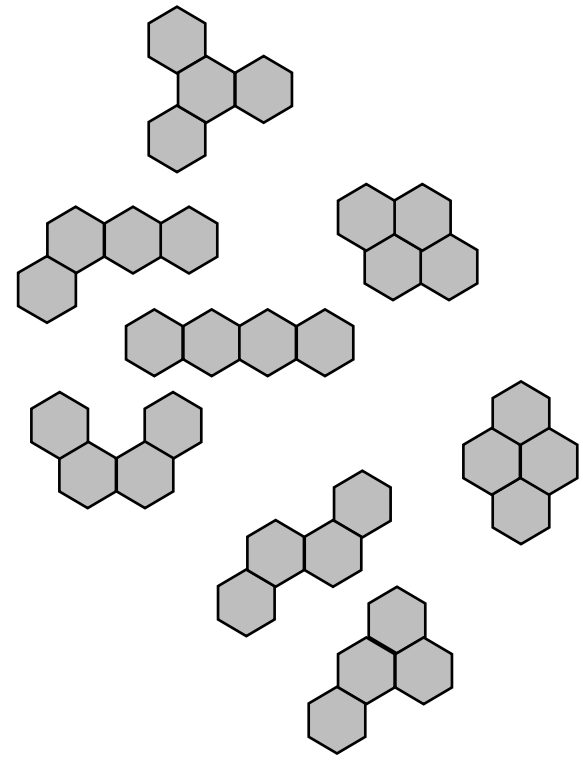
Here is the complete list, sorted alphabetically by authors' names. Some submissions have been removed because they failed to adhere to this basic rule mentioned within the contest announcement: We are looking only for original ideas in puzzle types, and ideas of new variations in Sudoku, which have not been seen elsewhere to the best of the author's knowledge

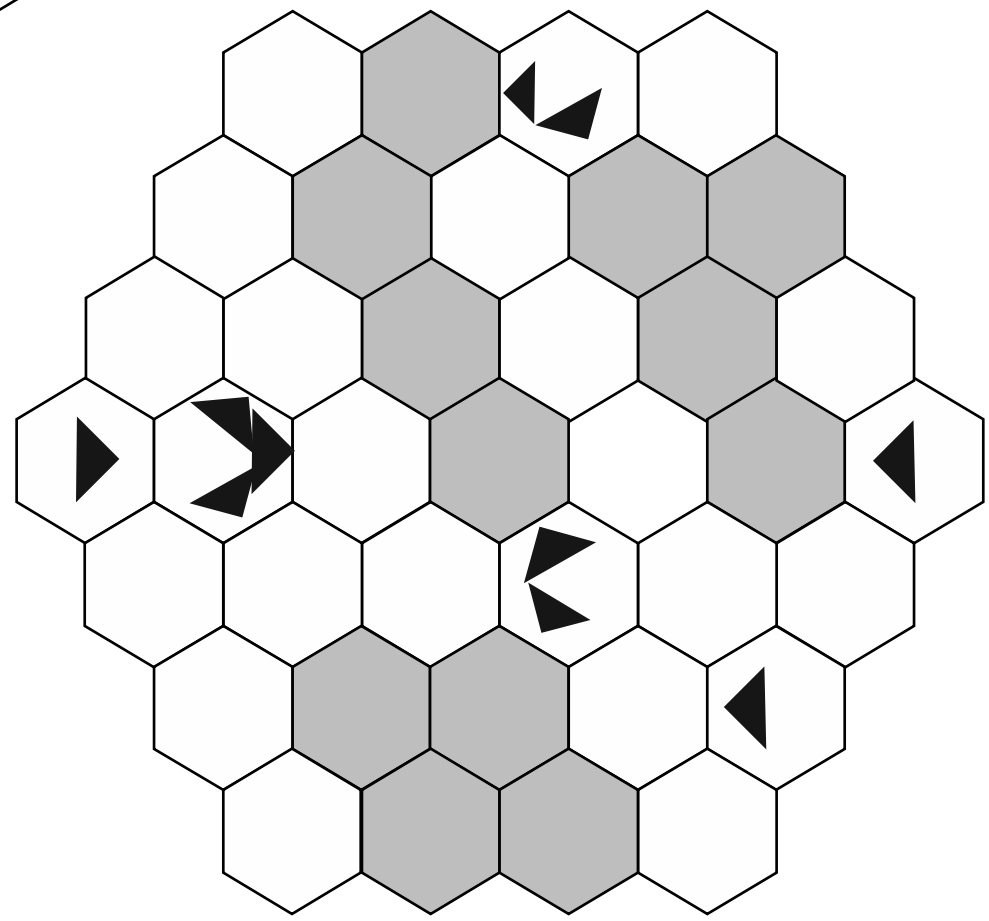
Anurag, INDIA	6D Vision Airy Rooms Collision Course Confined Loop Cross Country Hike Discerning Loop Double Ripple Loop Full Robots Heterogeneous Loop Hidden Figures Informed Snake Interstellar Voyager 3 Knights in Pentarmour Largest Number Lonely Signposts Longest Path Meddling Spaces Migration	Nonconsecutive Loop Optimal Pentomino Wall Pentomino Arms Pentomino Street Pentopa Point and Place Rectangular Numbers Ripple Loop Separator Loop Shaded Jigsaw Space Odyssey Species Succession Loop Transcombinator Transpenta Wide Angle View X on Both Sides
Dan Adams, USA	Spatial Tangrams Watch Towers Labyrinth Grapevine Pentomino word search	Shards Carousel Loop Swirl Bossa Cave Snowflakes
Ivan Koswara, INDONESIA	Maximal Archipelago	
Nikola Živanovic, SERBIA	Word String	Falling Letters
Rauno Pärnits, ESTONIA	Kashmir Carpet	

6D VISION

Place some of the tetrominoes(eight shapes exist) in hexagonal grid, with rotations/reflections allowed. Clue cells must be empty. Arrows indicate all the directions(up to 6) where the closest tetromino part is located. Tetrominoes cannot touch each other.



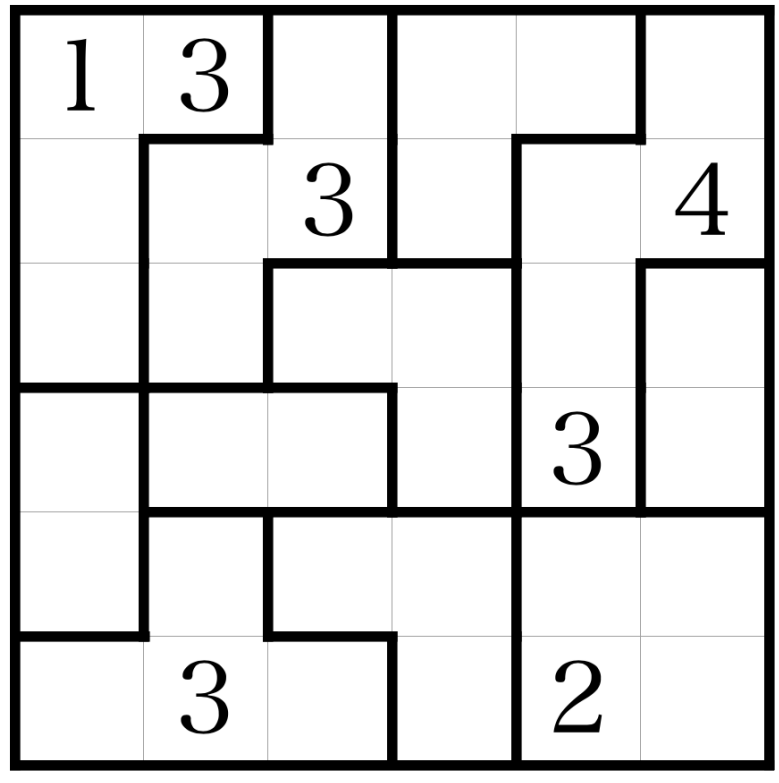


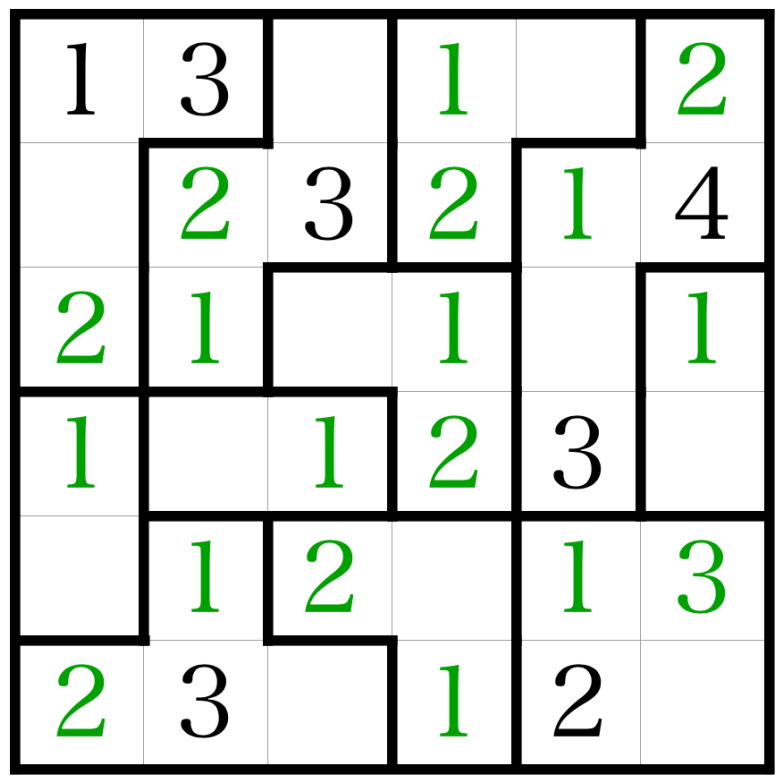


Submitted by Anurag

AIRY ROOMS

Place at least one number, and leave at least one cell empty, in every bold outlined region. Numbers in every region are all consecutive and start with 1. All numbers in the grid must form a single connected group. No two adjacent cells can both be Empty. No two adjacent cells can contain the same number.

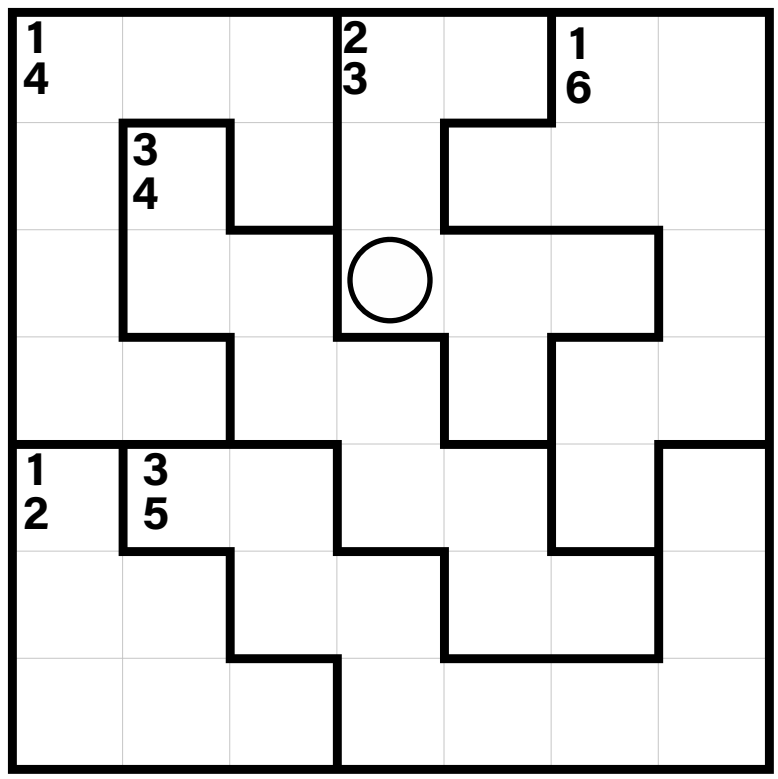


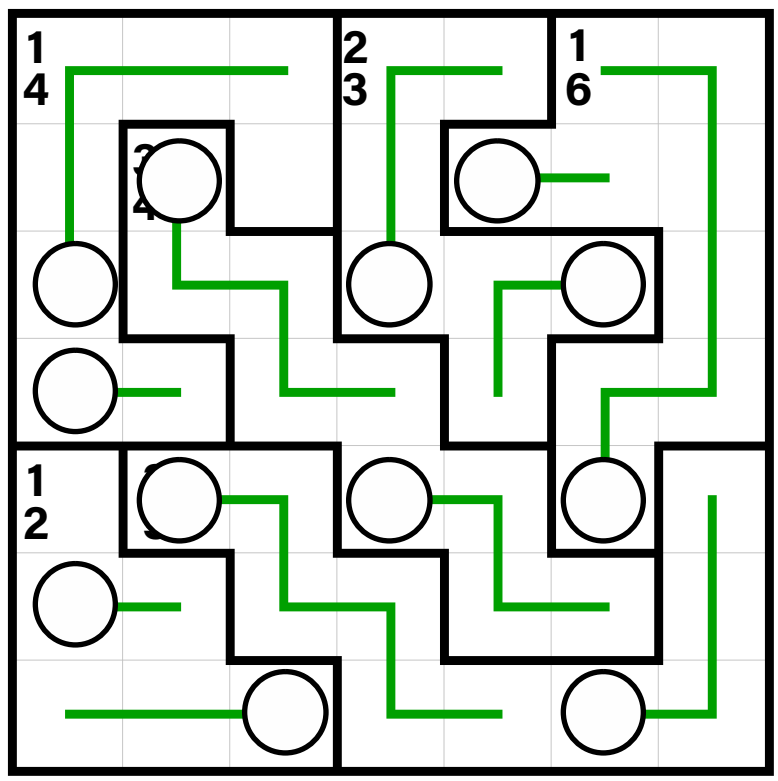


Submitted by Anurag

COLLISION COURSE

Place two balls in each outlined region. Then roll each ball, one region at a time, through the edges horizontally or vertically, for a distance equal to one of the numbers given in its region(every number corresponds to a different ball). The balls cannot go outside their region, and their paths have to be non-overlapping. Balls from different regions cannot be placed horizontally or vertically adjacent to each other. A ball cannot collide with ball from another region(the latter staying in its original position), if it were to continue rolling until the edge of the grid without changing direction. Locations of Some balls may already have been given.

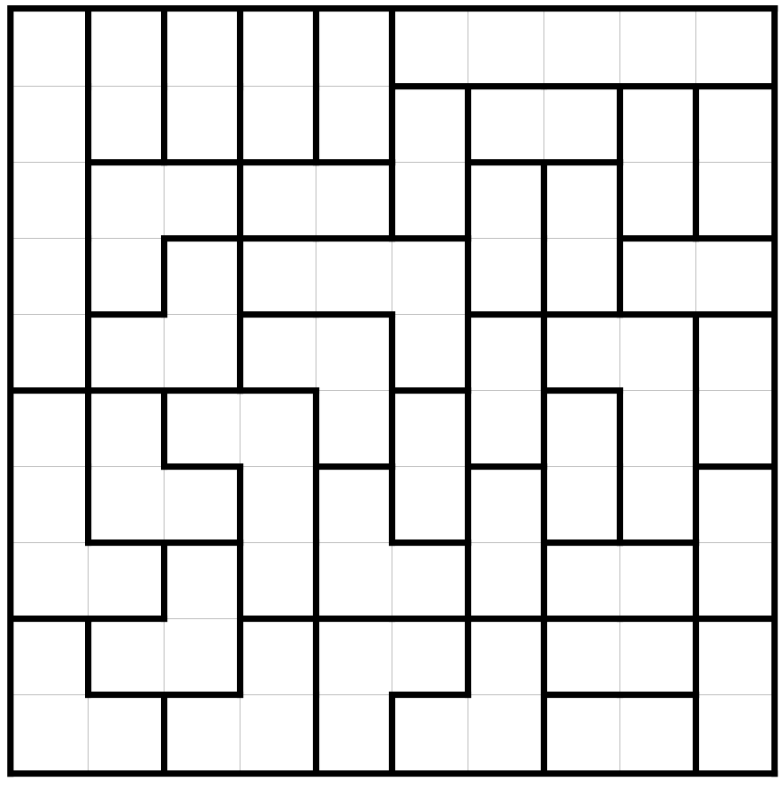


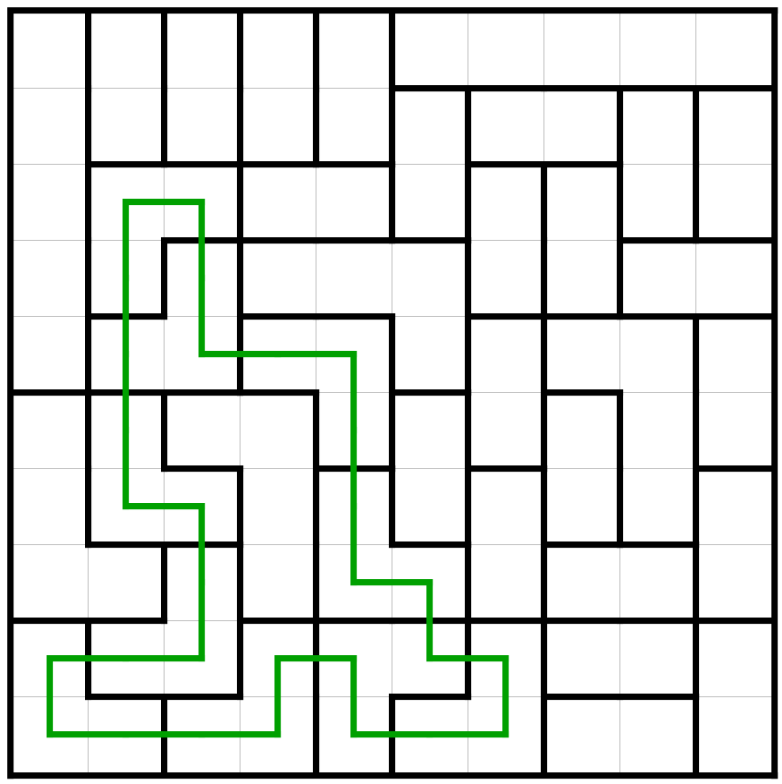


Submitted by Anurag

CONFINED LOOP

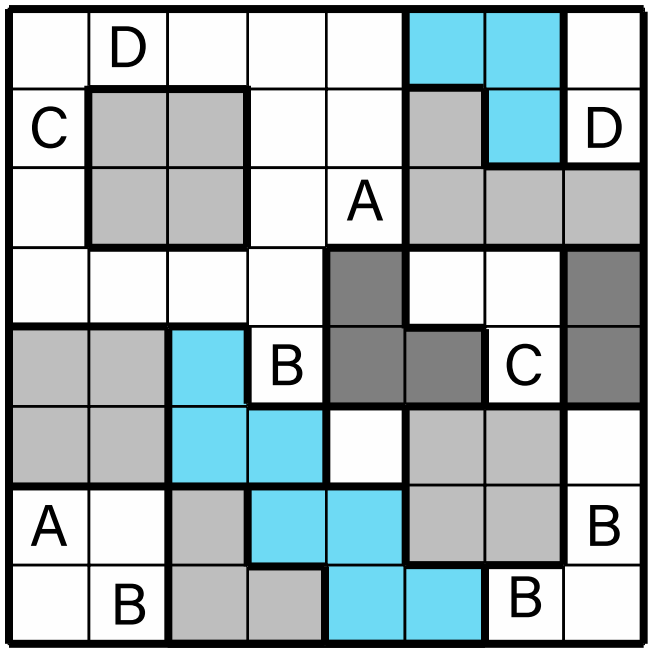
Draw a single closed loop that connects the centres of some cells horizontally or vertically. The loop may not cross itself or branch off. The grid is divided into polyominoes- dominos, triminoes, tetrominoes, and so on. The loop must pass through only one type of polyomino, and must visit all the occurrences of that polyomino.





CROSS COUNTRY HIKE

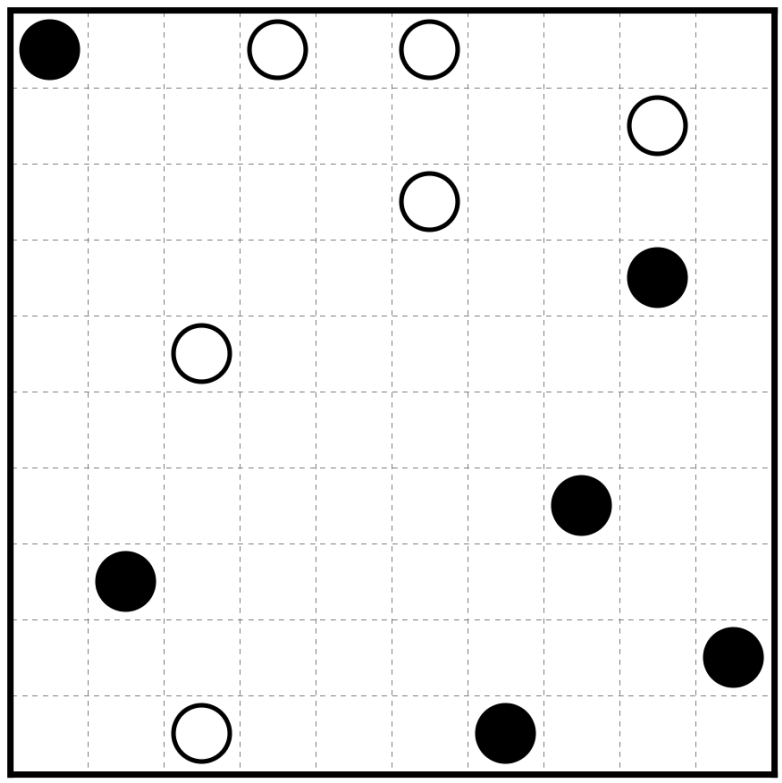
Connect pairs of same letters with lines that pass horizontally or vertically through the centres of cells. Every path starts and ends in a letter. Every path visits the entirety of at least one country (bold outlined region). The paths cannot visit any country partially. The paths always enter and leave a country exactly once. Paths cannot cross themselves or other letters.

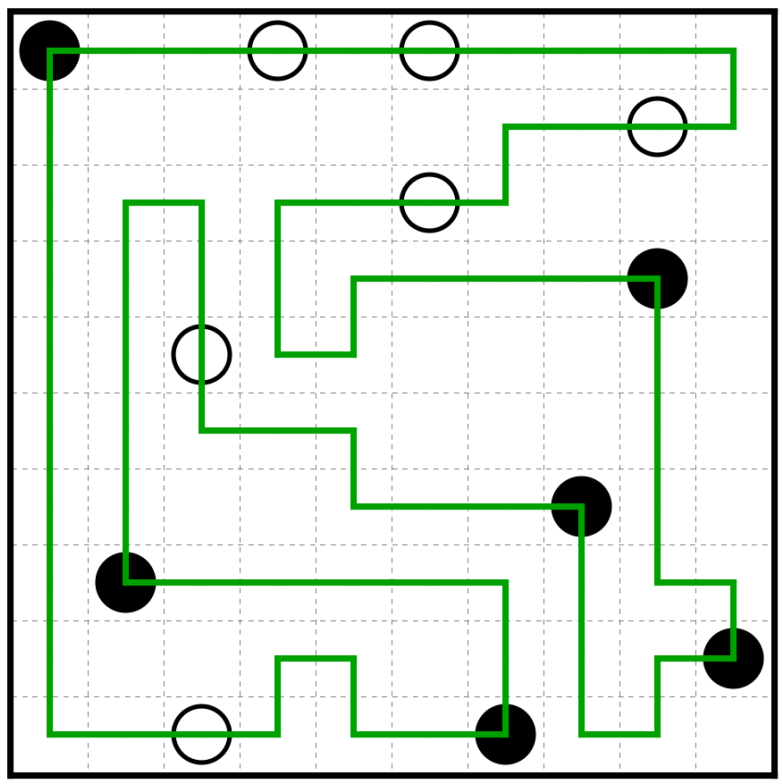


Submitted by Anurag

DISCERNING LOOP

Draw a single closed loop that connects the centres of cells horizontally or vertically, but does not necessarily visit all cells. The loop may not intersect itself, and visits all circles. The loop must turn in every black circle, and go straight through every white circle. Loop segments on both sides of a black circle must be of equal length before turning, and this length must be different for every black circle. Loop segments on either side of a white circle must be of different lengths.

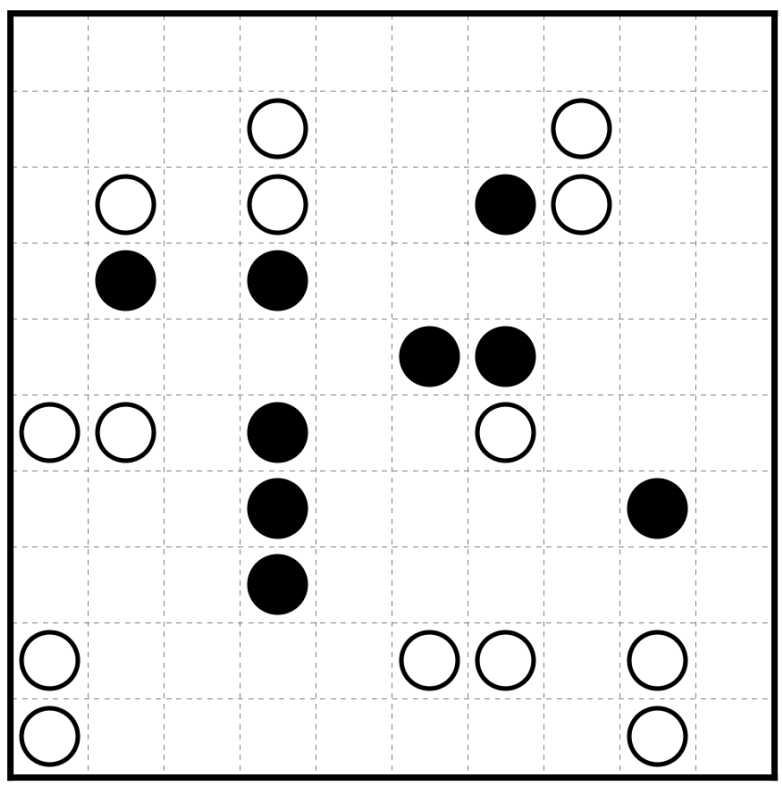


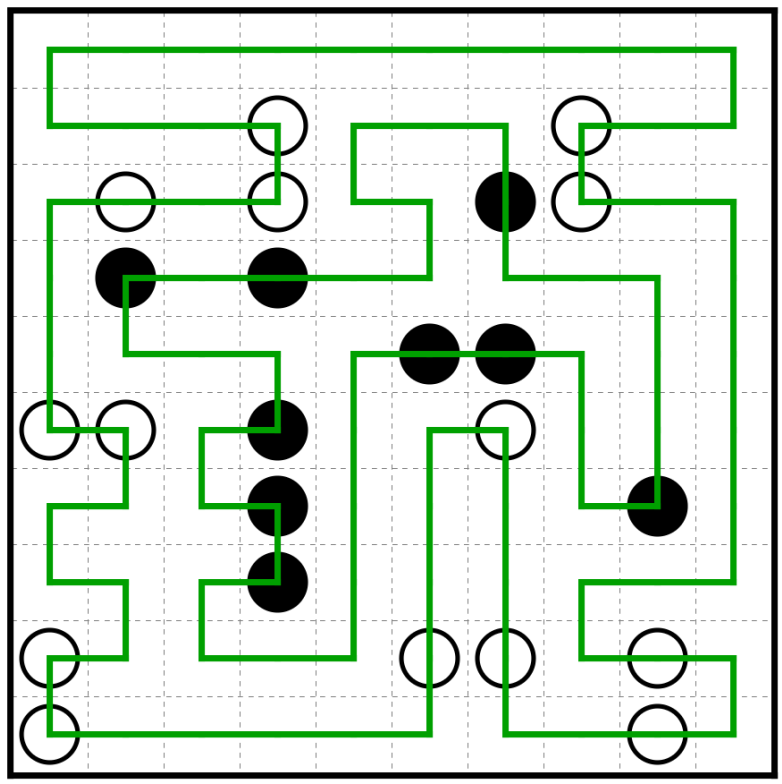


Submitted by Anurag

DOUBLE RIPPLE LOOP

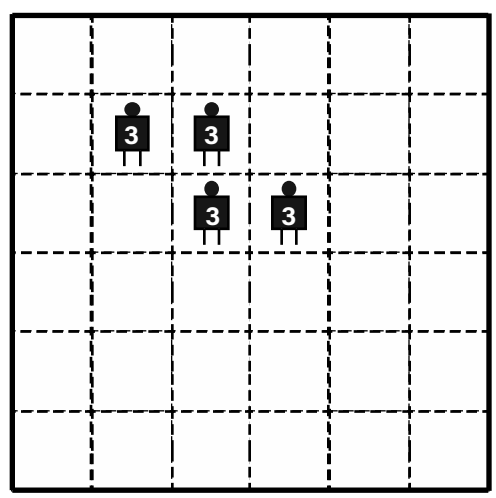
Draw two closed loops that connect the centres cells horizontally or vertically. Between them, the loops visit all cells exactly once. One loop visits white circle only, and the other loop visits only the black circles. When two circles of opposite colours are edge-adjacent, the loop must go straight through one, and make a right angle turn in the other. When two circles of the same colour are edge-adjacent, the loop must either turn in both, or go straight through both.

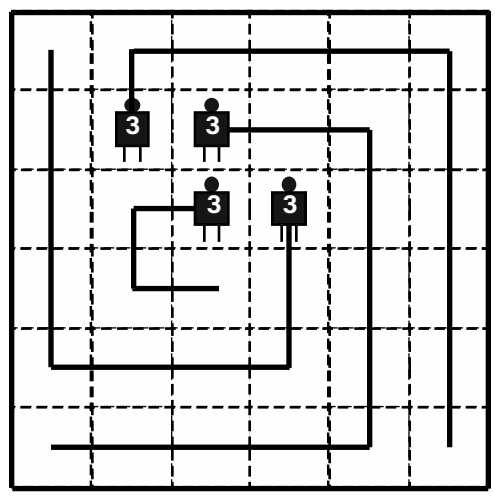




FULL ROBOTS

Four robots are located in the grid. Trace a path connecting the centres of cells starting at each robot that does not intersect or overlap itself or other robots' paths. The four paths must together visit all empty cells. Every path must start in a unique direction-North/west/south/east. The paths can turn a maximum of 3 times, each time in a different direction, and can traverse any number of cells before every turn. Number written in a robot indicates how many directions it takes.

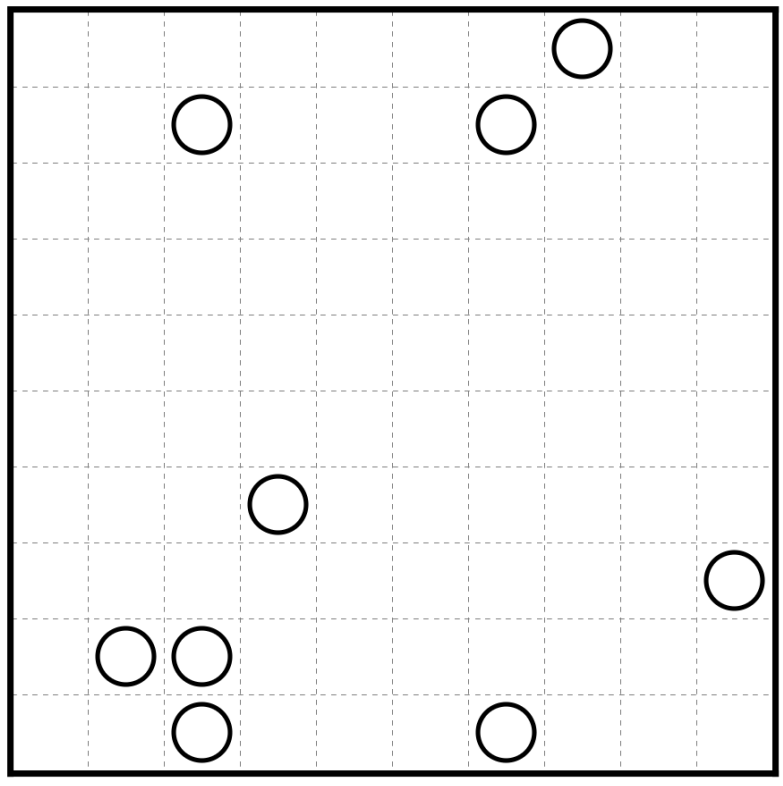


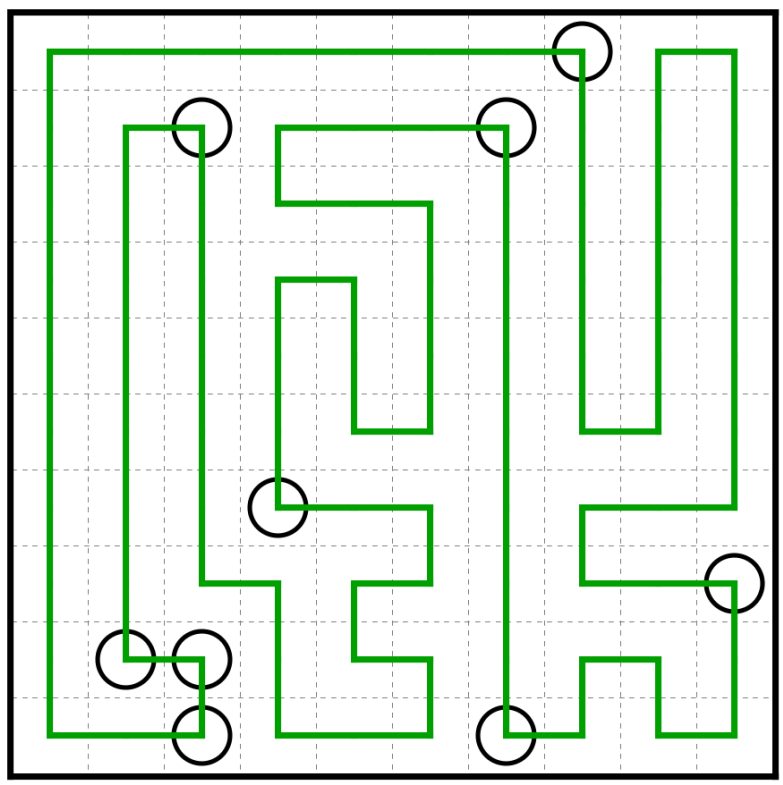


Submitted by Anurag

HETEROGENEOUS LOOP

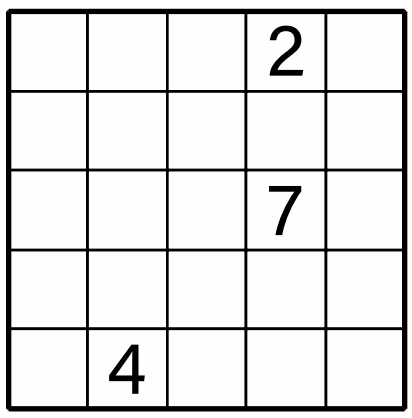
Draw a single closed loop that connects the centres of some cells horizontally or vertically. The loop may not cross itself or branch off. The loop must turn in every circle. For each circle, the sum of lengths of segments connecting the circle on either side has to be different.

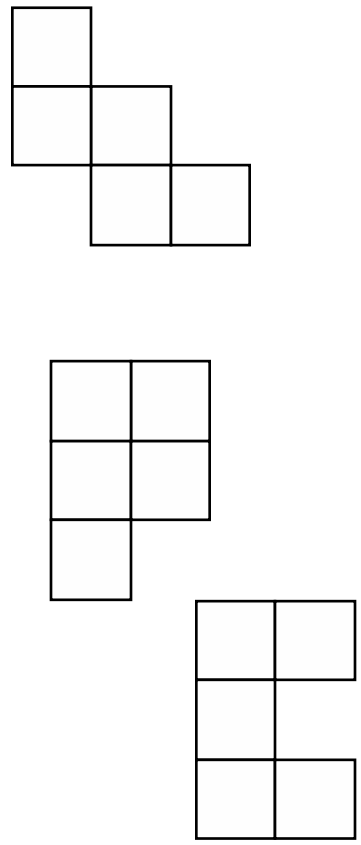


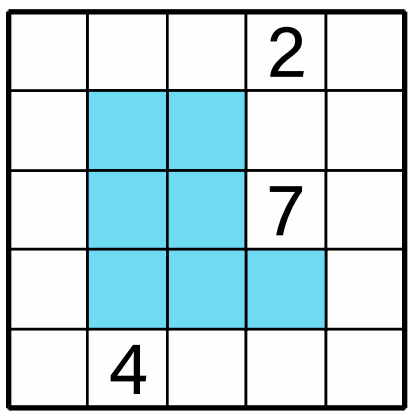


HIDDEN FIGURES

Place the given figures once each, without rotations and reflections. Figures may overlap. Numbers indicate how many of the surrounding cells are occupied. If a cell is occupied by multiple figures, it is counted as many times. Clue cells must remain empty.



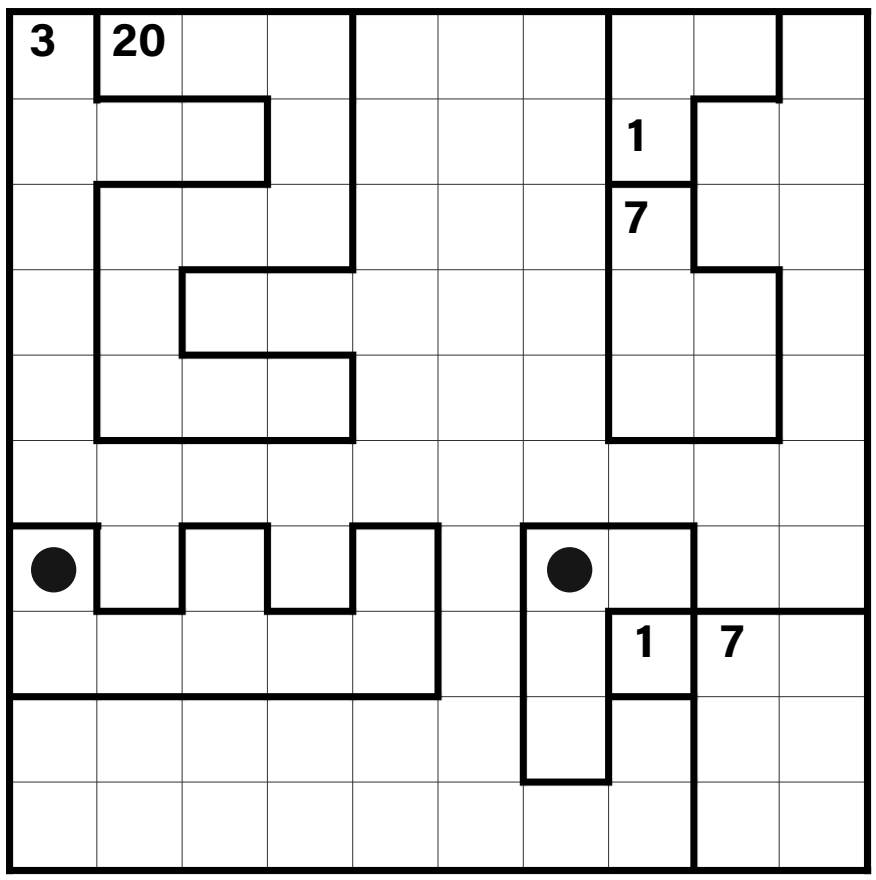


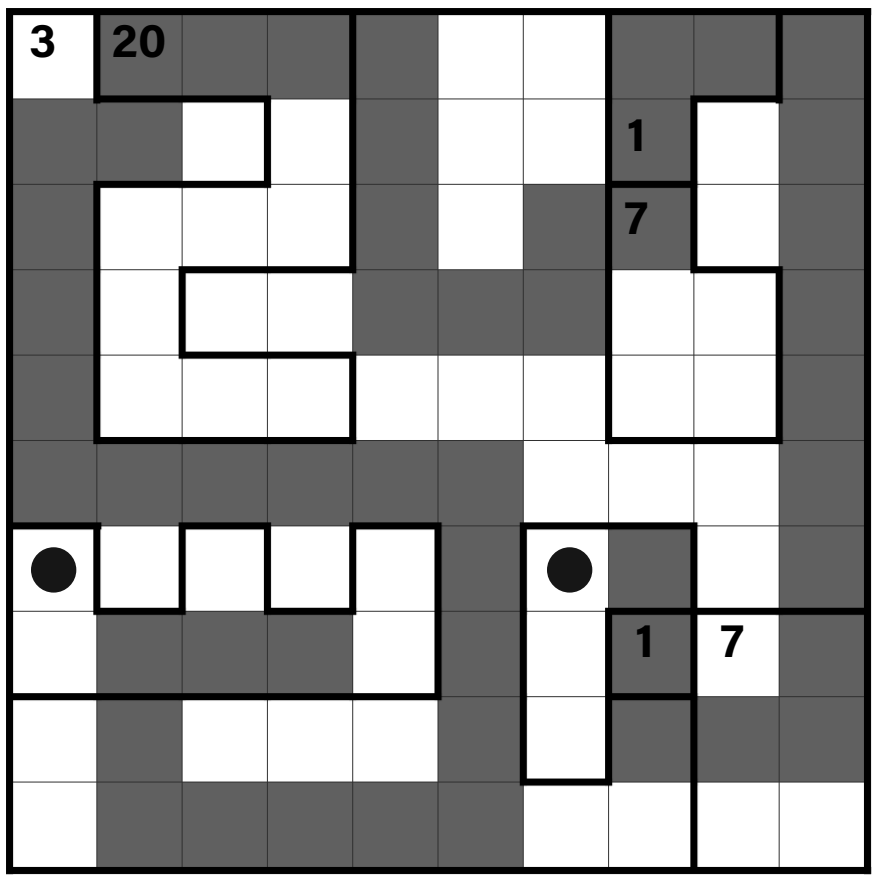


Submitted by Anurag

INFORMED SNAKE

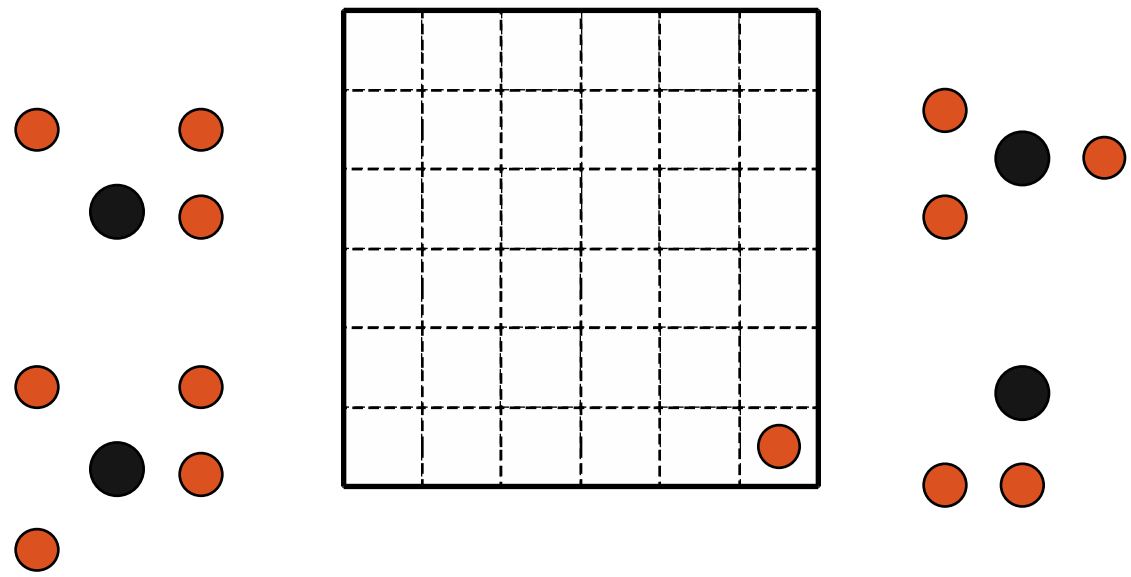
A snake of one cell width is hidden in the grid. The snake's head and tail must be located in the shaded rooms. The snake may not touch itself, not even at a corner. The snake's path has a defined direction. Each time the snake enters a room that has a given number, the snake would have occupied exactly the same number of cells in the room that immediately preceded along the path. All outlined rooms must be visited by the snake at least once.

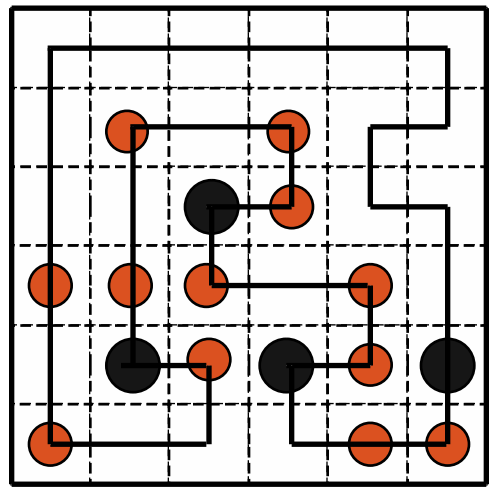




INTERSTELLAR VOYAGER 3

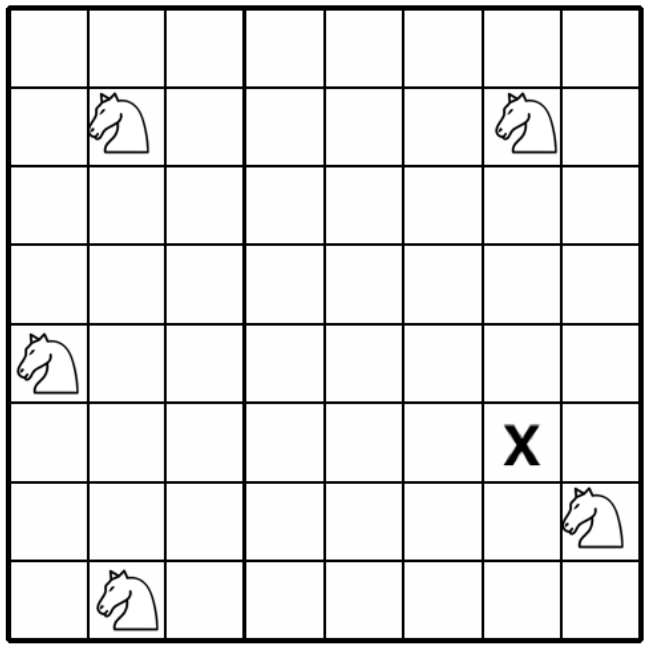
Interstellar voyager 3 is on a mission to a multinary star system. Every star system consists of a star, and its child planets in the upto eight surrounding cells. Place each given star system, without rotating or reflecting, such that the planets do not overlap, though the empty space of the systems may overlap. Then trace the voyager's path through the grid cells horizontally or vertically. The path has a constant defined direction. The path must visit each system in the entirety and may not move out of the system (3x3 square) before completing the visit. Also, the path must follow the same sequence at every system - all planets, then their parent star.

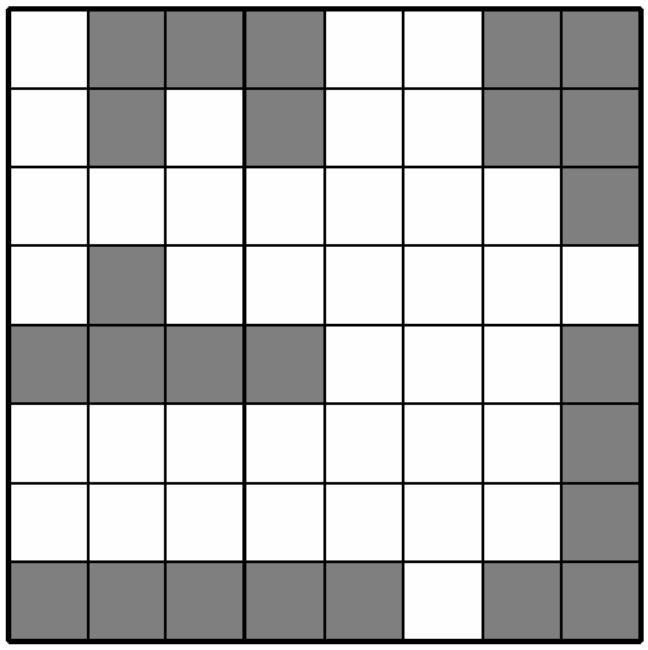




KNIGHTS IN PENTARMOUR

Place as many pentominoes as there are clues in the grid, each clue corresponding to a different pentomino. Pentominoes cannot touch each other horizontally or vertically. The grid is a chessboard, and every cell occupied by pentominoes is the location of a knight. No two knights belonging to different pentominoes may be in attacking positions. If a cell contains 'X', it must be empty.



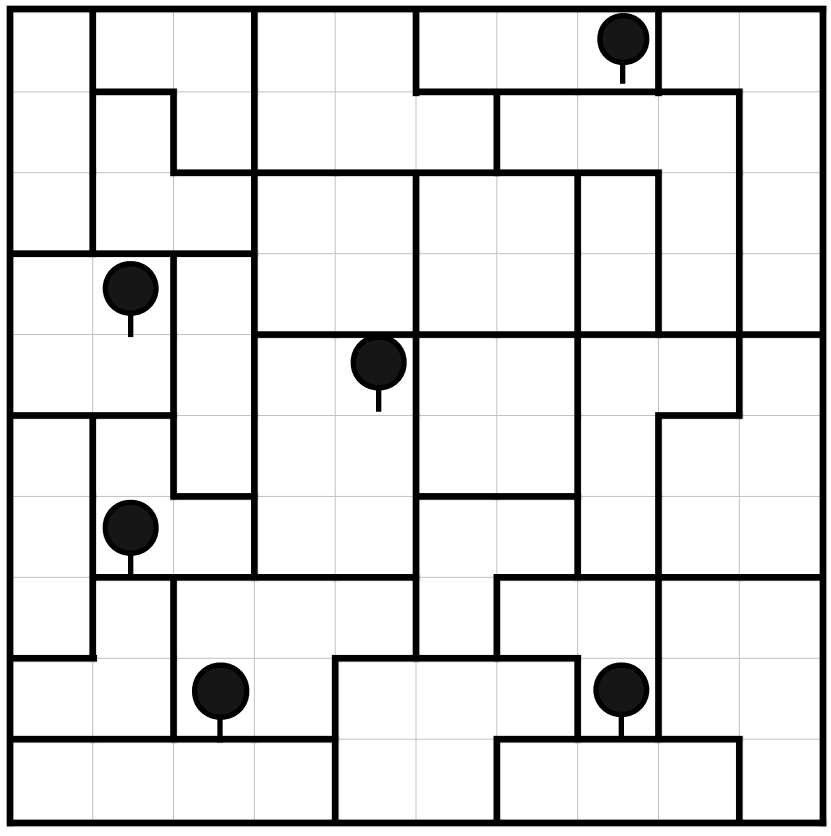


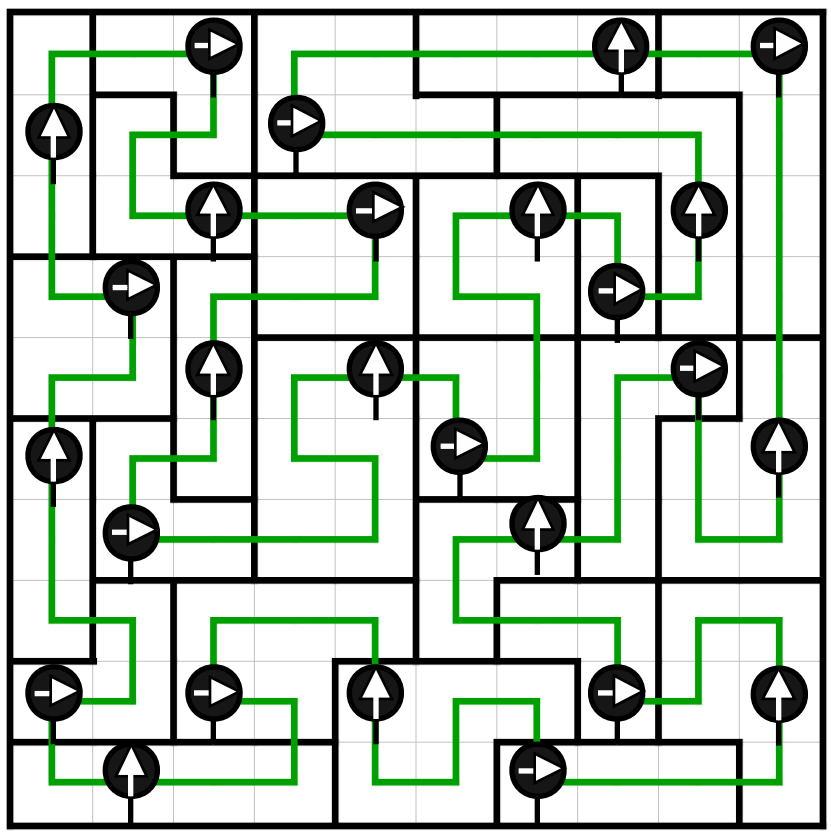
Submitted by Anurag

LONELY SIGNPOSTS

Place only one 'turn here' signpost in half of the regions, and only one 'go straight' signpost in the rest. No two Signposts may not be located in cells that are edge-adjacent. Then draw a single closed loop that connects the centres of all cells horizontally or vertically, and enters and exits every town (outlined region)exactly once. The loop may not cross itself or branch off. The loop must turn in a 'turn here' signpost, and go straight through the other signpost. Some unlabelled signposts may already be given.

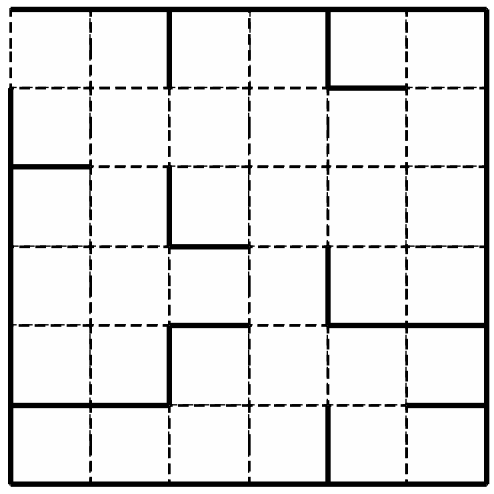
The loop must alternate between black and white signposts.

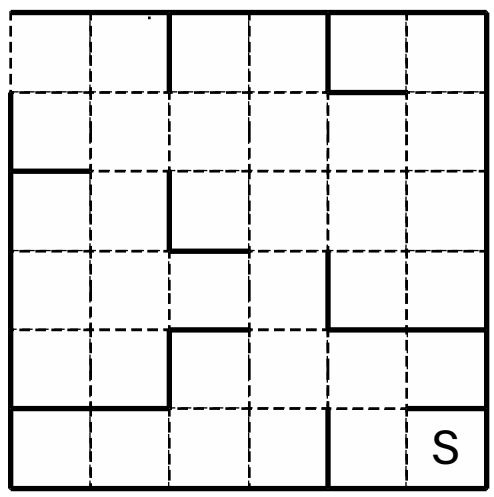




THE LONGEST PATH

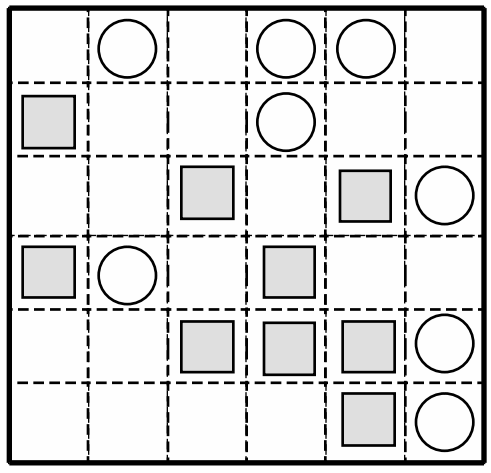
Paths in given maze start by taking any of the four directions. Every next move is in either of two directions upon reaching a dead end(grid edge or maze walls). Turning 180 degrees backwards is not allowed. Find the one starting point from where the shortest possible path to the exit is longest among all starting points. Maze has one exit point defined. Path cannot turn before reaching a dead end.

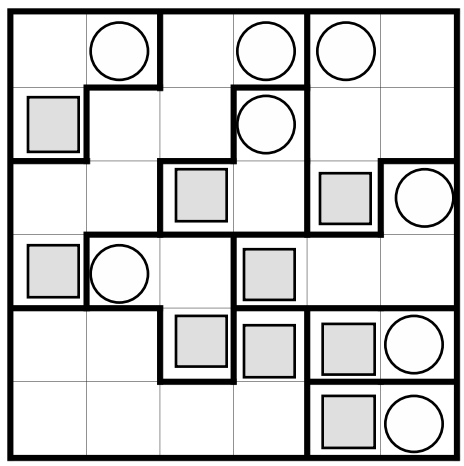




MEDDLING SPACES

Divide the grid along the gridlines into regions of any size greater than 1 (every region is a polyomino at least 2 squares in area).
Each region must contain at least one symbol.
If a region contains two or more symbols, all those symbols must be different.
If two empty cells are orthogonally adjacent, they must belong to the same region.

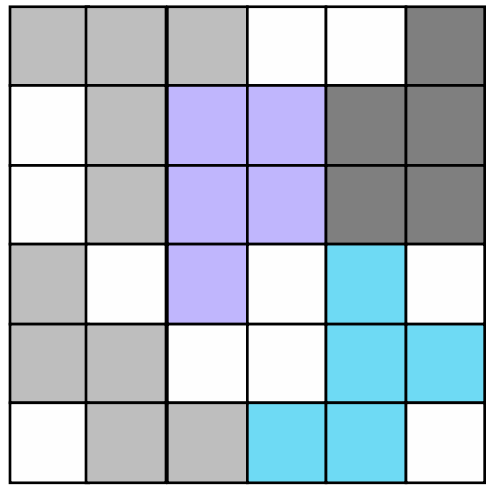




MIGRATION

Slide each of the figures to reach a state where all empty cells are now occupied. Each figure can slide any distance, but in only one of the four horizontal and vertical directions. Figures cannot rotate or fall off the edges of the grid. In the final state, the figures cannot overlap.

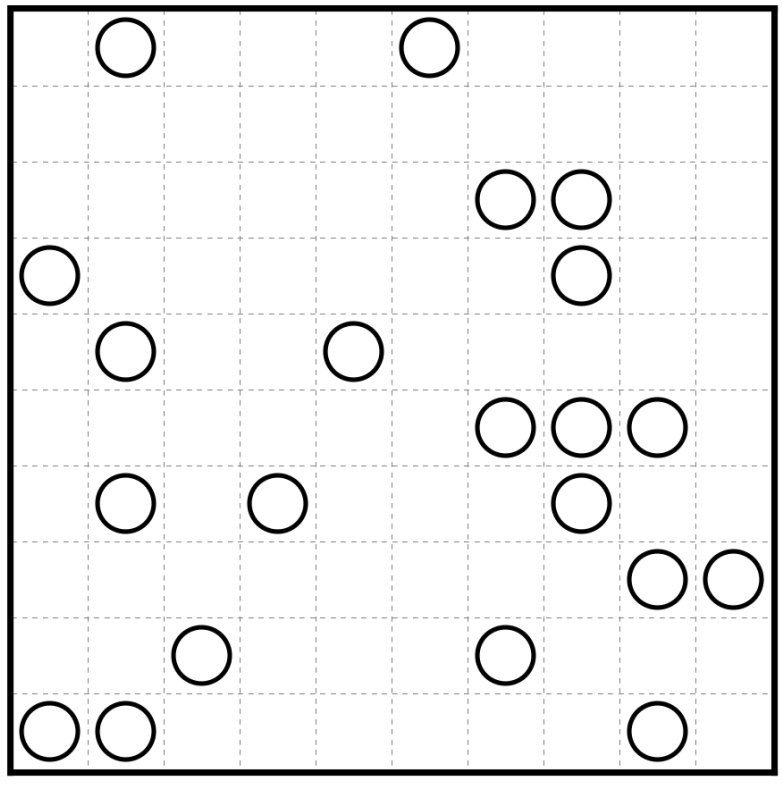
Solution: T - 3 units right, P- 2 units left, P - 1 down, W- 3 right, F- 3 left

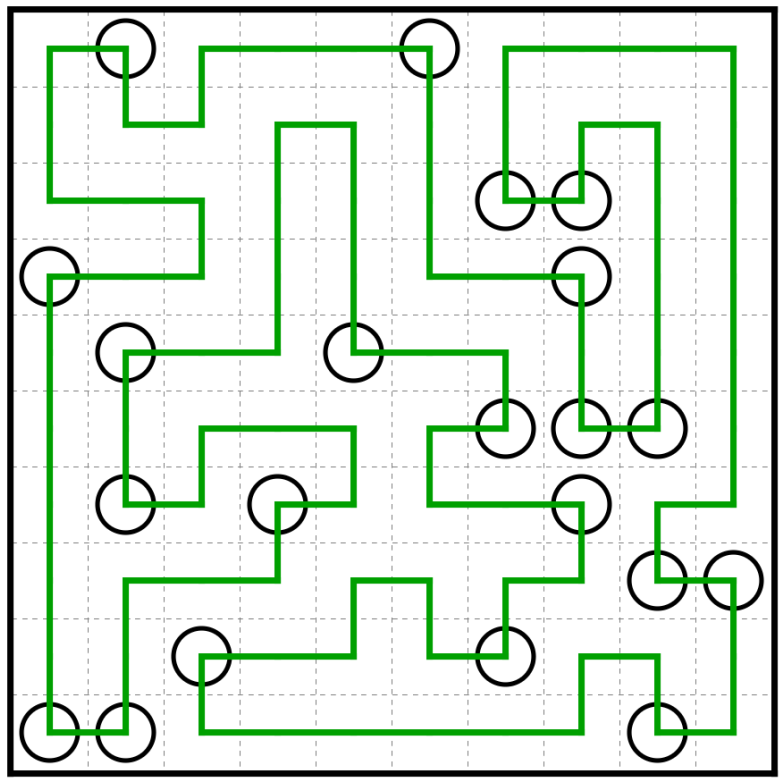


Submitted by Anurag

NON-CONSECUTIVE LOOP

Draw a single closed loop that connects the centres of all cells horizontally or vertically. The loop may not cross itself or branch off. The loop must turn in every circle. For any two consecutively visited circles along the loop, the sum of lengths of segments on either side of one circle has to be different than that of the other circle.

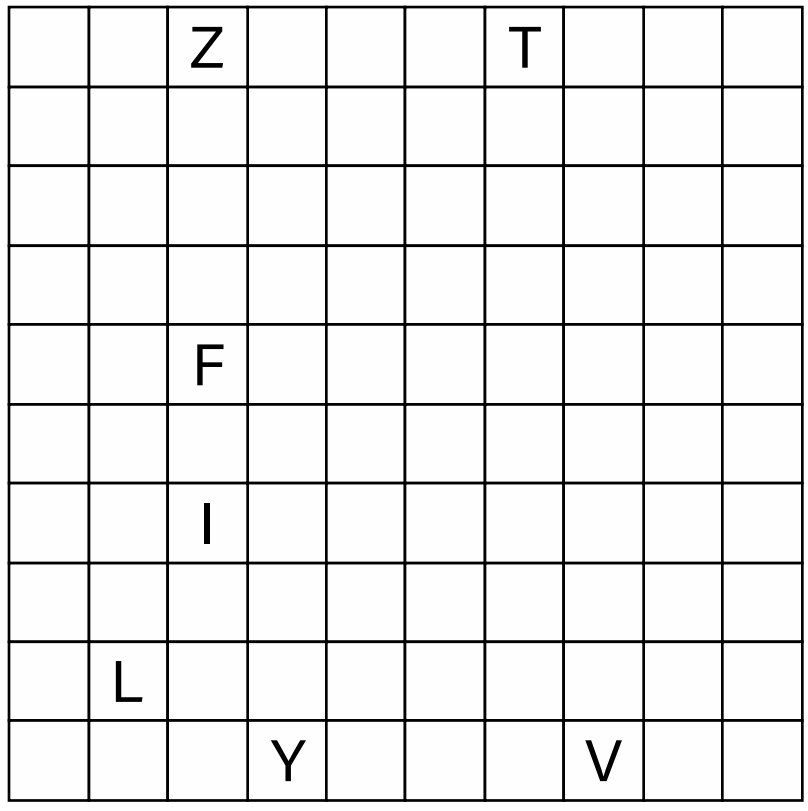


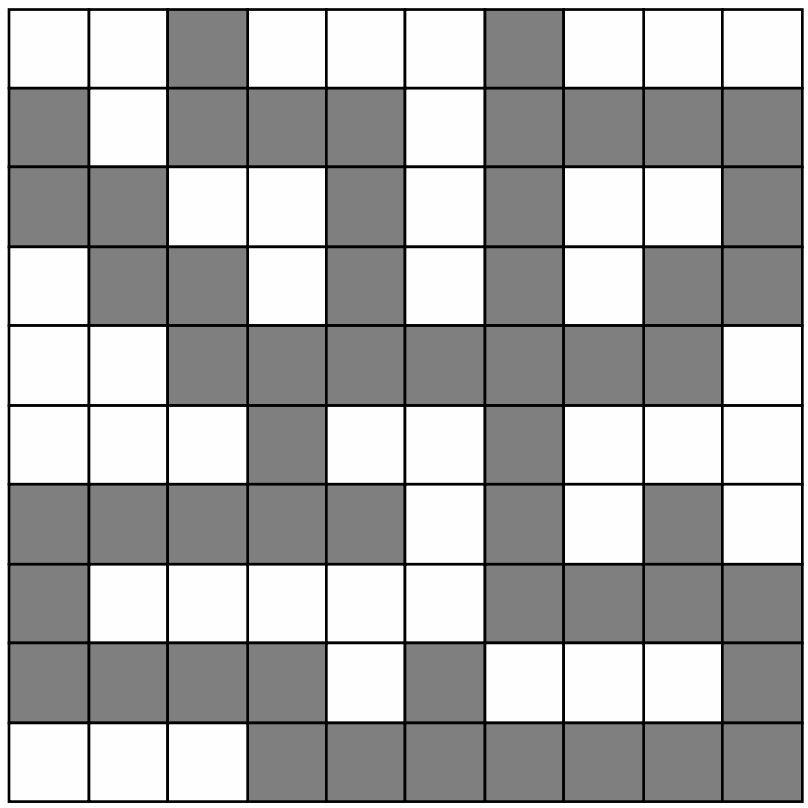


Submitted by Anurag

OPTIMAL PENTOMINO WALL

Place eleven non-overlapping pentominoes as shaded cells such that a single group of connected shaded cells is formed, that does not contain any 2x2 square of shaded cells. It must be possible to tile All unshaded cells by triminoes(3-cell figures). Pentominoes may be Rotated or reflected. Given Letters must be occupied by the pentomino that they represent.

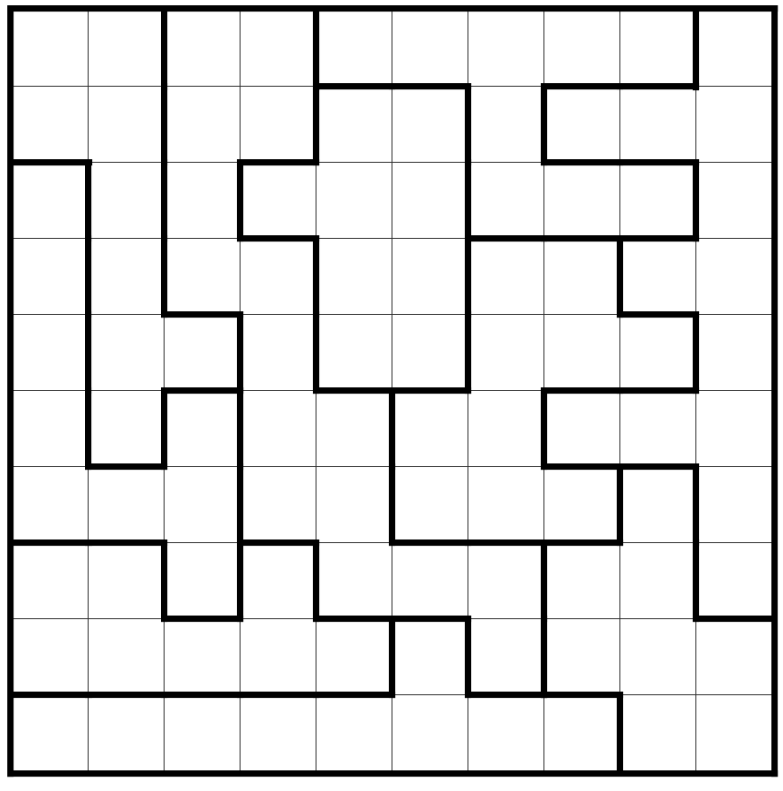


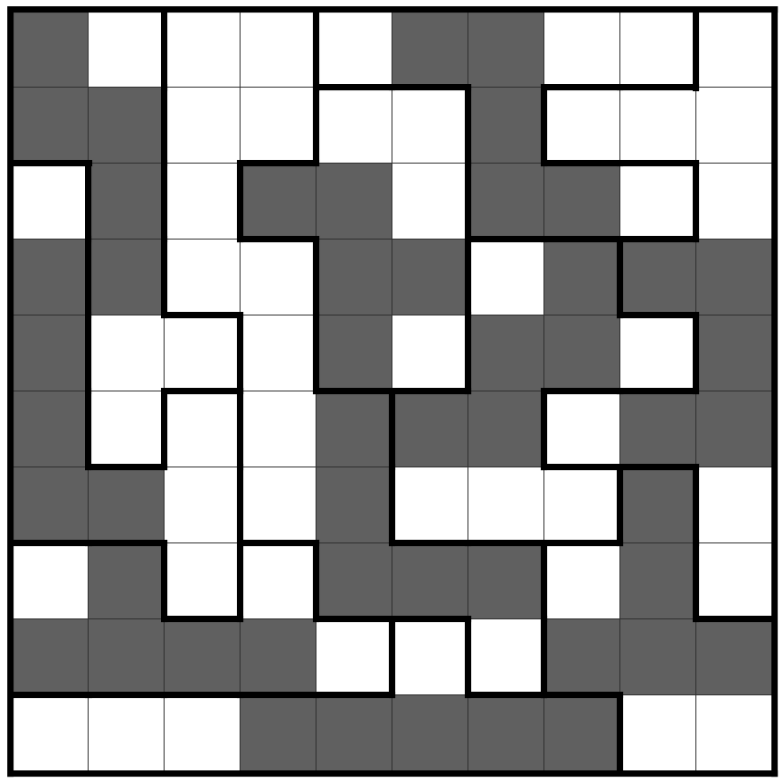


Submitted by Anurag

PENTOMINO ARMS

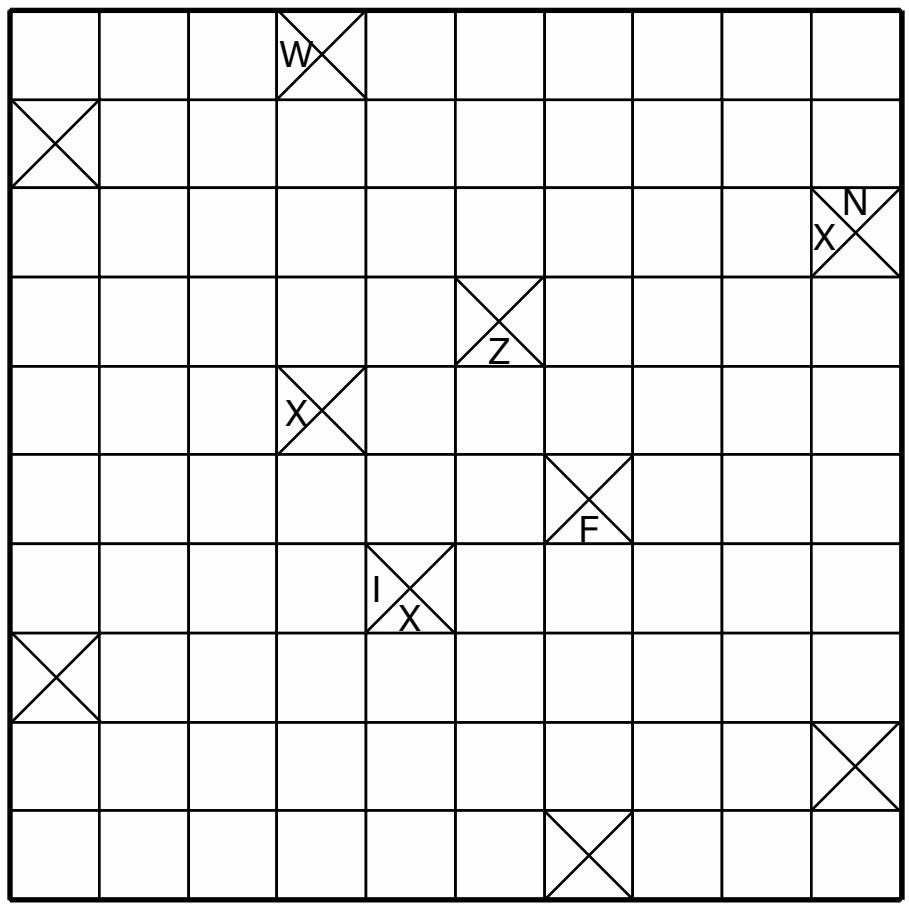
Place one different pentomino into every outlined region, rotations and reflections allowed, so that all pentomino parts are connected in a single contiguous group through edges. The dead end cells of the pentominoes work as arms(contact points). When two pentominoes touch orthogonally, they can make contact through their dead end cells only. No 2x2 group of cells can all be occupied by pentominoes.

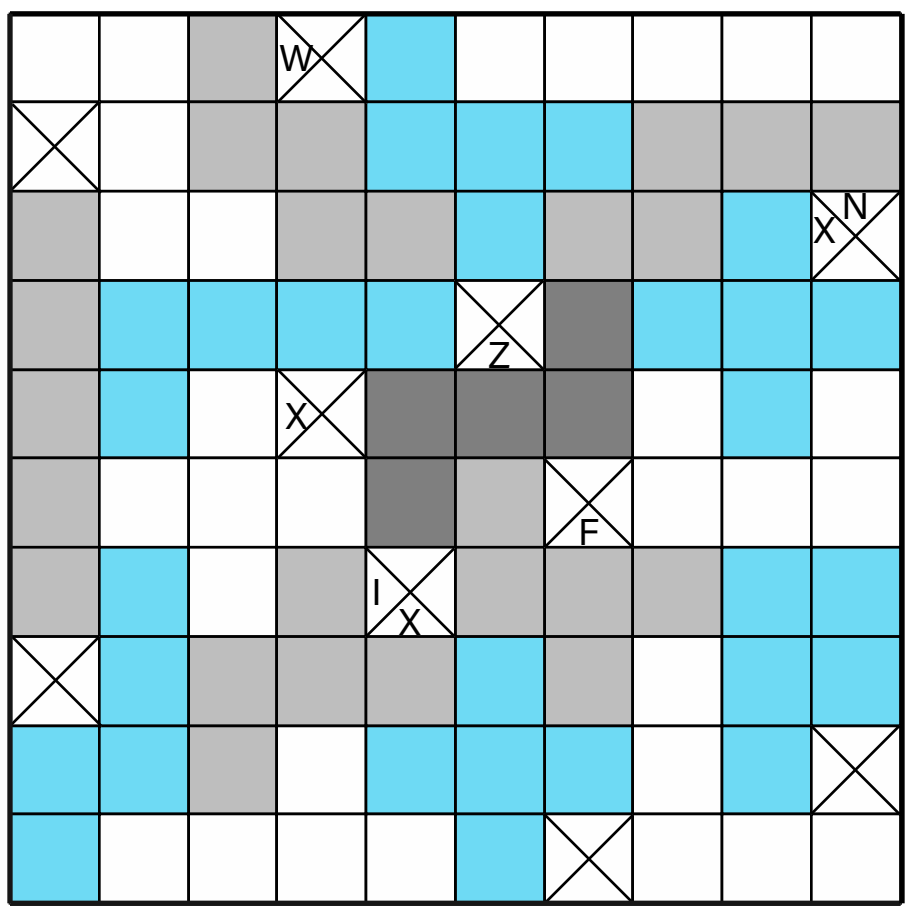




PENTOMINO STREET

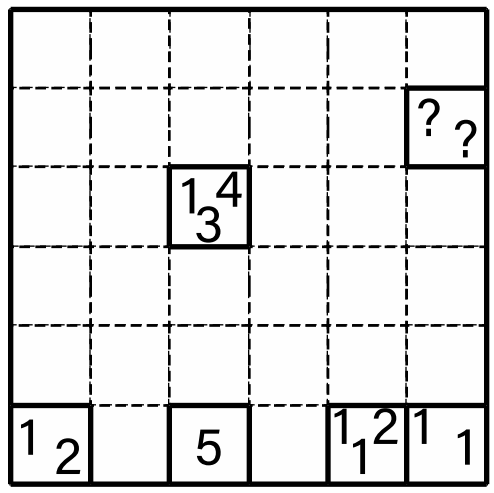
Divide the grid into pentominoes, leaving only the clue cells. No two identical pentominoes may touch each other orthogonally. Letter in a clue cell indicates that at least one pentomino of that type is located in the corresponding direction when observing from that cell until the edge of the grid.

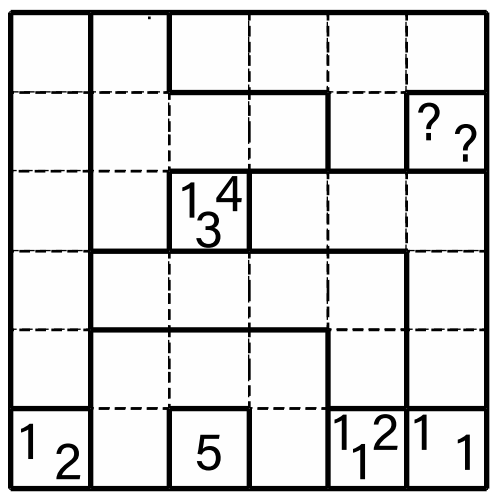




PENTOPA

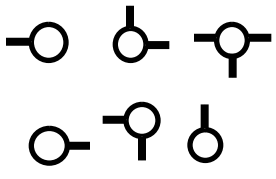
Divide the grid into pentominoes, such that no two identical pentominoes touch each other orthogonally. A number indicates the size of a group of cells belonging to the same pentomino, surrounding that number. If a clue cell has multiple numbers, there has to be one edge separating the groups of cells. In other words, each number corresponds to a different pentominoes.

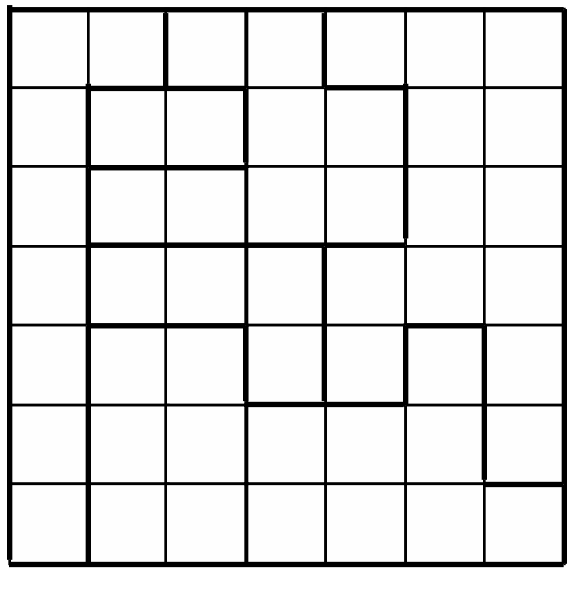


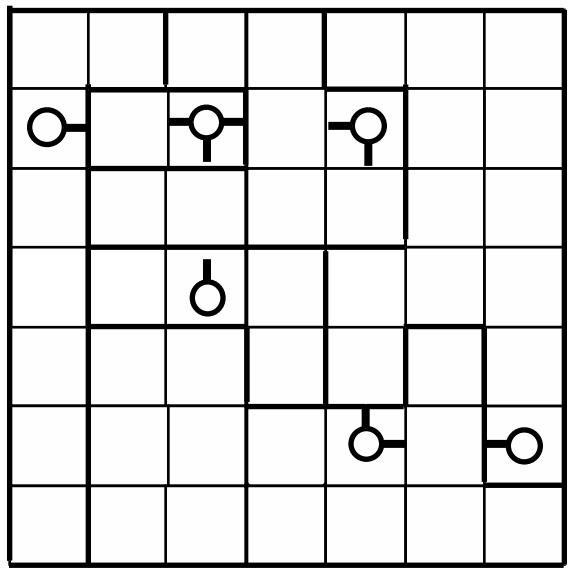


POINT AND PLACE

Place one compass from the given set, in each room, so that each compass points to all the directions where atleast one compass is placed. You cannot rotate or reflect any compass. Also, no compass can touch another compass, not even diagonally.



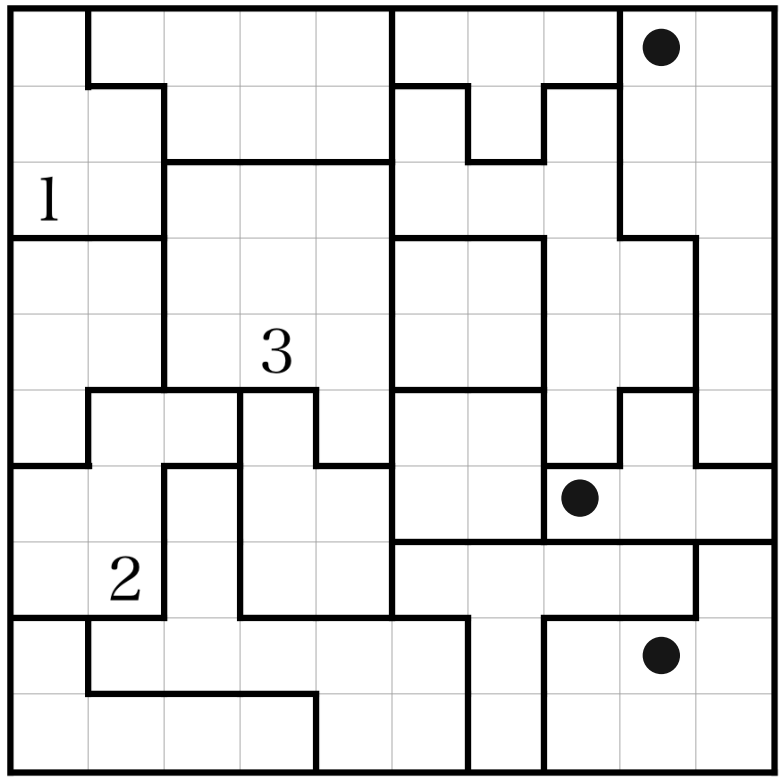


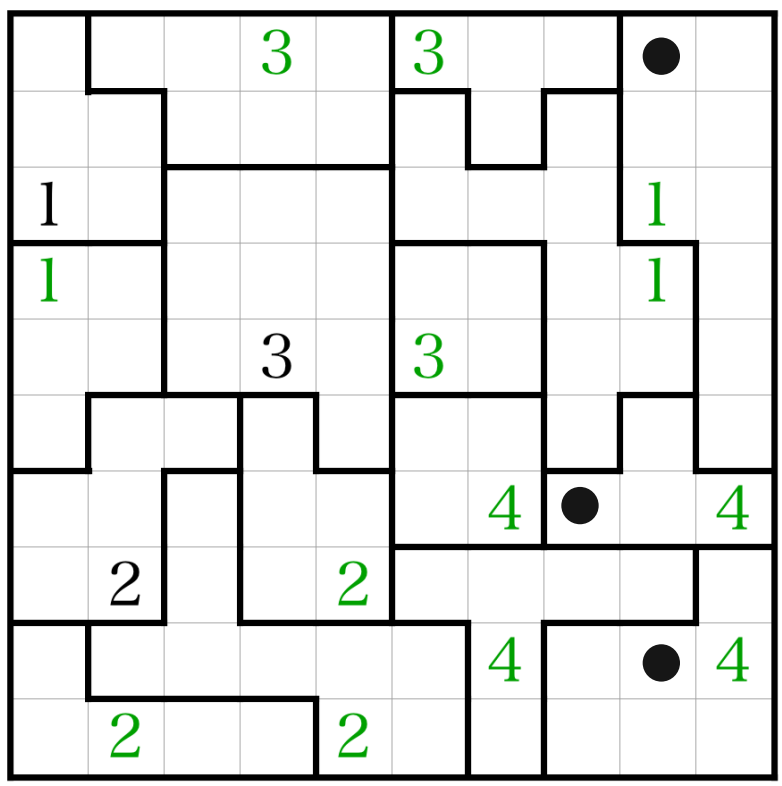


Submitted by Anurag

RECTANGULAR NUMBERS

Place any one number from 1 to 4 in each of the rooms. Every row and column must contain either no number, or two instances of the same number. Cells with a dot cannot contain number.

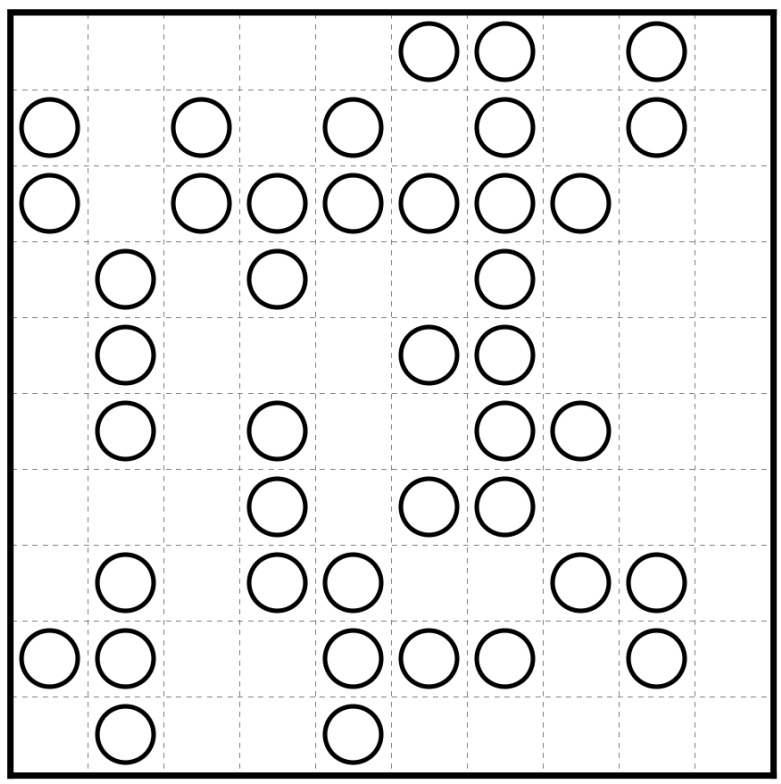


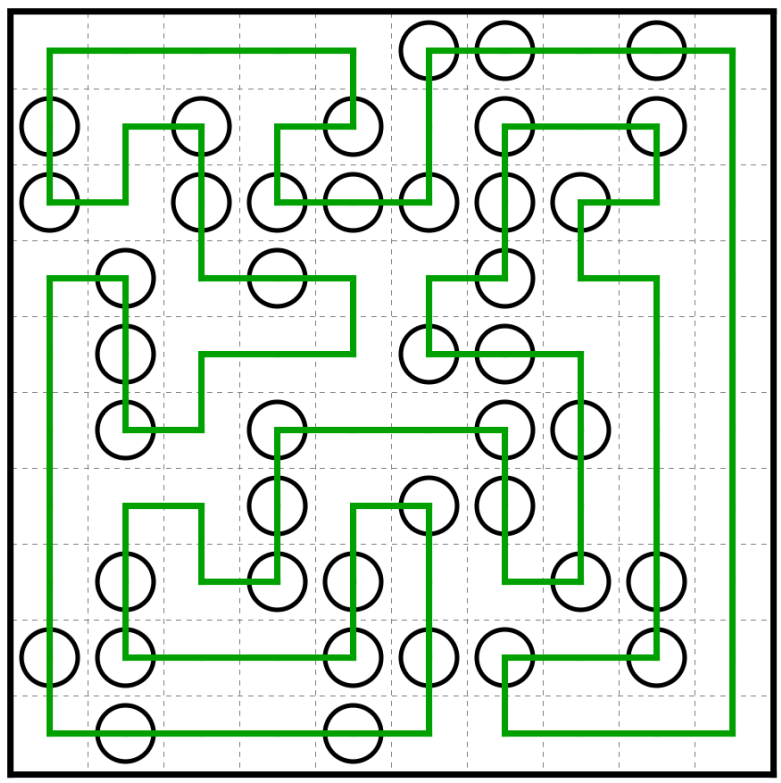


Submitted by Anurag

RIPPLE LOOP

Draw a closed loop that connect the centres of all cells horizontally or vertically. When two circles are edge-adjacent, the loop must go straight through one, and make a right angle turn in the other.

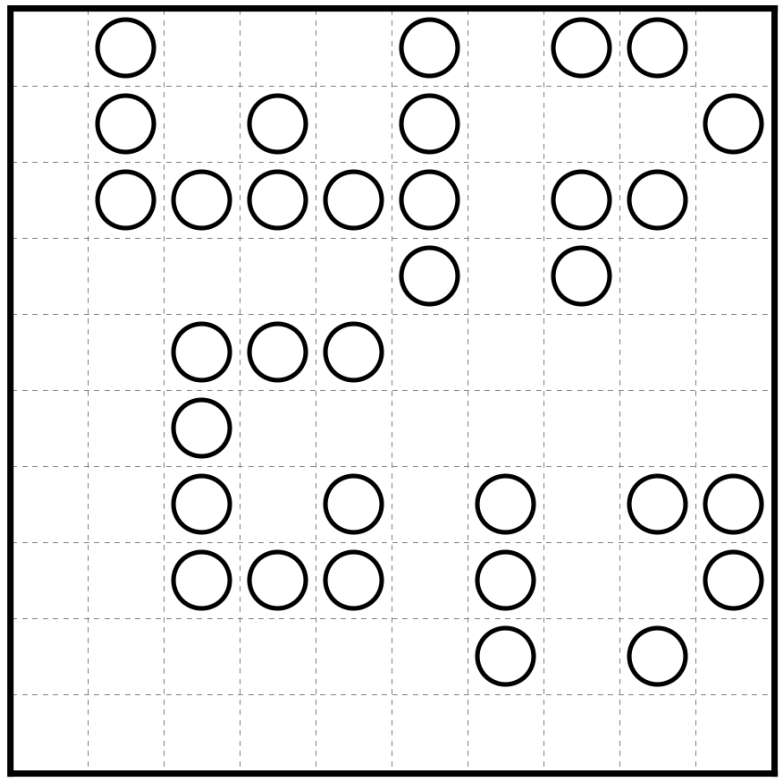


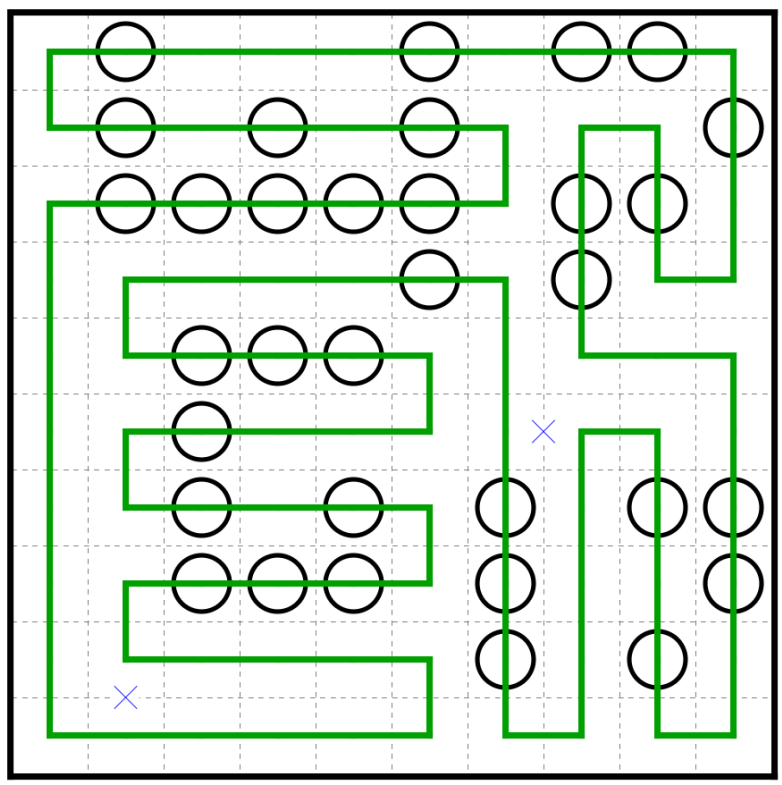


Submitted by Anurag

SEPARATOR LOOP

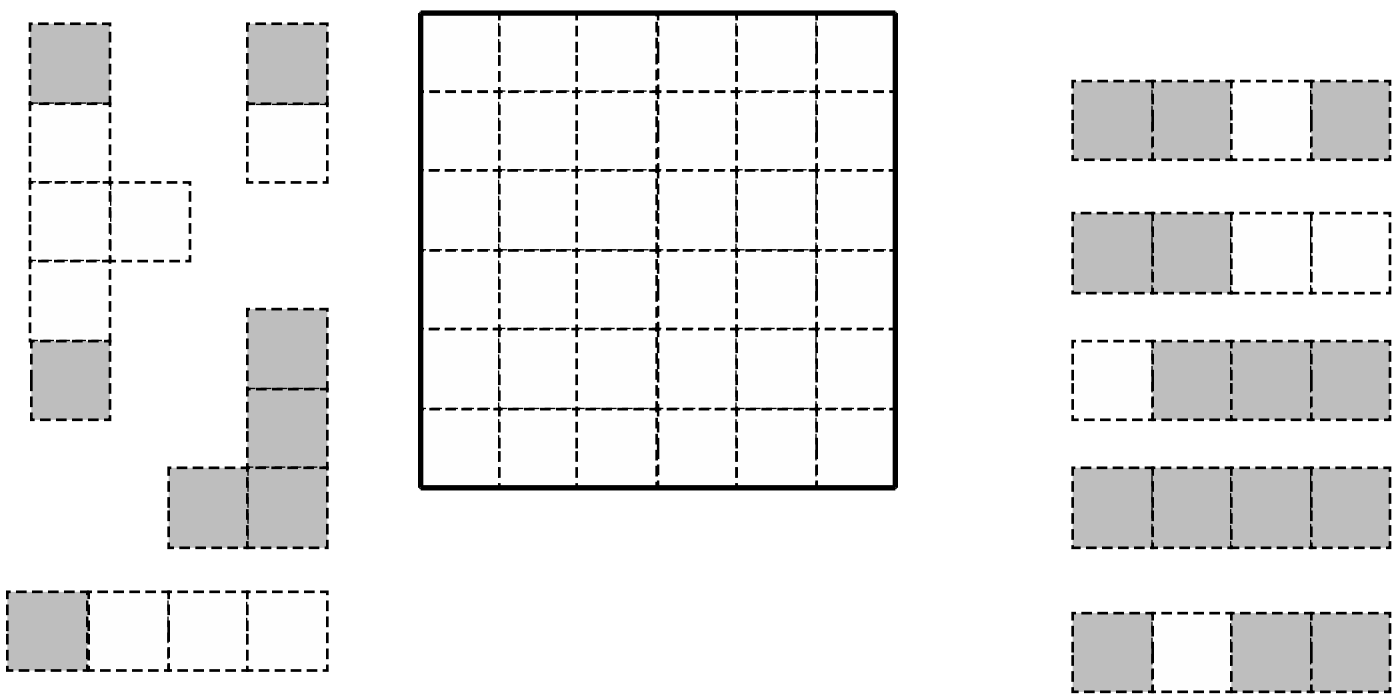
Draw a single closed loop that connects the centres of all cells horizontally or vertically. The loop may not cross itself. Along the loop, no two line segments of the same length can meet. In other words, a line segment cannot immediately precede another segment of the same length. The loop must pass straight through a circle.

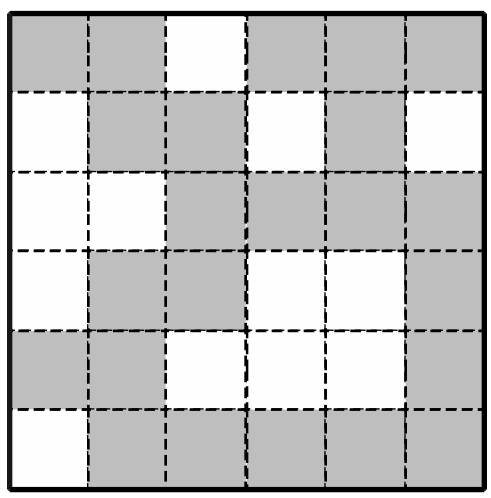




SHADED JIGSAW

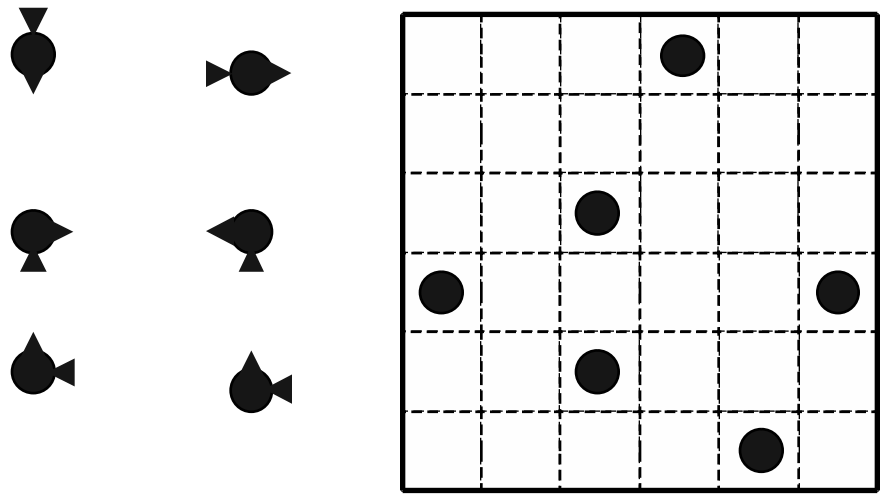
Place all the given shapes into the grid without overlapping, like in a jigsaw puzzle. some cells in each shape are shaded. In the end, all shaded cells must be connected through edges in a single group, with no 2x2 square completely shaded. Shapes cannot be rotated or reflected.

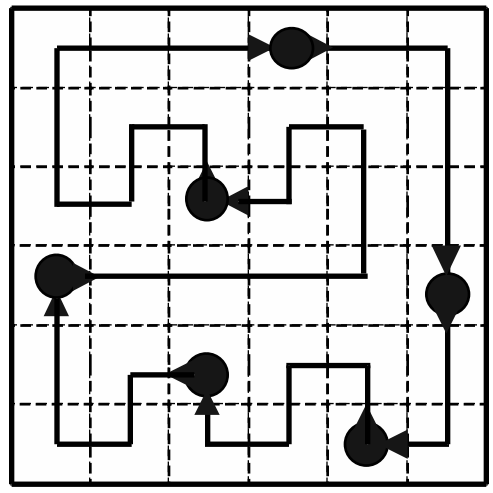




SPACE ODYSSEY

It is year 2150 when a spacecraft is set to explore a patch of the galaxy. Candidate Star systems and their locations are identified. Also identified are the directions of entry and exit into and out of each system. Reveal the hidden directions and trace the closed path of the spacecraft that visits all cells in the grid and does not cross its path. The path has a constant defined direction that does not invert between stars.

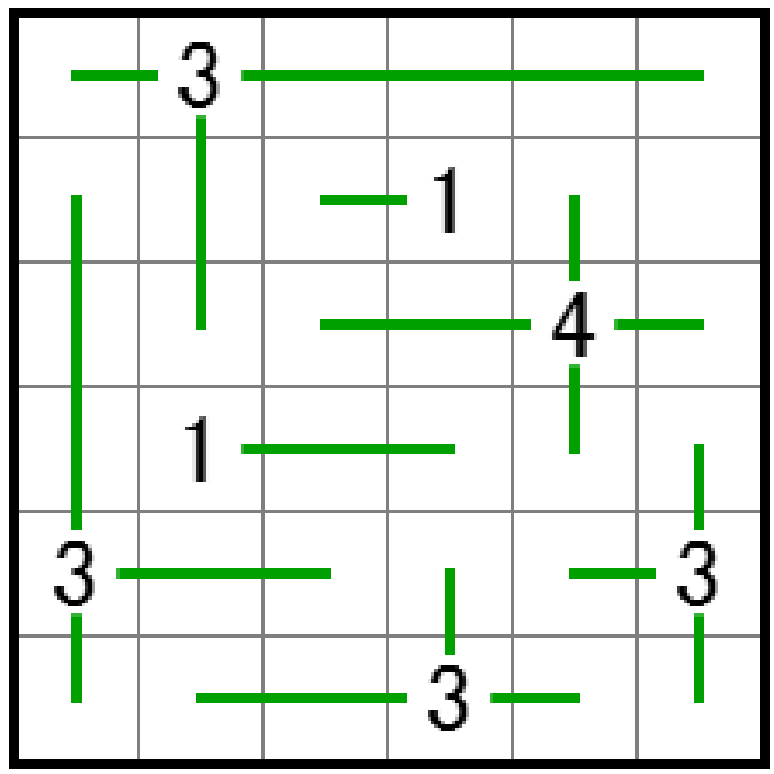




SPECIES

Some species are placed in the grid(represented by a number). Numbers indicate how many limbs extend from the organism occupying that cell. Limbs are horizontal or vertical extensions of any length. The sum of lengths of all limbs for each organism is unique. Limbs do not overlap. Reveal all the limbs.

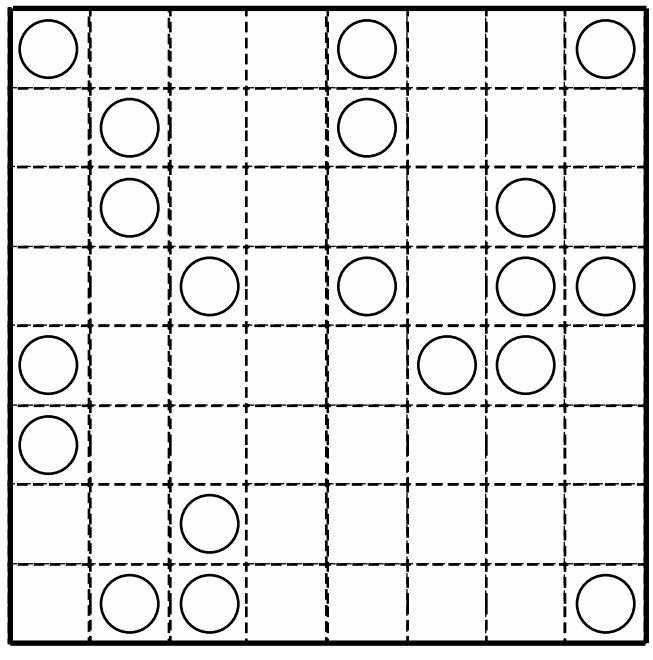
	3				
			1		
				4	
	1				
3					3
			3		

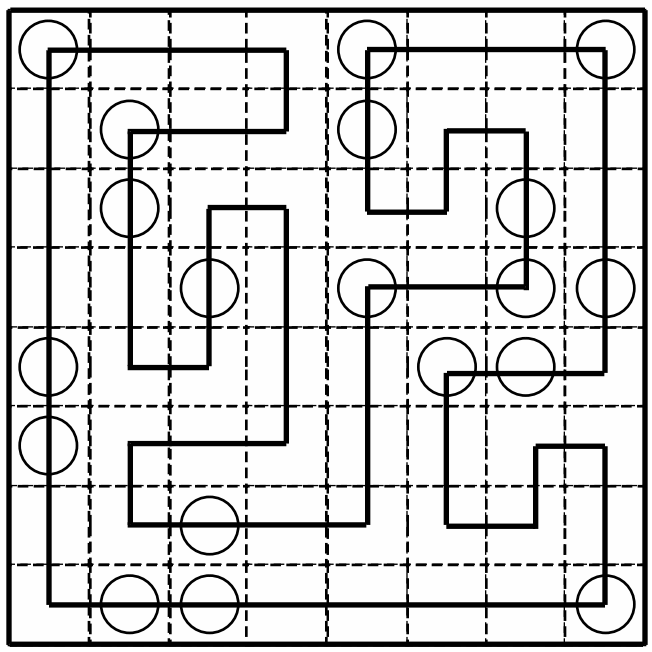


Submitted by Anurag

SUCCESSION LOOP

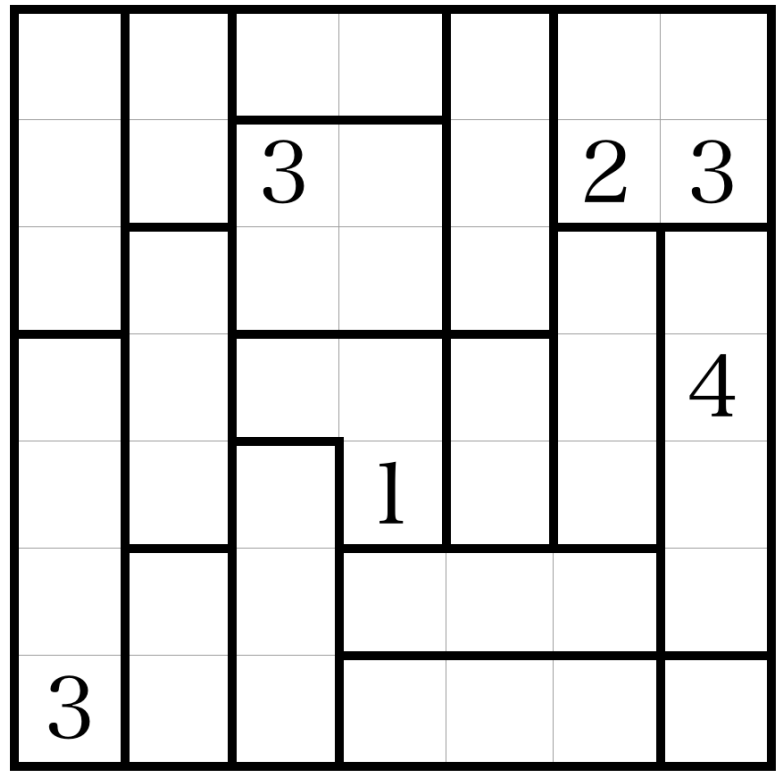
Draw a single closed loop that connects the centres of all cells horizontally or vertically. The loop may not cross itself. Some cells contain a circle. The loop may either pass straight through a circle, or make a 90 degree turn. Which circles the loop turns in or goes straight is not given. When the loop turns in a circle, it has to go straight through the adjacent cells. There is no restriction when the loop goes straight through a circle. Along the loop, Every circle must be either preceded or succeeded by atleast one circle of the same type, where circles are differentiated based on how the loop behaves in the circle.

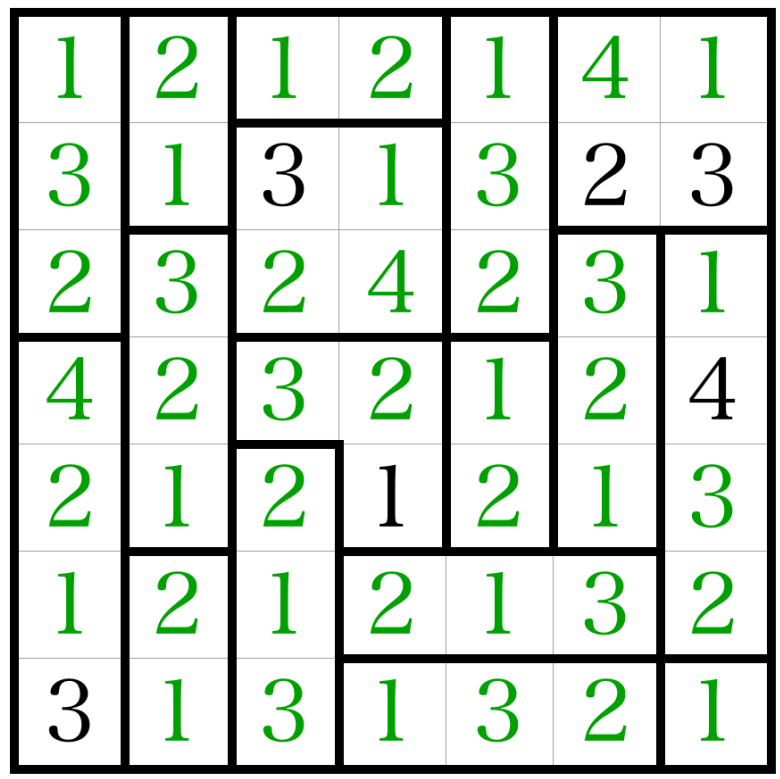




THE LARGEST NUMBER

Fill every outlined region with different numbers 1 to n, where n is the area of the region. No two adjacent cells can contain the same number. No two adjacent cells can both contain the largest number of their corresponding regions.





Submitted by Anurag

TRANSCOMBINATOR

Fill every cell with a number from 1 to 6. No two orthogonally adjacent cells can contain the same number. Every row and column has a combination: exactly 3 unique numbers, with each number from the triplet occurring at least once in that row.

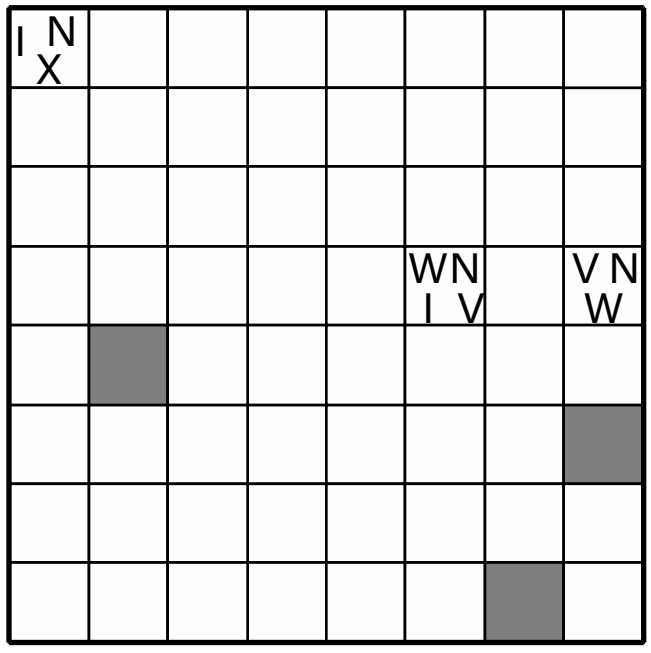
	4	1			1	
			2		3	6
		2				
2	1		2	3		
				1	3	
2		2				2
4			2	1	3	

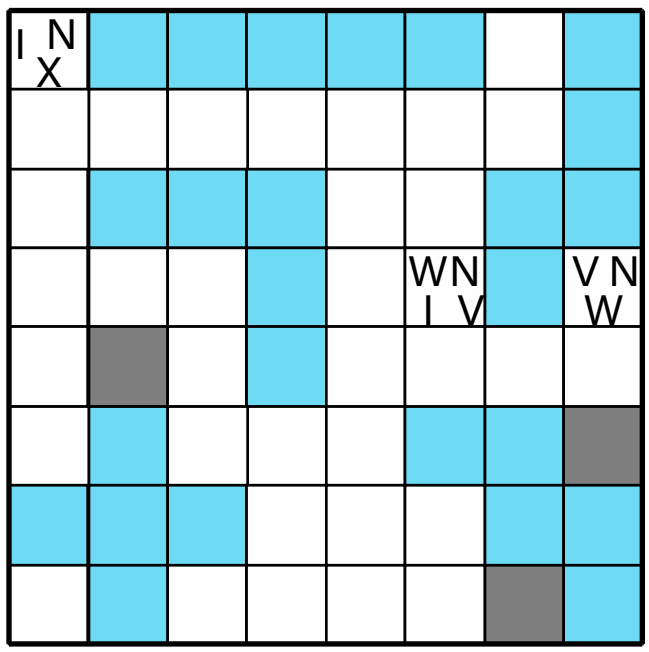
1	4	1	4	3	1	4
2	6	3	2	6	3	6
1	4	2	4	1	2	4
2	1	3	2	3	1	2
1	4	1	4	1	3	4
2	6	2	1	6	1	2
4	1	3	2	1	3	4

Submitted by Anurag

TRANSPENTA

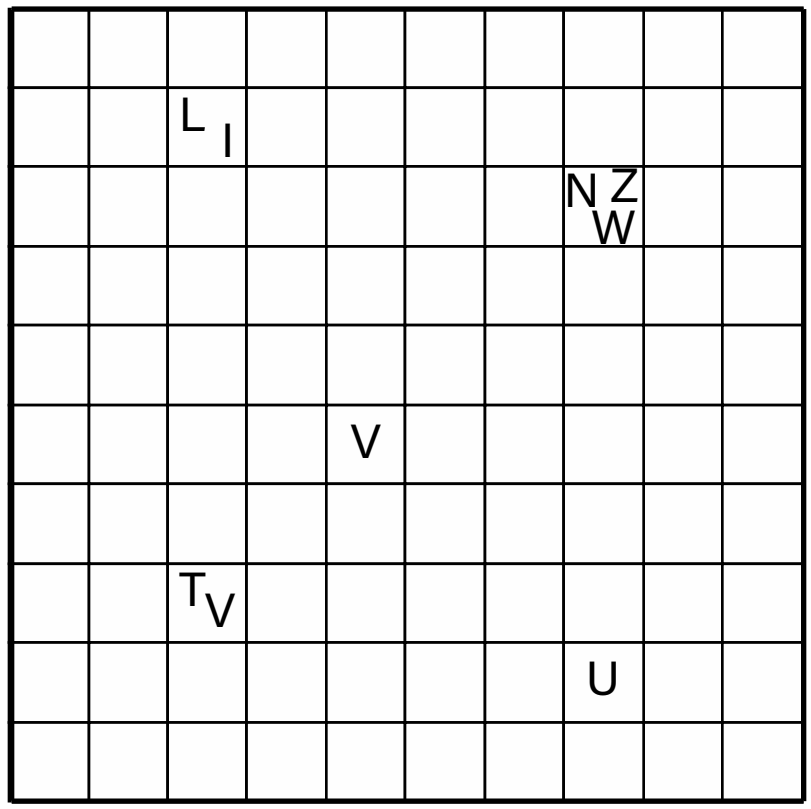
Place some pentominoes without touching each other, not even diagonally. Pentominoes may be Rotated or reflected. Given Letters indicate all pentominoes located in the row or column of the clue cell. Pentominoes parts may not occupy shaded cells.

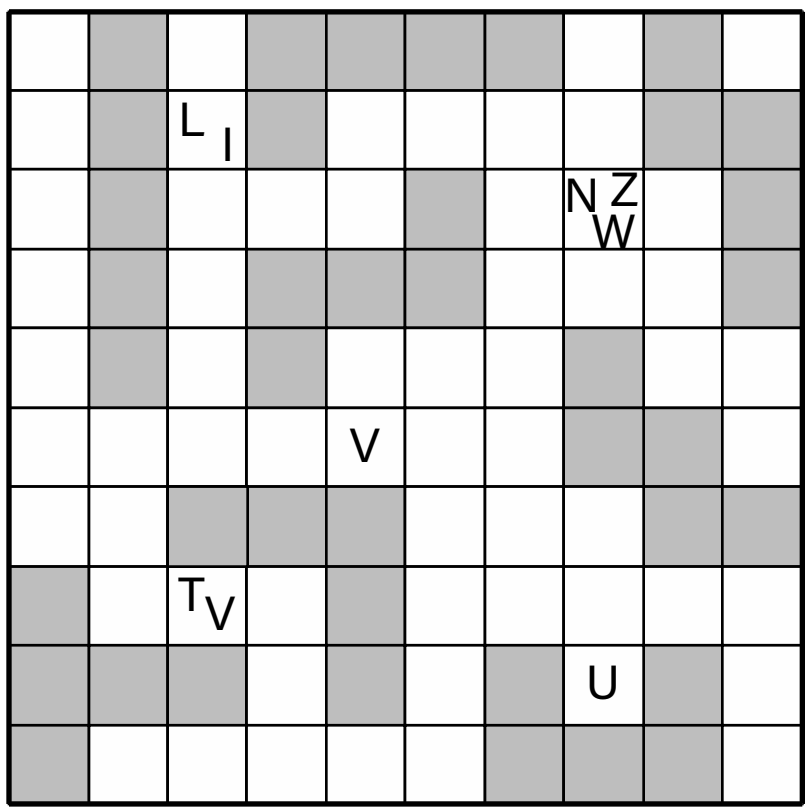




WIDE ANGLE VIEW

Place some different pentominoes without touching each other, not even diagonally. Letters written in a cell indicate all the pentominoes located closest to that cell(when considering four horizontal and vertical directions). Pentominoes may be rotated or reflected.

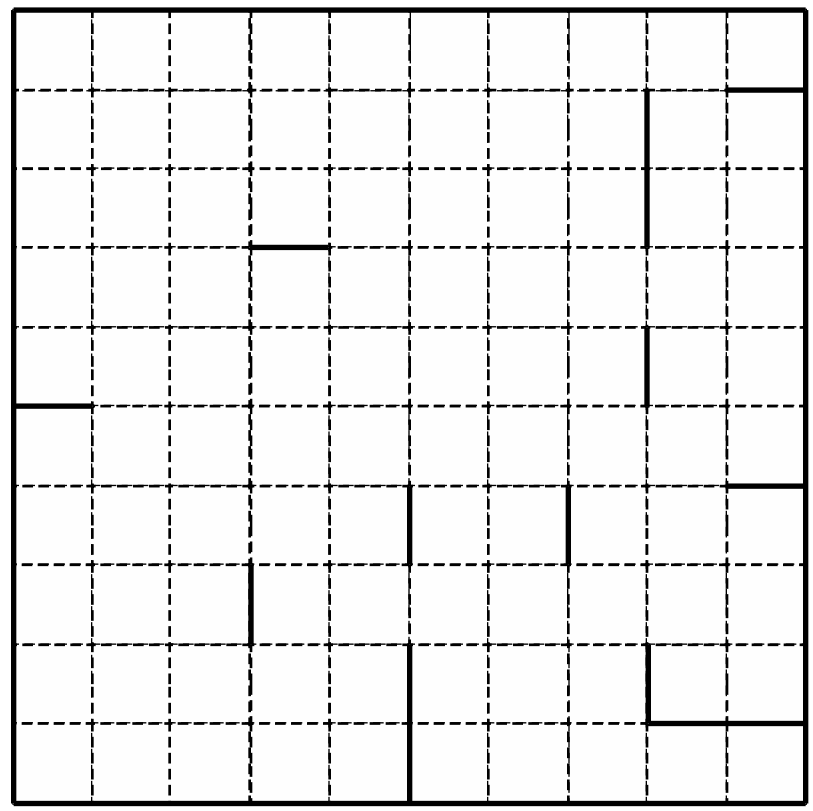


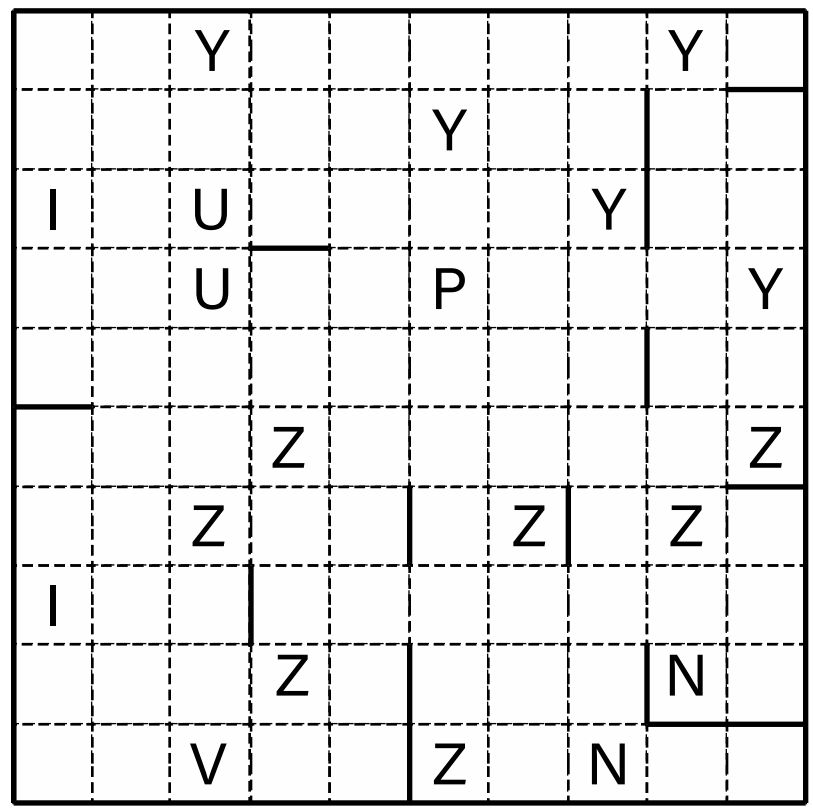


Submitted by Anurag

X ON BOTH SIDES

Divide the grid into pentominoes. All cells must be part of some pentomino. Pentominoes may be rotated or reflected. Thick borders always separate two identical pentominoes.



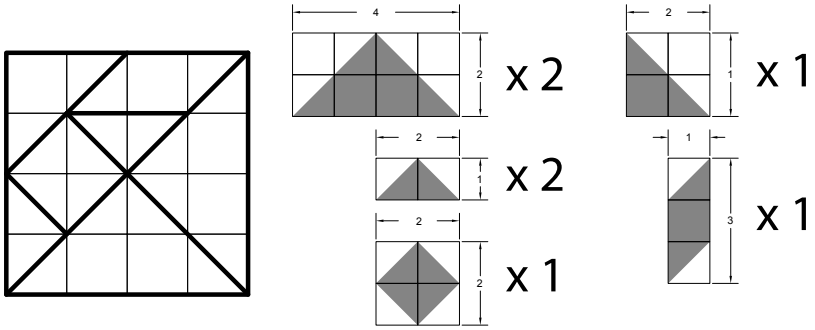


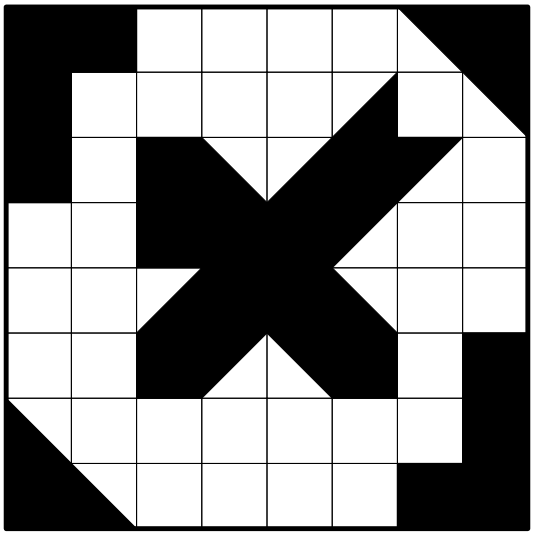
Submitted by Dan Adams

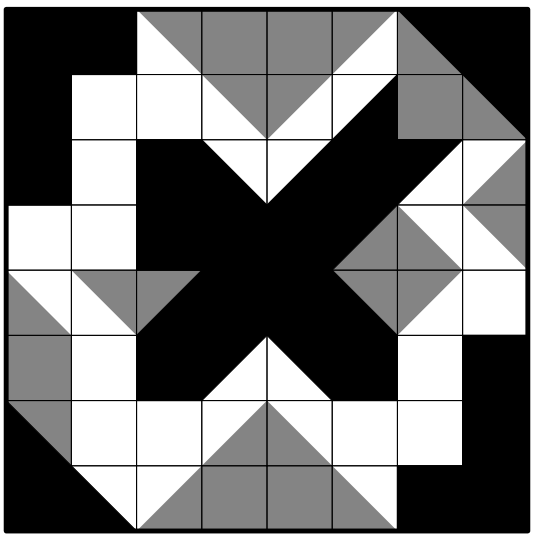
SPATIAL TANGRAMS

Rules

Place the all pieces of the standard Tangram family (shown to the right) into the diagram such that all white space is connected and no pieces touch each other on an edge. Pieces may be reflected and/or rotated, so long as all vertices from each piece align with vertices of the grid.





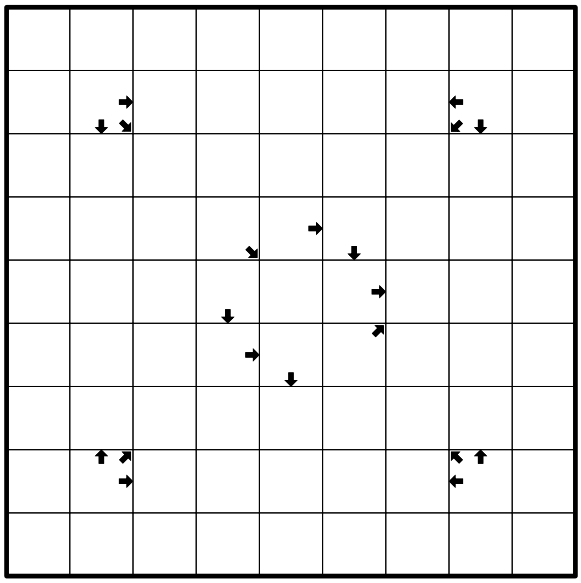


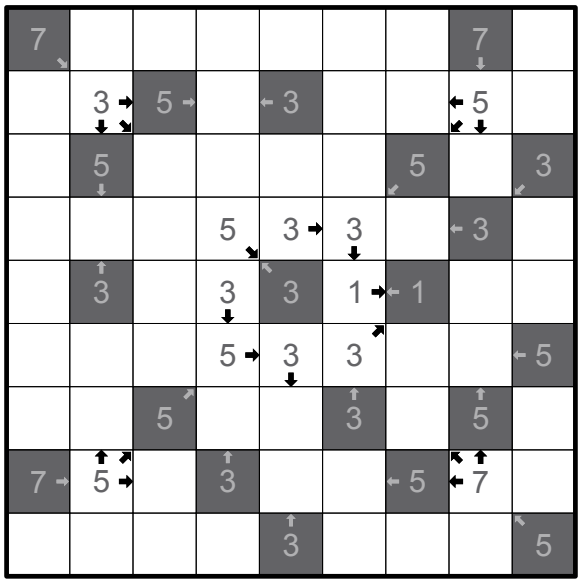
Submitted by Dan Adams

WATCH TOWERS

Rules

In each tower cell (with one or more arrows), place a number "x" such that each arrow points to a shaded cell x cells away in the direction of the arrow. Two arrows cannot point to the same shaded cell, and shaded cells cannot share an edge. All unshaded cells, including tower cells, must be orthogonally connected. Tower cells cannot be shaded.



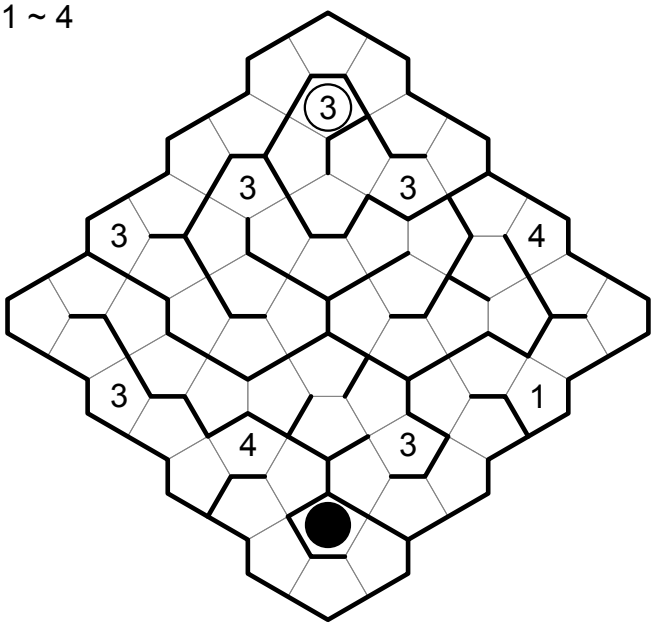


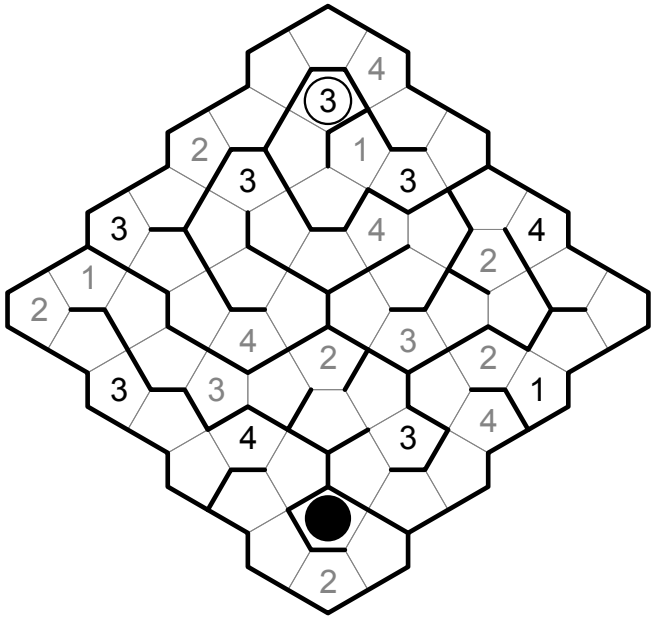
LABYRINTH

Rules

Fill numbers within the range indicated into some grid cells such that each number equals the number of cell borders separating that cell from the next number in the sequence. The sequence starts at the white circle and ends at the black circle and cannot contain the same number twice in a row. Additionally, two cells sharing a vertex cannot contain the same number. All white space not occupied by a number or either circle must be connected edge-to-edge (disregarding labyrinth edges).

1 ~ 4

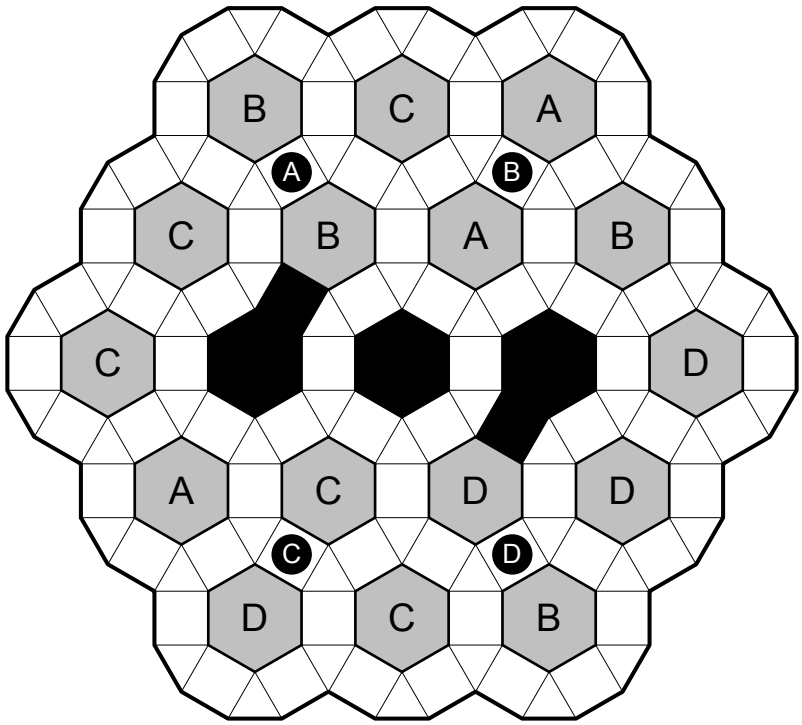


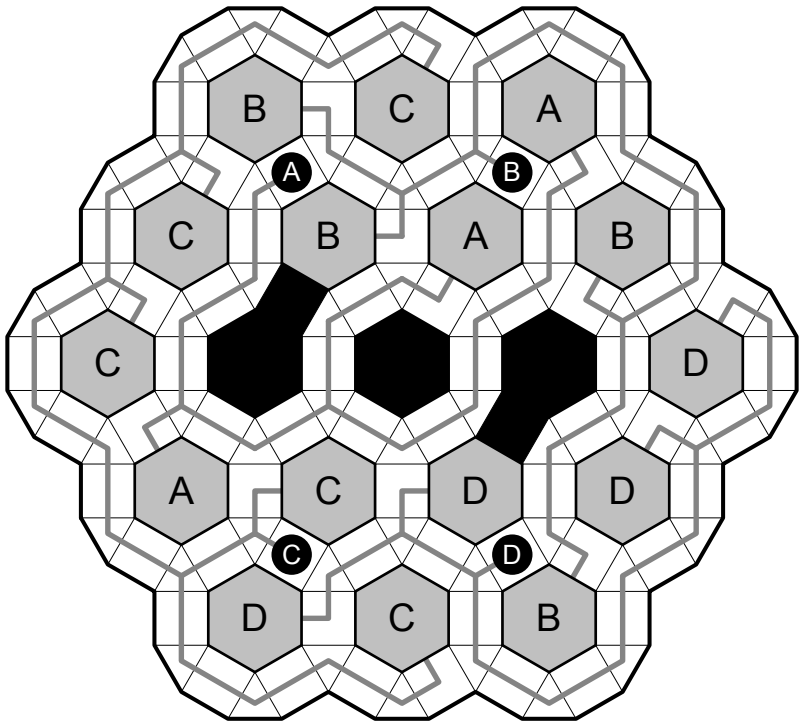


GRAPEVINE

Rules

Draw vines to connect all grapes (grey hexagons) to stems (black circles) with the same letter. The vine can branch only at triangular cells. Every white cell must contain part of a vine. Vines must end on a grape (no dead ends).



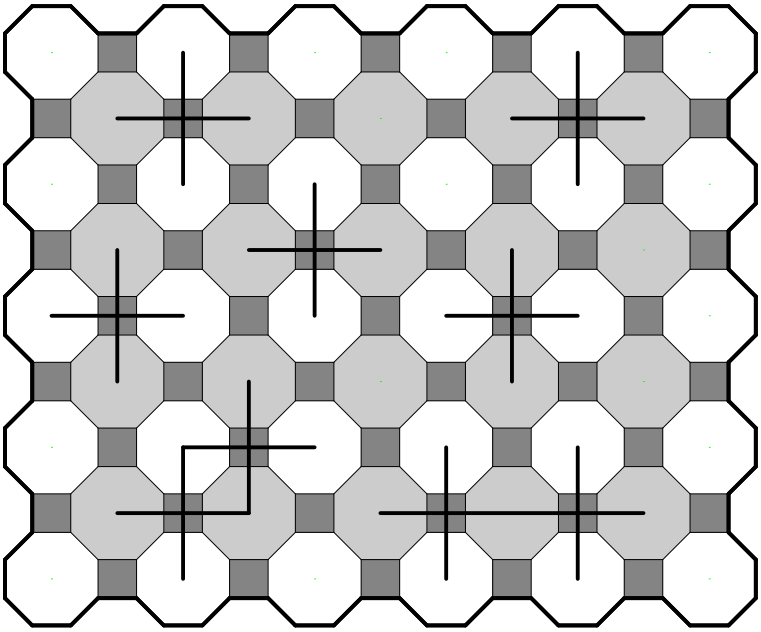


Submitted by Dan Adams

PENTOMINOUS WORD SEARCH

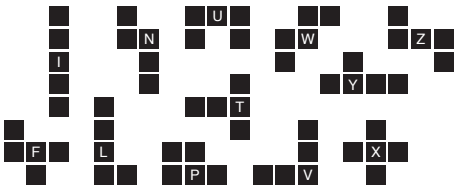
Rules

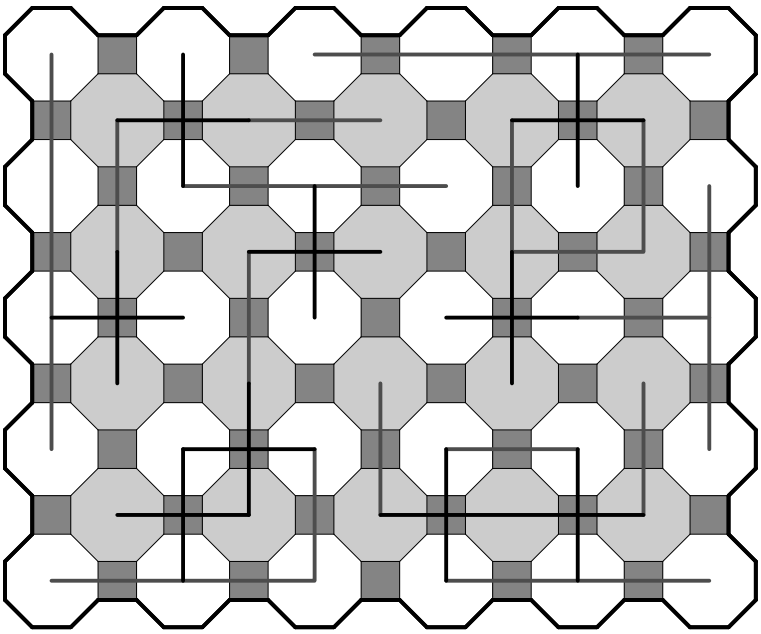
The grid below consists of a 5x4 grid of light grey octagons within a 6x5 grid of white octagons. Divide both of these grids into pentominoes such that intersecting groups of pentominoes form the "words" given (the order of letters is insignificant). All intersections have been marked on the grid. Pentominoes of the same shape **MAY** share an edge in either grid.



WORD LIST

PU
PTY
FPVYZ

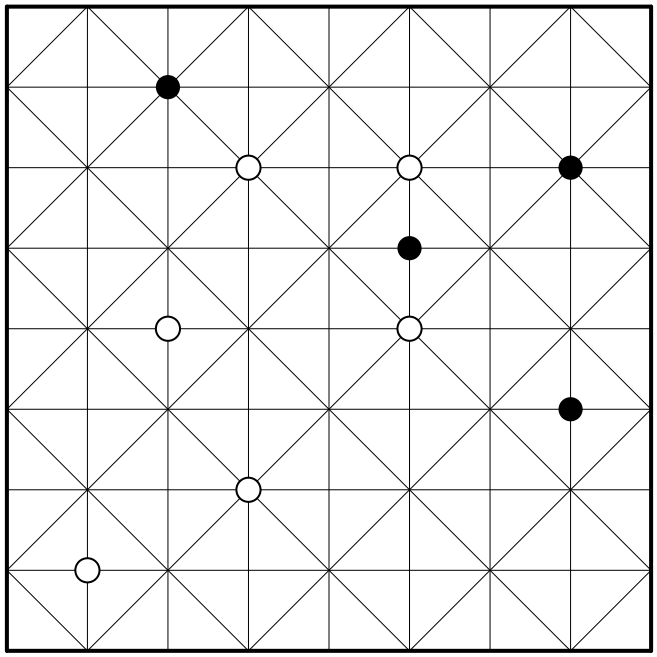


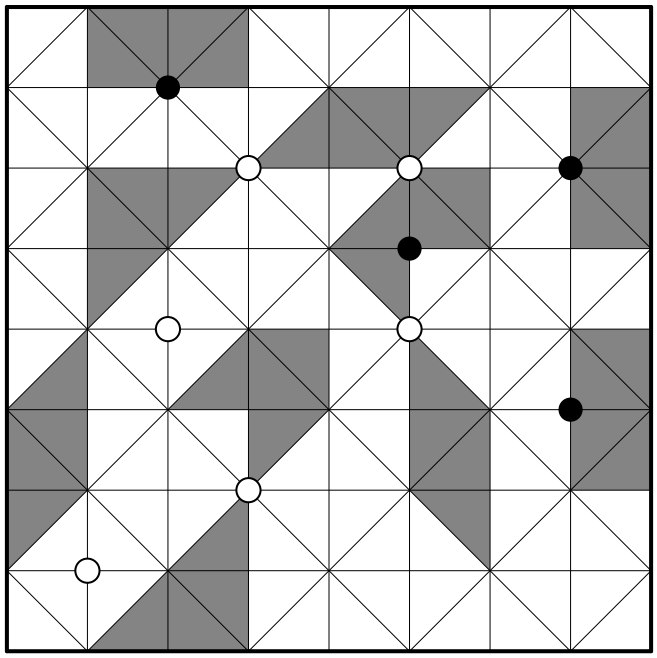


SHARDS

Rules

Shade some cells such that shaded cells form four-cell "shards" that may touch on a vertex, but not an edge. If a vertex has a black circle, then the 8 cells in a 2x2 square surrounding that black circle must contain a complete shard. If a vertex has a white circle, then the 8 cells in a 2x2 square surrounding that vertex must be rotationally symmetrical about that point and at least one cell must be shaded. All unshaded cells must be connected edge to edge.



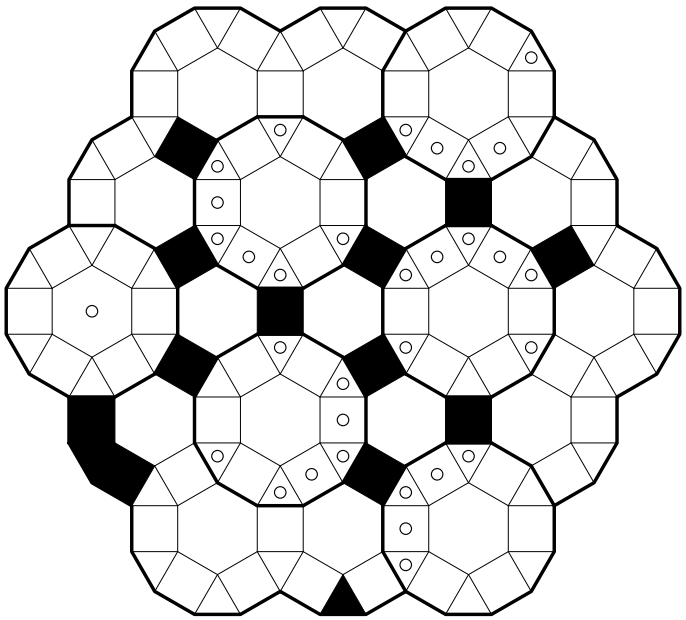


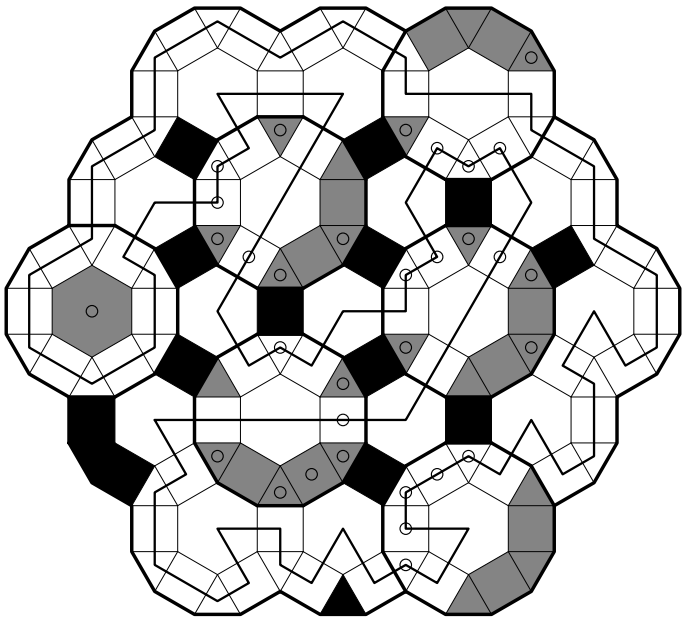
Submitted by Dan Adams

Carousel Loop

Rules

Draw a single loop through the centers of cells such that every unshaded cell is part of the loop. Bold outlined dodecagons are carousels that can each rotate in 60 degree increments. Circles in carousels indicate the start position of "bumpers" that become shaded cells when each carousel is in its final position.





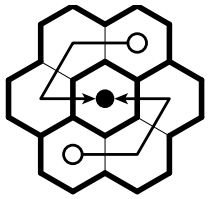
Submitted by Dan Adams

SWIRL

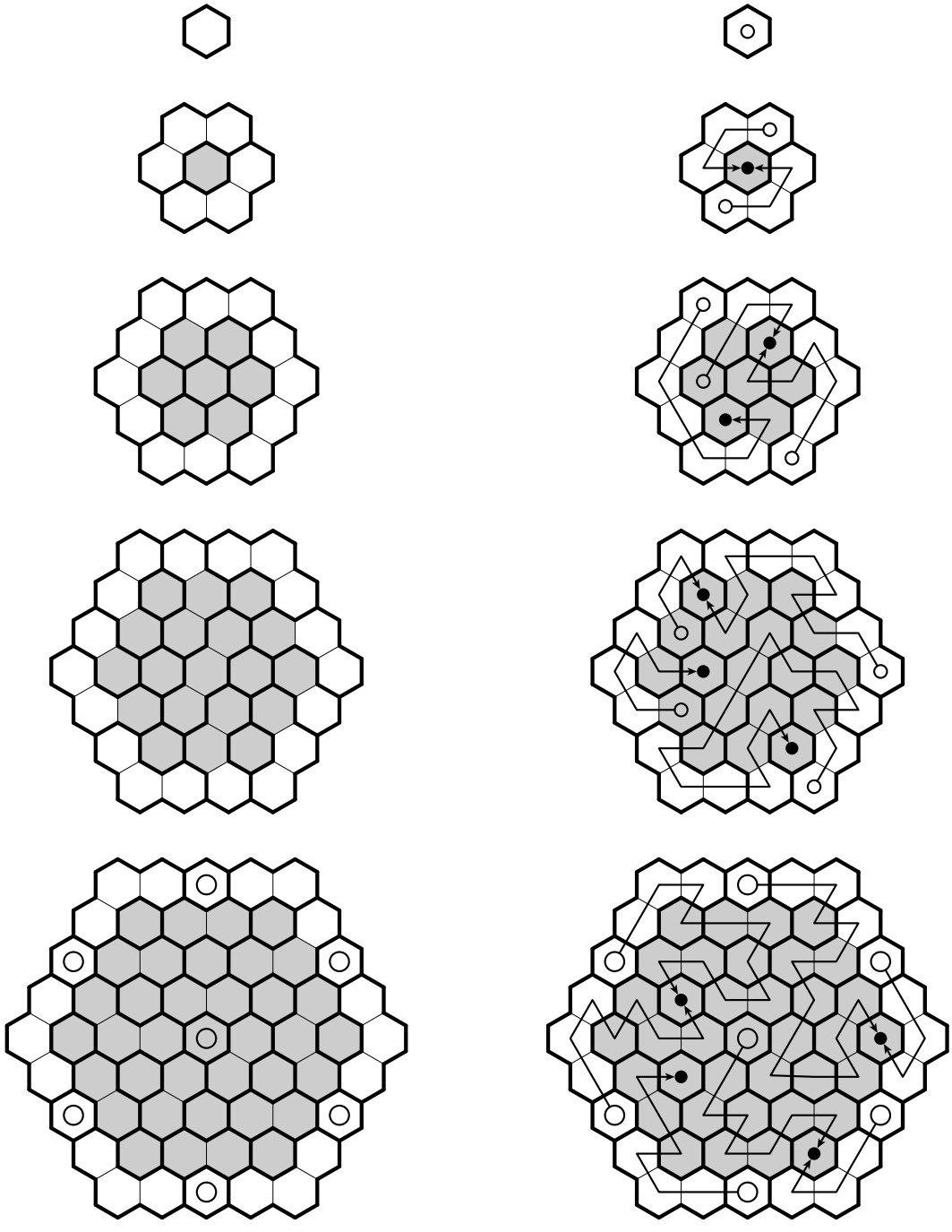
Rules

Draw paths through the centers of cells that start at the circles on the base grid and ascend upward through each grid until a single path reaches the top. Every cell must be part of a path. Bold-outlined clusters of cells can be entered and exited only once. Paths may ascend to a grid above only from a single-celled cluster. Two paths may converge only if they form a "swirl" around a single-celled cluster, in which one path travels uninterrupted through three cells neighboring the convergent cell and the other path travels through the other three cells in the same rotational direction (see example). Naturally, two converging paths must immediately ascend. Grey shading indicates the alignment of the above grid.

Swirl Example



Puzzle



Solution

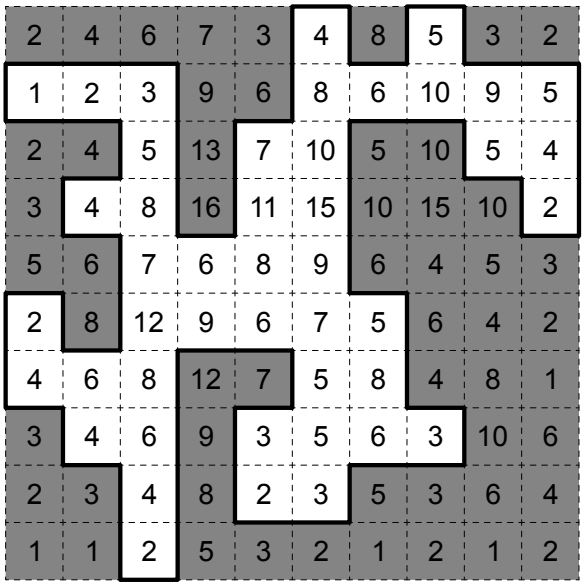
Submitted by Dan Adams

Bossa Cave

Rules

Locate a single Cave (orthogonally connected group of cells that can be circumscribed with a single non-intersecting loop) whose borders touch all four outer edges of the grid and whose digits form a valid Bossa Nova solution (every digit in the cave is equal to the sum of the absolute values of the differences between it and all orgthogonally neighboring digits in the cave).

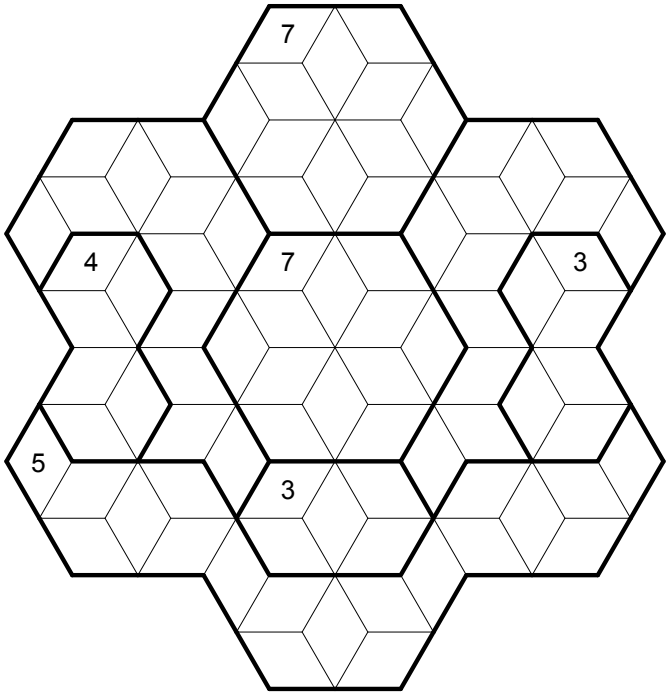
2	4	6	7	3	4	8	5	3	2
1	2	3	9	6	8	6	10	9	5
2	4	5	13	7	10	5	10	5	4
3	4	8	16	11	15	10	15	10	2
5	6	7	6	8	9	6	4	5	3
2	8	12	9	6	7	5	6	4	2
4	6	8	12	7	5	8	4	8	1
3	4	6	9	3	5	6	3	10	6
2	3	4	8	2	3	5	3	6	4
1	1	2	5	3	2	1	2	1	2

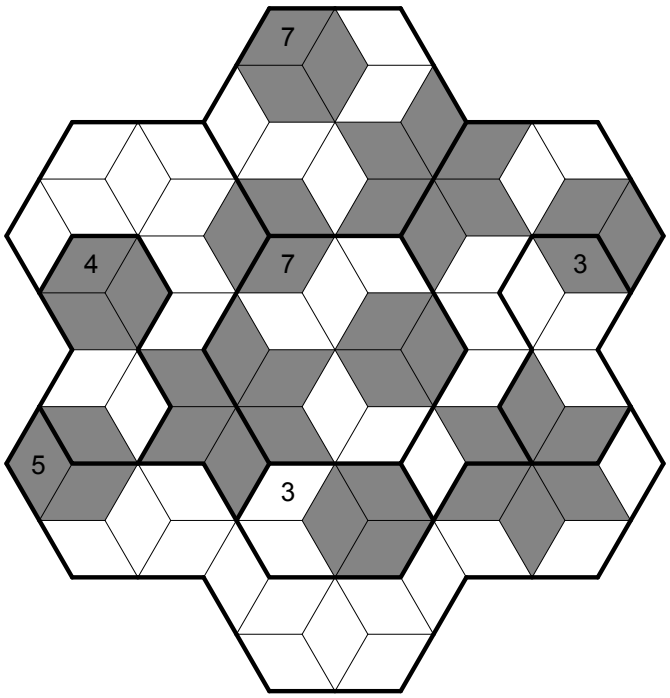


SNOWFLAKES

Rules

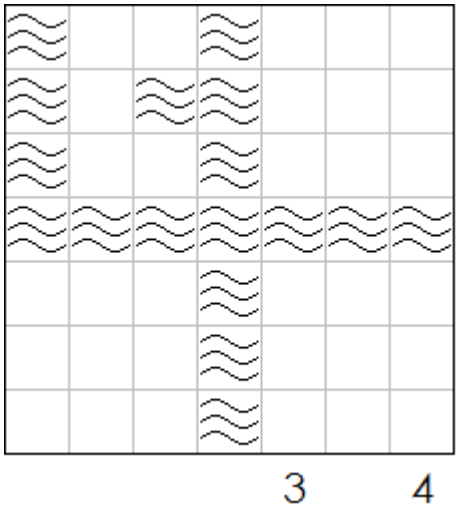
Shade some cells such that they form "snowflakes", in which every cell sharing a vertex is shaded. The central vertex of a snowflake cannot be on the outside edge of the grid. Snowflakes cannot share a cell or edge with each other, but they can touch on a vertex. All snowflakes must be connected in a network. Two types of snowflakes are possible, 3 cell and 6 cell - two snowflakes of the same type cannot touch. Numbers inside of bold-outlined regions indicate the number of cells that are shaded in that region.

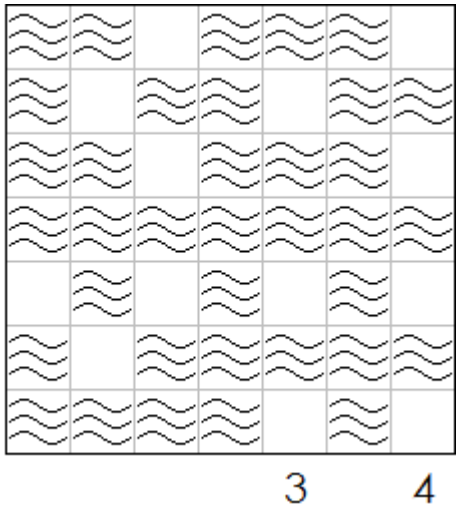




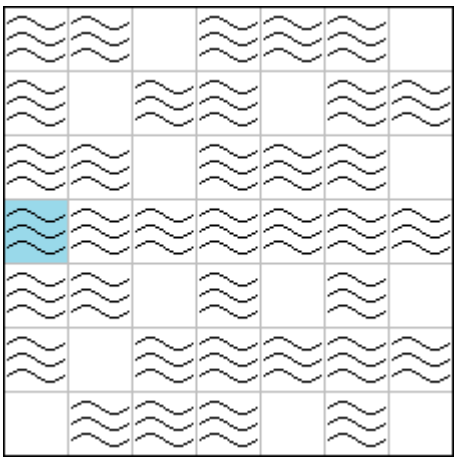
Maximal Archipelago

Turn some land squares into sea such that all sea squares are connected to each other through sea squares orthogonally, no two land squares are adjacent orthogonally, and it's impossible to turn a sea square to land while still satisfying the above two conditions. A number outside the grid shows the number of land squares remaining in the row/column.





(Note that the grid to the right is not a solution; the blue square can be turned to land while still satisfying all conditions: all sea connected orthogonally, no land are adjacent orthogonally.)

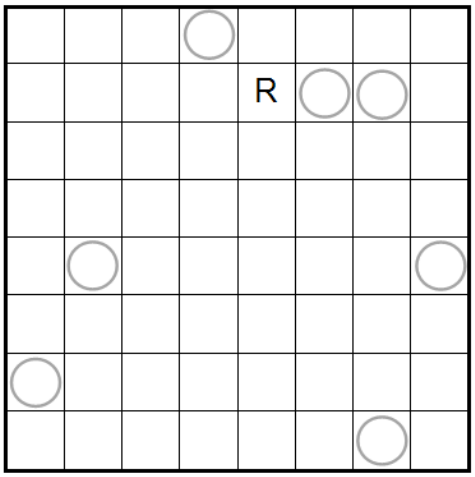


Submitted by Nikola Zivanovic

1. WORD STRING

Write all words from the list in the grid in any of four directions horizontally and vertically. All words are connected in one string. Starting letter of first word is given. When you write the word, copy one letter from this word in orthogonally adjacent cell which is a starting letter of the next word etc. First letters of words (copied letters) are marked by circles. Words can not cross each other nor overlap any part.

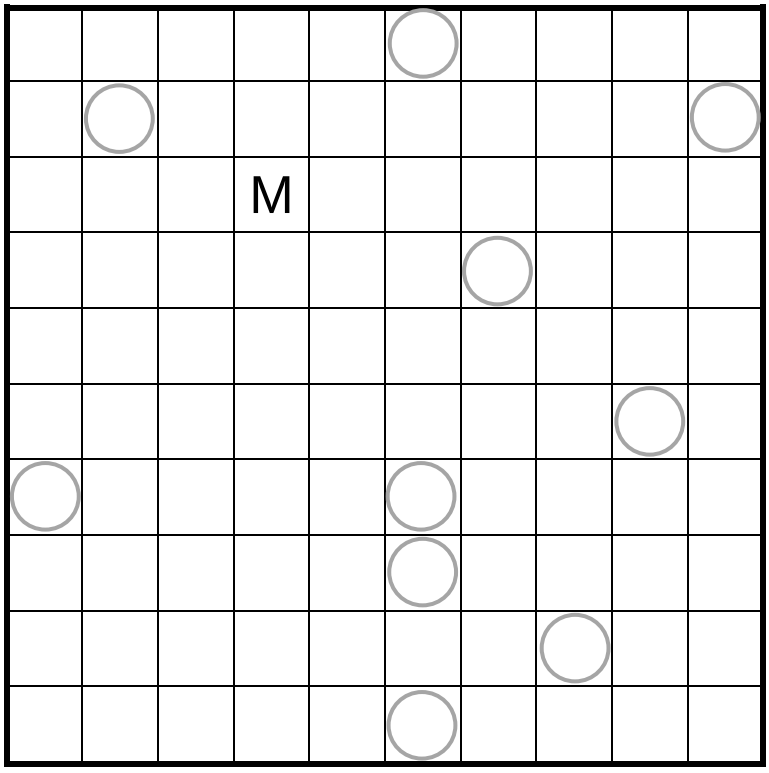
Example:



			O	S	L	O	
A	E	M	O	R	L	L	
R					O	I	
A					N	S	
K	K	Y	I	V	D	B	B
N					O	O	E
A					N	N	R
A	I	S	O	C	I	N	N

ANKARA
BERN
KYIV
LISBON
LONDON
NICOSIA
OSLO
ROME

PUZZLE

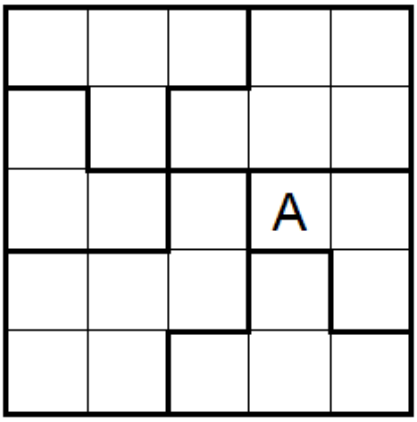


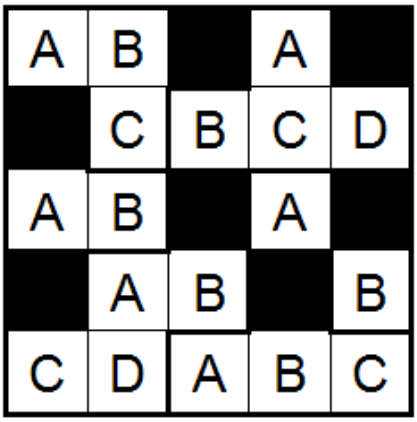
APPLE
APRICOT
AVOCADO
GRAPE
GUAVA
LEMON
MANGO
MELON
ORANGE
PAPAYA
PEACH

2. FALLING LETTERS

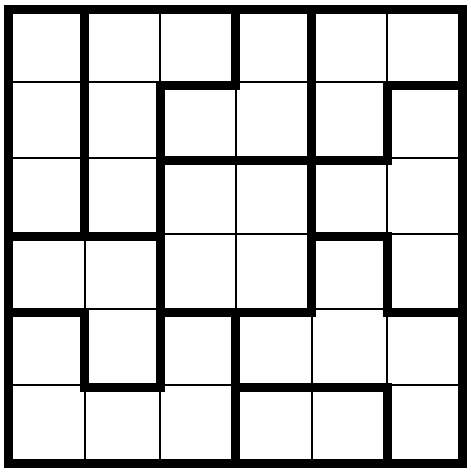
Fill in the grid with the letters and black cells. The same letter can not share a side, and black cells can not share a side, too. Each outlined region must be filled in alphabetical order from left to right and from top to bottom. Each outlined region contains at least one black cell. Cells with the letters create a single continuous area.

Example:



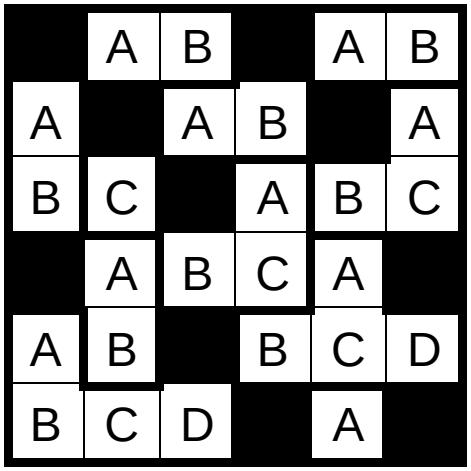


PUZZLE

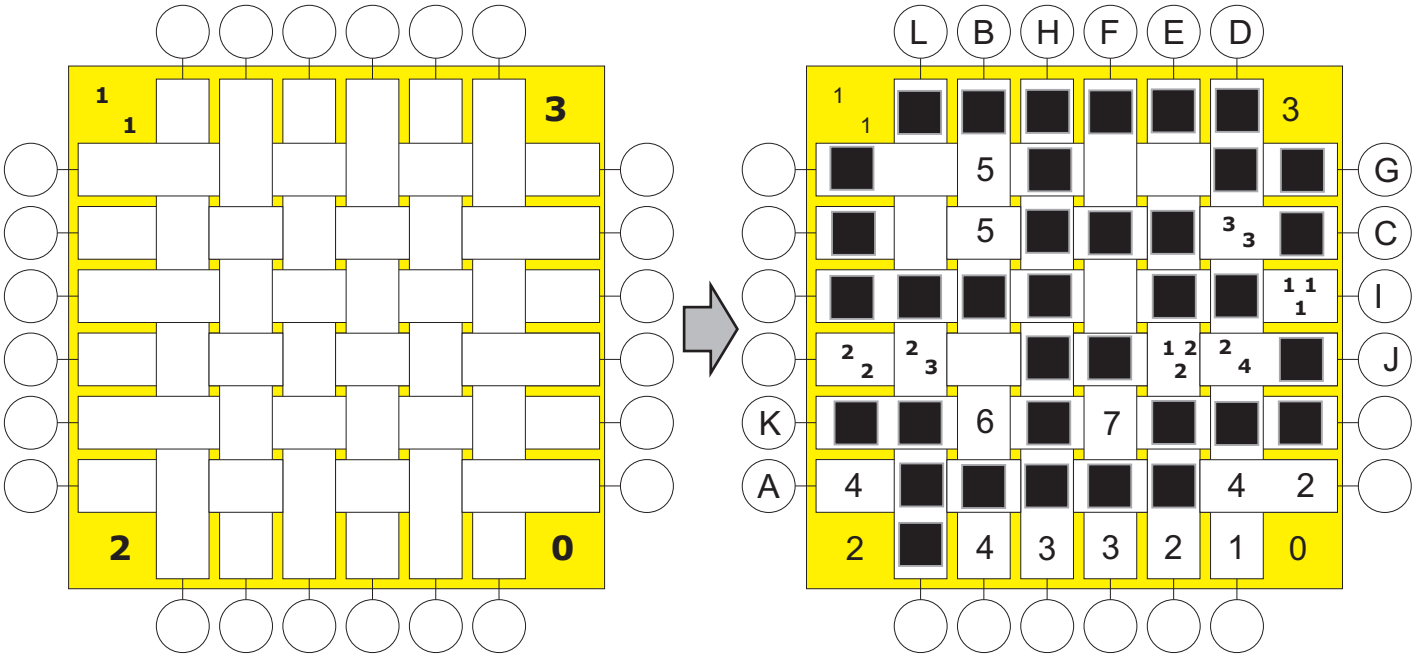


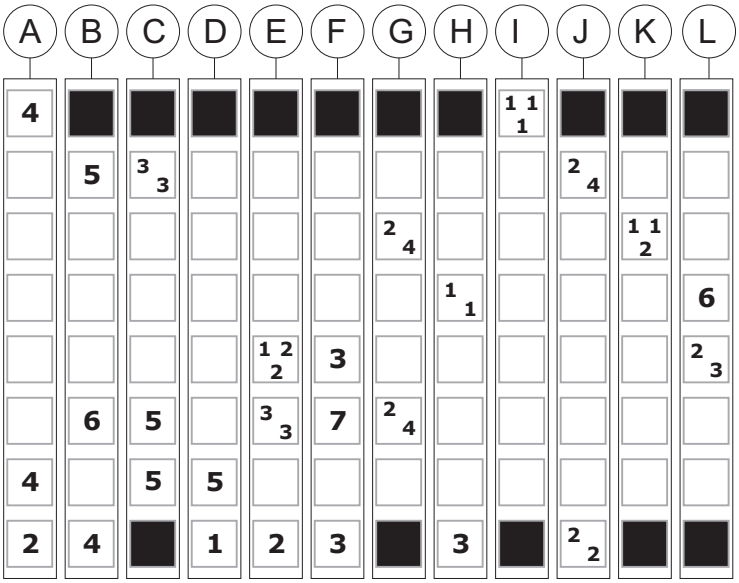
SOLUTIONS

T					G	U	A	V	A
O	O	R	A	N	G	E			A
C			M	A	N	G	O		V
I						G			O
R						R			C
P						A		A	A
A	H	C	A	E	P	P		P	D
A	Y	A	P	A	P	E		P	O
			N	O	M	E	L	L	
	N	O	L	E	M			E	



Kashmir carpet





Interweave mixed ribbons with each other so, that you get a carpet with correct tapa-puzzle solution. Both ends of ribbons and some possible clues in middle are given, (white square means simply that there is not known, is this cell painted or not) but not all innere clues are true and they may be coverted by other ribbons in finished carpet. You may turn ribbons in every way, if needed.

Tapa rules: Paint some cells black to create a continous wall. Painted cells can not form a 2x2 square or larger. There are no wall segments on cells containing numbers. Number in the grid indicate the lenght of painted cell blocks on its neighbouring cells.