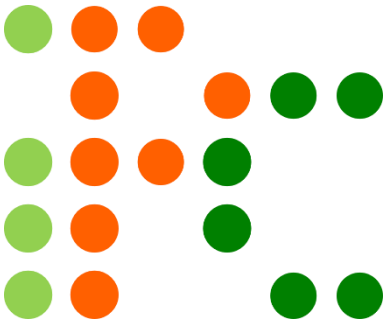
2024 Indian Puzzle Championship

Instructions Booklet

10th August 2024, Bangalore



puzzle ramayan

Round Composition at a glance (puzzle names are in bold):

Round 1:

PR Again

12 puzzles

X minutes

Points: X

Puzzles	Points
Skyscrapers (Classics)	X
Liar Loop (Classics)	X
Geradeweg (Loops)	X
Doppelblock (Numbers)	X
Yajilin (Evergreens)	X
Regional Loop (MII)	X
Scrabble (Word)	X
Star Battle (Object Placement)	X
Cave (Shading)	X
Five Cells (Regions)	X
Snake (First Seen) (Snake)	X
Jigsaw Loop (Casual)	X
Total	X

Round 2:

Optimal Logic

12 puzzles

X minutes

Points: X

Puzzles	Points
Slitherlink (Classics)	X
Battleships (Classics)	X
Castle Wall (Loops)	X
Skyscrapers (Numbers)	X
Magnets (Evergreens)	X
Balance Loop (MII)	X
Words In Order (Word)	X
Pentopia (Object Placement)	X
Tapa (Shading)	X
Fillomino (Regions)	X
Snake (Regions) (Snake)	X
Mastermind (Casual)	X
Total	X

Round 3:

This Is Not ISC

13 puzzles

X minutes

Points: X

Puzzles	Points
Choco Banana (Even/Odd)	X
Nanro (Nonconsecutive)	X
Snake (Clone)	X
Snake (Clone)	X
Doppelblock (Killer)	X
Fillomino (X-Sums)	X
Tapa (Palindrome)	X
Cave (Quadruples)	X
Maxi Loop (Extra Regions)	X
Meandering Words (Tight Fit)	X
Square Jam (Inequality)	X
Pentominous (Thermo)	X
Mastermind (XV)	X
Total	X

Round 4:

Hangover

9 puzzles

X minutes

Points: X

Puzzles	Points
Criss Cross	X
Black Hole	X
Alphabet Bank	X
M-A-Z-E	X
Spy Sudoku	X
Jigsaw Word Find	X *partial points available
Orienteering	X
Domino Bank	X
Domino Bank	X
Total	X

Acknowledgments:

LMI Thanks the following puzzlers for their involvement in putting this competition together

Rounds 1-3 –

Authors: Chandrachud Nanduri (India), Chiel Beenhakker (Netherlands), David Altizio (USA), Jeffrey Bardon (USA), Madhav Sankaranarayanan (India), Mark Sweep (Netherlands), Martin Ender (Germany), Prasanna Seshadri (India), Swaroop Guggilam (India), Wessel Strijkstra (Netherlands)

Curator/Editor: Prasanna Seshadri (India)

Testers: Chiel Beenhakker, Jeffrey Bardon, Mark Sweep, Prasanna Seshadri, Ken Endo (Japan), Walker Anderson (USA), Aubin Danzo (France)

Round 4 –

Author & Editor: Tawan Sunathvanichkul (Thailand)

Testers: Prasanna Seshadri, Ken Endo, Walker Anderson, Aubin Danzo

Tie Breakers & Bonus Points:

- In case of a tie, the participant with the higher score in Round 3 will rank higher. If there is still a tie, we will look at Round 2, then Round 1. If there is still a tie, a tie-breaker puzzle will be used if the position in question is relevant to the team selection positions or the Puzzle Ramayan playoffs.
- If all puzzles are solved correctly in a round, the participant will score an additional 10 points per minutes saved.

Schedule

Time	Activity
9:00-9:30	Completing registration
9:30-10:15	Q & A
10:30-X	Round 1
X-X	Round 2
X-X	Lunch
X-X	Round 3
X-X	Round 4
X-X	Fun Event
X-X	PR Playoffs
X-18:00	Results & Prize Distribution

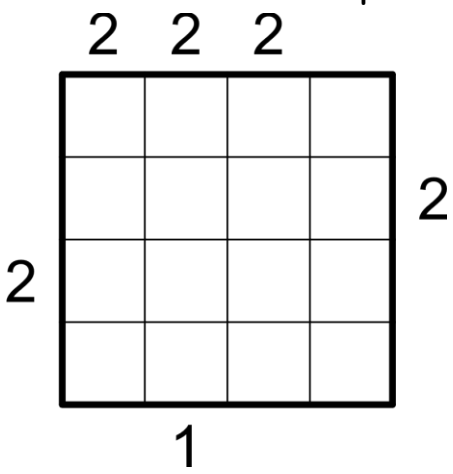
Round 1: PR Again

Round Description: This round contains puzzle genres that were seen over the course of the Puzzle Ramayan online rounds. Their respective categories are mentioned in brackets. In case of Made In India, we have also specified the original inventor.

1 Skyscrapers (Classics)

X points

Insert a digit from 1 to N into each cell in the N by N grid so that no digit repeats in any row or column. Also, each number in the grid represents the height of a building and the clues on the outside of the grid indicate how many buildings can be "seen" when looking from that direction. Taller buildings block the view of smaller buildings.



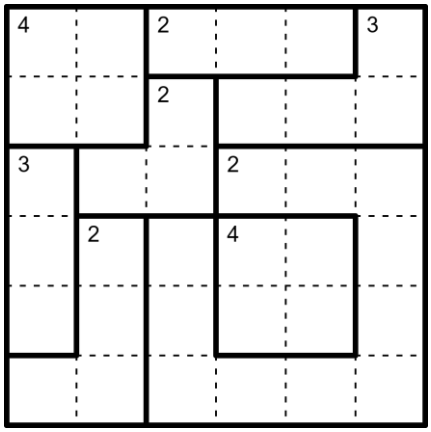
2 Liar Loop (Classics)

X points

Draw a non-intersecting loop traveling orthogonally through the centers of all cells.

A number in a region indicates that the loop never runs through this many cells consecutively. Whenever it passes through the area it always runs through either more or less cells than the given number before exiting.

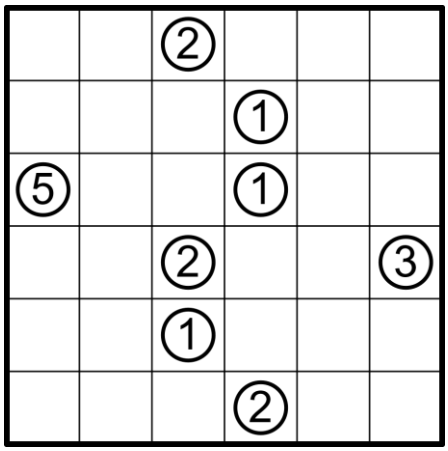
Note: This is a variant of the Classic genre 'Maxi Loop'. Both classic as well as variant appeared in the corresponding PR Round.



3 Geradeweg (Loops)

X points

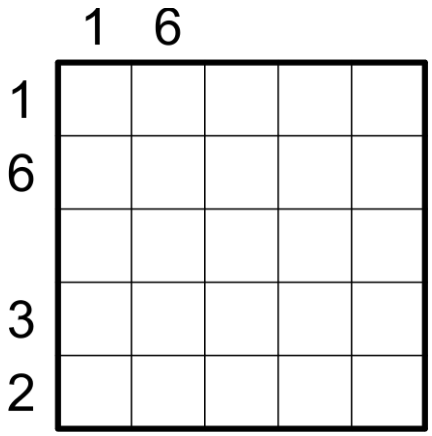
Draw a non-intersecting loop through the centers of some cells that passes through every clue. Every straight line segment that touches a clue must have a length equal to the clue's value.



4 Doppelblock (Numbers)

X points

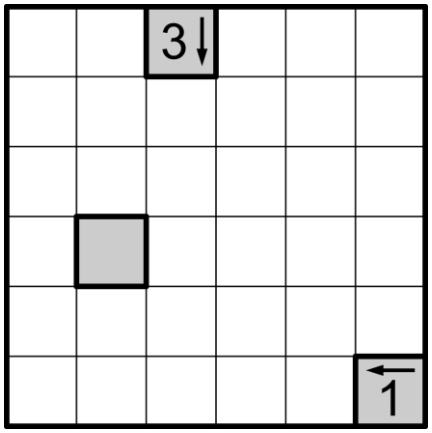
Place a number from 1 to N-2 into some cells so that each row and column contains every number from that range with no repeats, where N is the side length of the grid, and shade the remaining two cells of each row and column. A clue outside the grid indicates the sum of the digits which appear between the two shaded cells in the corresponding row or column.



5 Yajilin (Evergreens)

X points

Shade some cells and then draw a single closed loop (without intersections or crossings) through all remaining white cells. Shaded cells cannot share an edge with each other. Some cells are outlined and in gray and cannot be part of the loop, but aren't counted as 'shaded' either. Numbered arrows in such cells indicate the total number of shaded cells that exist in that direction in the grid.

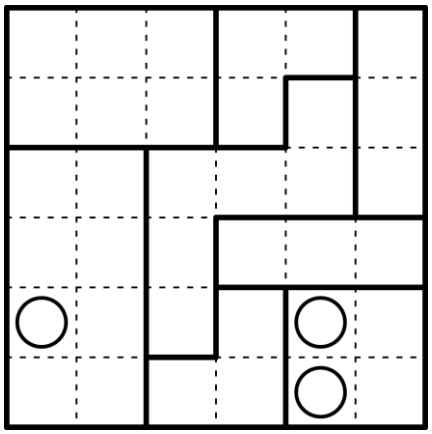


6 Regional Loop

(MII – Invented by Swaroop Guggilam)

X points

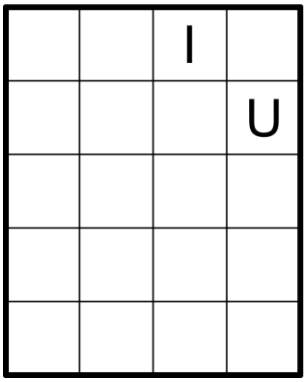
Draw a non-intersecting loop through the centers of some cells which passes straight through all cells with circles. The loop must turn exactly the same number of times in every region that it visits. This number must be determined by the solver.



7 Scrabble (Word)

X points

Place all the listed words exactly once in the grid going across (left to right) or down (top to bottom). Each word intersects with at least one other word and all words are interconnected. No words of two or more letters can appear anywhere in the grid, except the ones listed. Some letters are given.



MUM

RAM

DORM

MAIM

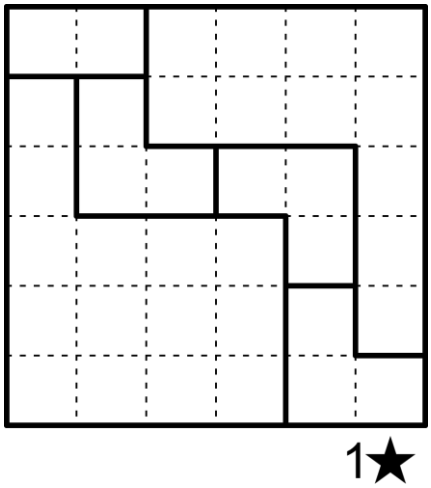
MEME

MADAM

8 Star Battle (Object Placement)

X points

Place a star in some empty cells so that each row, column, and bold region contains the indicated number of stars. Stars cannot be placed in adjacent cells that share an edge or corner.



9 Cave (Shading)

X points

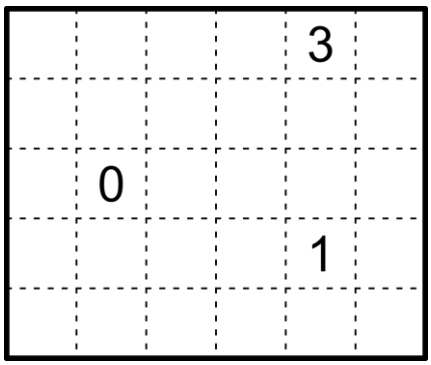
Shade some cells so that the shaded cells are all connected orthogonally by other shaded cells to the edge of the grid, and the remaining unshaded cells form one orthogonally connected area. Clues cannot be shaded, and represent the total number of unshaded cells that can be seen in a straight line vertically or horizontally, including itself.

	3			2	
2					3
	3			2	
3					4

10 Five Cells (Regions)

X points

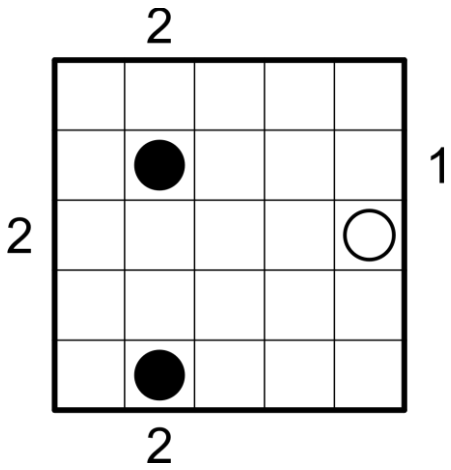
Divide the grid into regions of five orthogonally connected cells. Clues represent the number of edges drawn surrounding the clue (up to four).



11 Snake (First Seen) (Snake)

X points

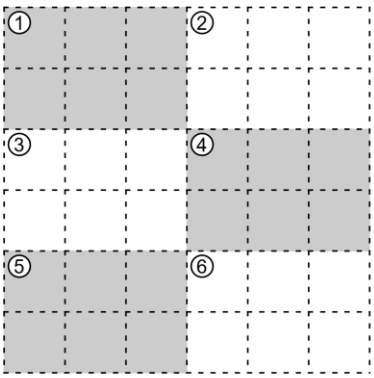
Shade some cells to form a non-intersecting path of 1-cell width which does not touch itself, not even diagonally. A black circle must lie on an end of the path. A white circle must lie somewhere along the path, but not at an end.
A number outside the grid represents the number of cells in the first shaded block from the clue in the corresponding row or column.



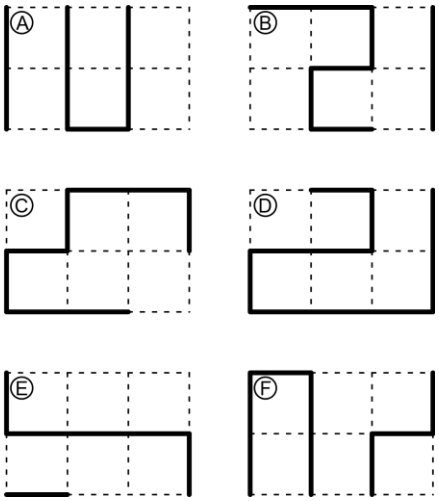
12 Jigsaw Loop (Casual)

X points

Reconstruct a closed loop from the pieces given on the right, that does not cross itself. The cells of pieces cannot overlap each other but the loop segments can. The pieces cannot be rotated or reflected. All loop segments are given, and represented on every piece.



Answer:

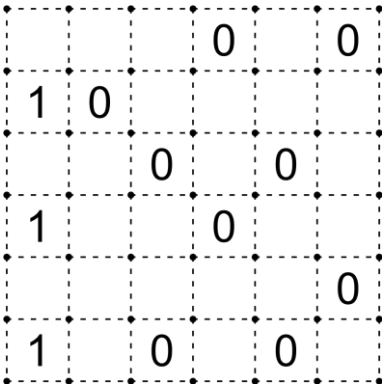


Round 2: Optimal Logic

Round Description: Each puzzle is a **logical optimizer**. This means there is an added rule specified, requiring an element of the solution to be minimized or maximized. There is a unique solution if the given optimization is done, whereas there may be multiple solutions without it. Only the unique optimized solution will be graded as correct.

1 Slitherlink (Classics)

X points



Connect some pairs of orthogonally adjacent dots to form a single non-intersecting loop. Clues represent the number of edges drawn surrounding the clue (up to four).

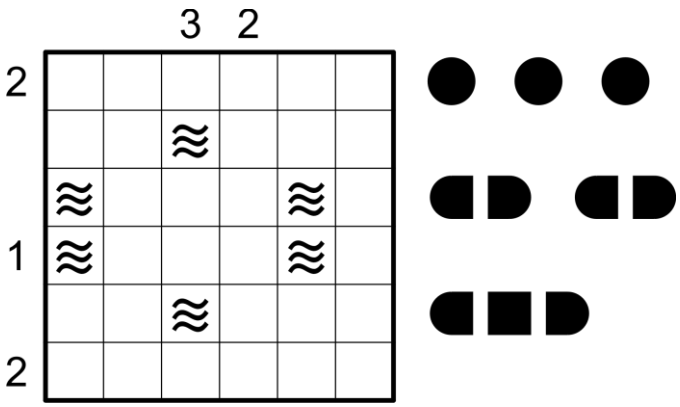
Optimization: Minimize the number of 3s if clues were added for the un-clued cells.

2 Battleships (Classics)

X points

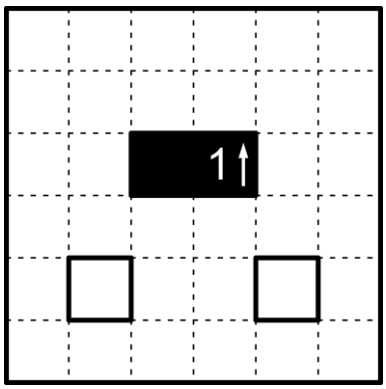
Place the given fleet of ships into the grid so that no two ships are touching, not even diagonally. Rotating ships is permitted. A clue outside the grid indicates the number of cells in the corresponding row or column that are occupied by ships. Cells with waves cannot be occupied by a ship. A given ship segment must be used as the part of a ship that its shape represents.

Optimization: Maximize the number of horizontally oriented ships.



3 Castle Wall (Loops)

X points

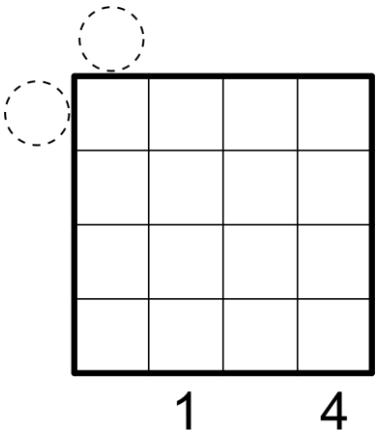


Draw a non-intersecting loop through the centers of some cells. The loop may not enter outlined cells or cells containing clues. White cells with outlines must lie inside the loop, while black cells with outlines must lie outside the loop. A number represents the sum of the lengths of loop segments in the indicated direction.

Optimization: Minimize the number of cells visited by the loop.

4 Skyscrapers (Numbers)

X points

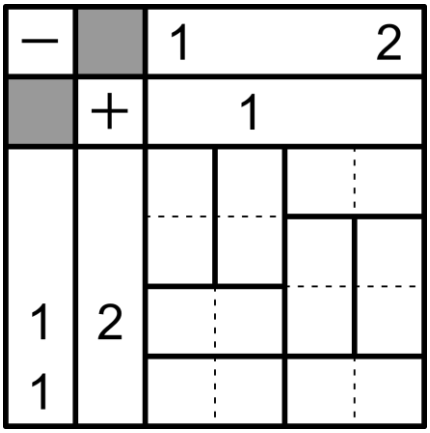


Place a number from 1 to N into each cell so that each row and column contains every number from that range with no repeats, where N is the side length of the grid. A clue outside the grid represents how many cells in the corresponding row or column contain a larger number than all cells before it in that row or column from the direction of the clue.

Optimization: Maximize the total of the missing clues in the given circles.

5 Magnets (Evergreens)

X points



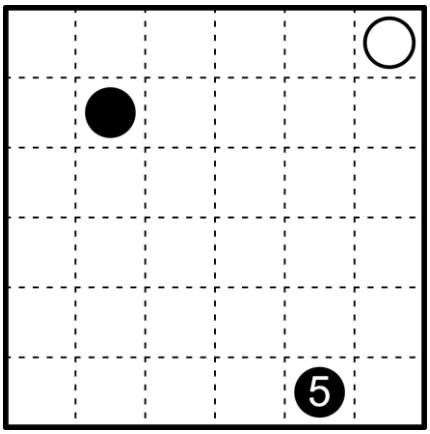
Place pluses and minuses into some cells such that the numbers outside the grid equate to how many of the indicated symbol appear in the corresponding row or column. An outlined domino either contains no pluses and no minuses, or one cell with a plus and one cell with a minus. No two symbols of the same type may appear in orthogonally adjacent cells.

Optimization: Maximize the number of cells containing pluses and minuses.

6 Balance Loop

(MII – Invented by Prasanna Seshadri)

X points



Draw a non-intersecting loop through the centers of some cells that passes through every circle. The straight line segments coming out of a white circle must have equal length, while the straight line segments coming out of a black circle must have different lengths. A clue in a circle represents the sum of the lengths of these two line segments.

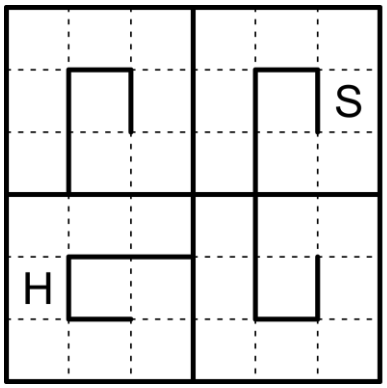
Optimization: Maximize the total clue value of blank circles.

7 Words Snails (Word)

X points

Write each word from the list into a different snail, entering letters in order starting from the outside of the snail going spirally inward. Some cells remain unused. A "-" in a cell means that it must remain unused. A letter cannot appear more than once in any row or column of the full grid.

Optimization: Minimize the largest orthogonally connected area of unused cells.



HELLO

THANKS

HAKKA

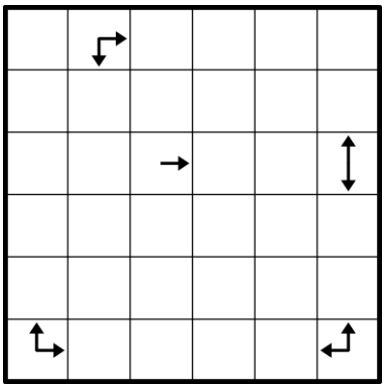
BYEBYES

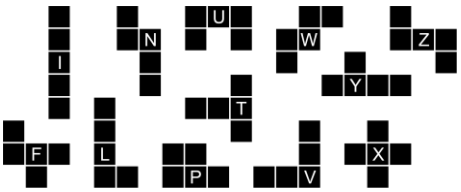
8 Pentopia (Object Placement)

X points

Shade some pentominoes of cells so that no pentominoes touch one another, not even diagonally. No two shaded pentominoes may be the same shape, counting rotations and reflections as the same. Clued cells cannot be shaded, and contain arrows indicating all of the orthogonal directions which tie for having a shaded cell appearing closest to the clued cell. At least one shaded cell must appear in the direction of an arrow.

Optimization: Minimize the total number of unshaded cells in the directions of arrow clues before the first shaded cell.



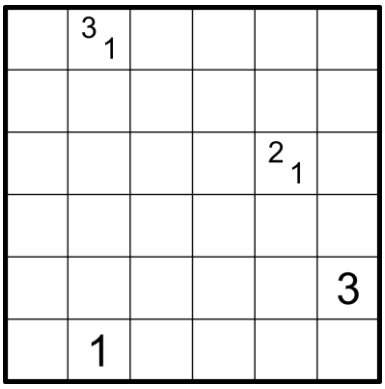


9 Tapa (Shading)

X points

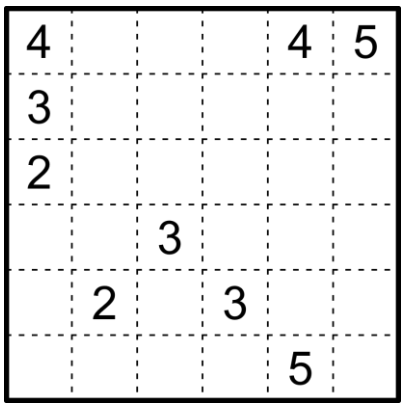
Shade some cells so that all shaded cells form one orthogonally connected area and no 2x2 region is entirely shaded. Clues cannot be shaded, and represent the lengths of the blocks of consecutive shaded cells in the (up to) eight cells surrounding the clue.

Optimization: Maximize the number of shaded cells.



10 Fillomino (Regions)

X points

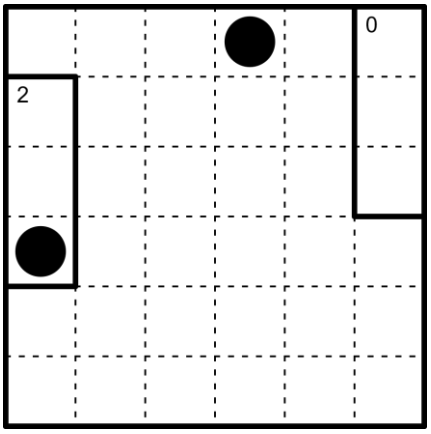


Divide the grid into regions of orthogonally connected cells. Two regions of the same size may not share an edge. Clued cells must belong to a region containing the indicated number of cells.

Optimization: Maximize the number of rectangular regions.

11 Snake (Regions) (Snake)

X points

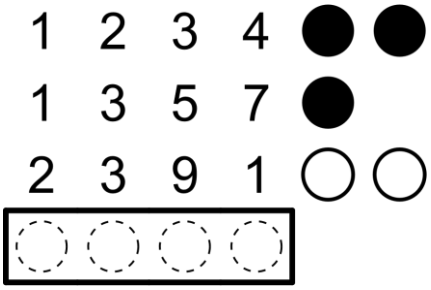


Shade some cells to form a non-intersecting path which does not touch itself, not even diagonally. Circles mark the ends of the path. Regions with numbers must contain the indicated amount of shaded cells.

Optimization: Maximize the length of the snake.

12 Mastermind (Casual)

X points



Find the secret answer. Some guesses have been given. There are clues next to each guess. A black circle indicates a correct digit in the correct position. A white circle indicates a correct digit in the wrong position. Digits cannot repeat in the answer and guesses. In all cases, black circles take precedence over white circles.

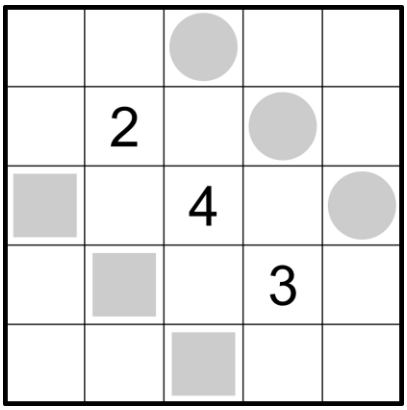
Optimization: Maximize the answer.

Round 3: This Is Not ISC

Round Description: This round has 13 puzzles. Each puzzle is a variant of a regular genre. The variant concepts used are popular concepts usually seen with Sudoku.

1 Choco Banana (Even/Odd)

X points

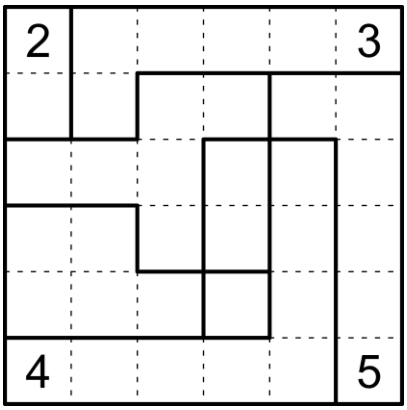


Choco Banana: Shade some cells so that all areas of orthogonally connected shaded cells are rectangular and all areas of orthogonally connected unshaded cells are not rectangular. A clue represents the size of its group of shaded/unshaded cells.

Even/Odd: Cells with shaded squares contain even digits. Cells with shaded circles contain odd digits.

2 Nanro (Non-Consecutive)

X points

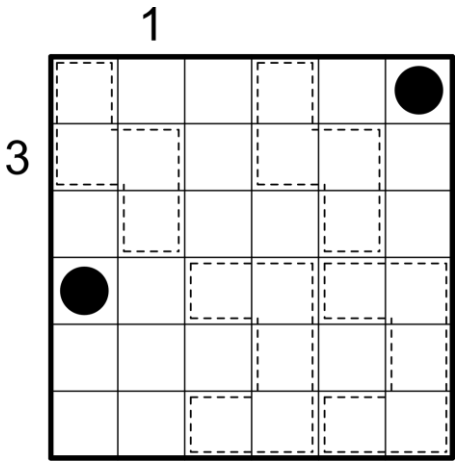


Nanro: Place a number into some cells so that all cells with numbers form one orthogonally connected area and no 2x2 region is entirely numbered. Each region must contain at least one numbered cell, and every number in the region must be equal to how many numbered cells the region contains. Two cells containing the same number may not share a region border.

Non-Consecutive: Digits in adjacent cells must not be consecutive.

3-4 Snake (Clone)

X+X points

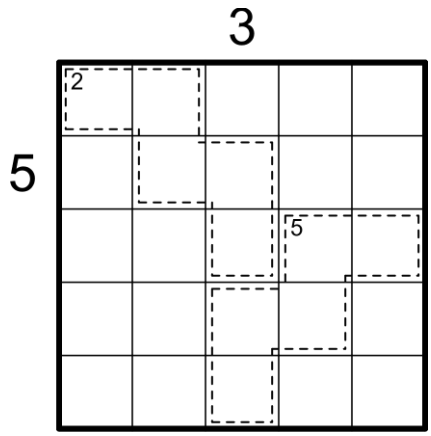


Snake: Shade some cells to form a non-intersecting path which does not touch itself, not even diagonally. Black circles must lie on one end of the path. White circles must lie somewhere along the path, but not at an end. A number outside the grid represents how many cells in the corresponding row or column are shaded.

Clone: Dotted cages forming a pair (i.e. same shape in the same orientation) must have the same shading pattern.

5 Doppelblock (Killer)

X points

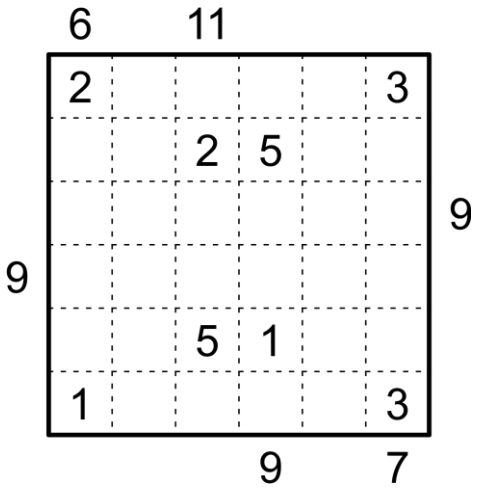


Doppelblock: Place a number from 1 to N-2 into some cells so that each row and column contains every number from that range with no repeats, where N is the side length of the grid, and shade the remaining two cells of each row and column. A clue outside the grid indicates the sum of the digits which appear between the two shaded cells in the corresponding row or column.

Killer: The number at the top-left corner of each cage is the sum of digits inside the cage. Digits do not repeat within a cage.

6 Fillomino (X-Sums)

X points

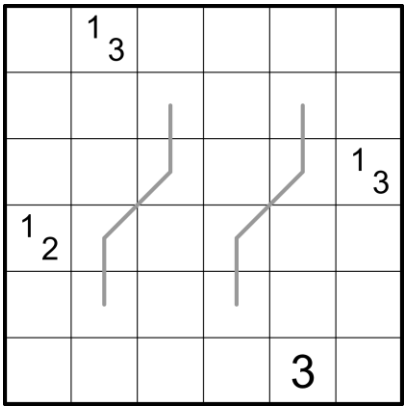


Fillomino: Divide the grid into regions of orthogonally connected cells. Two regions of the same size may not share an edge. Clued cells must belong to a region containing the indicated number of cells.

X-Sums: Each number outside the grid is the sum of the first X numbers placed in the corresponding direction, where X is the first digit placed in that direction.

7 Tapa (Palindrome)

X points



Tapa: Shade some cells so that all shaded cells form one orthogonally connected area and no 2x2 region is entirely shaded. Clues cannot be shaded, and represent the lengths of the blocks of consecutive shaded cells in the (up to) eight cells surrounding the clue.

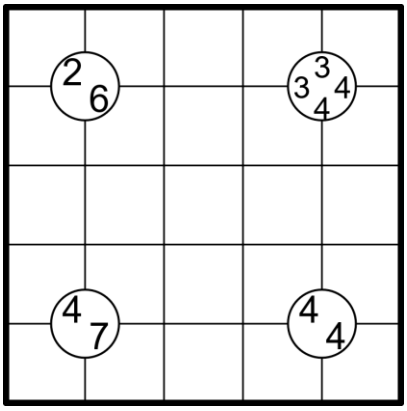
Palindrome: Shaded cells along each line are a palindrome, they read the same from both directions.

8 Cave (Quadruples)

X points

<u>Cave:</u> Shade some cells so that the shaded cells are all connected orthogonally by other shaded cells to the edge of the grid, and the remaining unshaded cells form one orthogonally connected area. Clues cannot be shaded, and represent the total number of unshaded cells that can be seen in a straight line vertically or horizontally, including itself.

<u>Quadruples:</u> The digits at the intersection of four cells must be present in those four cells at least as many times as they appear in the intersections.

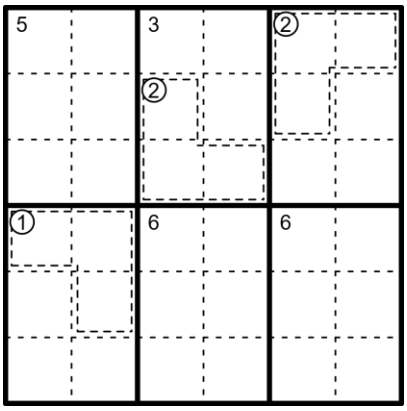


9 Maxi Loop (Extra Regions)

X points

<u>Maxi Loop:</u> Draw a non-intersecting loop through the centers of all cells. A non-circled number in a region represents the number of cells occupied by the largest continuous loop segment within the region.

<u>Extra Regions:</u> Each dotted cage forms a mini-region which has a circled number that represents the number of cells occupied by the largest continuous loop segment within the cage.



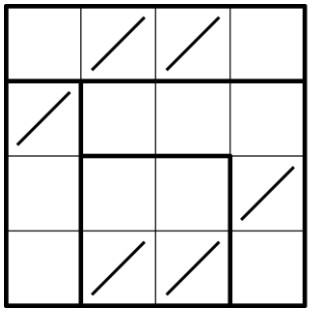
10 Meandering Words (Tight Fit)

X points

<u>Meandering Words:</u> Place a letter into each cell. The letters in a region must form an orthogonally connected chain of letters spelling out one of the words given outside the grid. Each given word must be used. Two instances of the same letter may not appear in adjacent cells, not even diagonally.

<u>Tight Fit:</u> In each cell split into halves, place two consecutive letters along the word. These cells may contain the same letter.

Note: The ordering of the letters within the cell does not matter for scoring.



SPRING

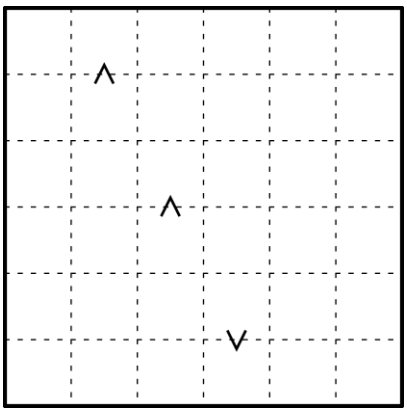
SUMMER

FALL

WINTER

11 Square Jam (Inequality)

X points



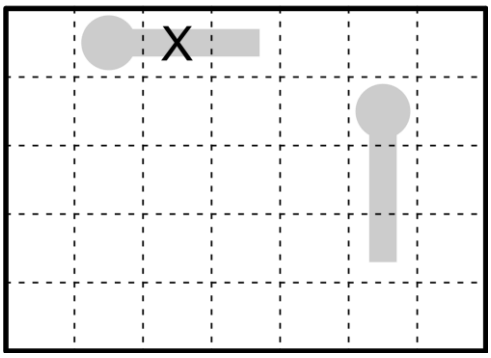
Square Jam: Divide the grid into square regions of orthogonally connected cells. A number indicates the side length of the square it's in. Region borders may not form any four-way intersections.

Inequality: Each inequality sign ('<' or '>') between adjacent cells indicates the larger of the two digits is on the open side of the sign.

12 Pentominous (Thermo)

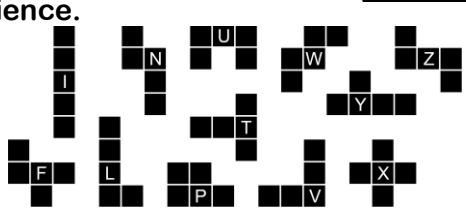
X points

FILNPTUVWXYZ



Pentominous: Divide the grid into regions of five orthogonally connected cells so that no two regions of the same shape share an edge, counting rotations and reflections as the same. Clued cells must belong to a region with the pentomino shape associated with that letter.

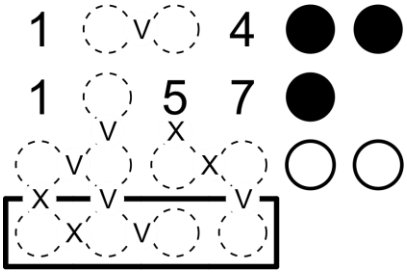
Thermo: Letters along a thermometer are in alphabetical order, strictly increasing in each cell from its bulb to its end. The order is given above the grid, and the pentomino bank is given below the grid, for convenience.



13 Mastermind (XV)

X points

Mastermind: Find the secret answer. Some guesses have been given. There are clues next to each guess. A black circle indicates a correct digit in the correct position. A white circle indicates a correct digit in the wrong position. Digits may repeat in the answer and guesses. If a digit appears twice or more in a guess but only once in the answer, one circle is given. If a digit appears once in the guess but more than once in the answer, one circle is given. In all cases, black circles take precedence over white circles.



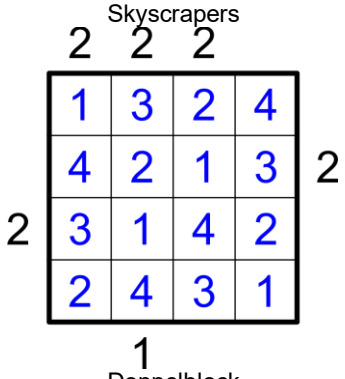
XV: Adjacent cells with digits summing to 5 are marked by V. Adjacent cells with digits summing to 10 are marked by X. All possible V and X are marked.

Note: Round 4 IB will be shared separately.

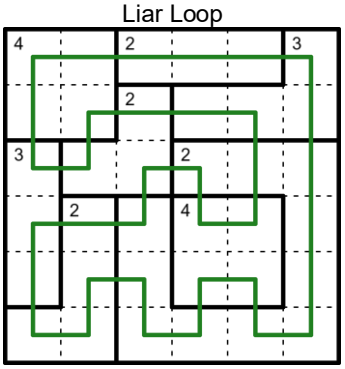
Solutions

Round 1

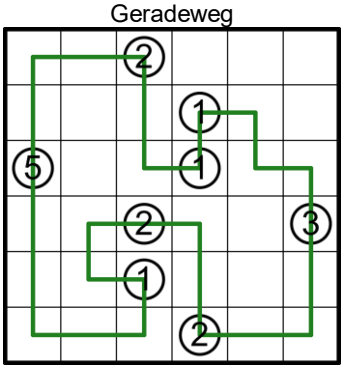
Skyscrapers



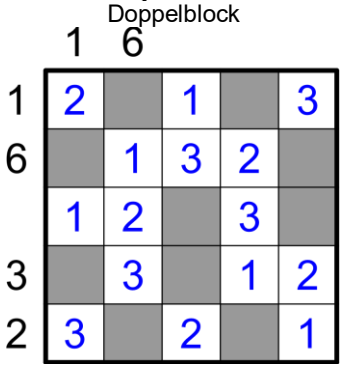
Liar Loop



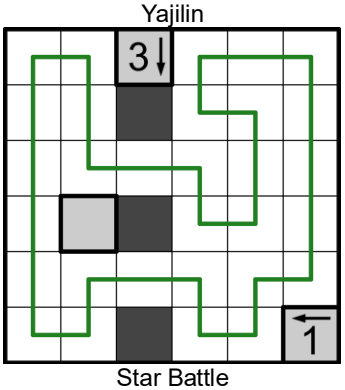
Geradeweg



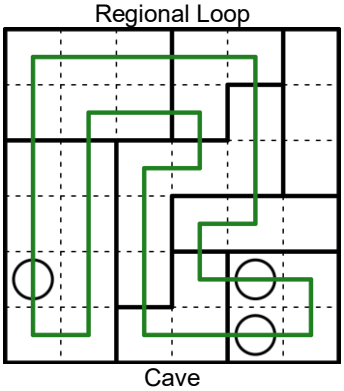
Doppelblock



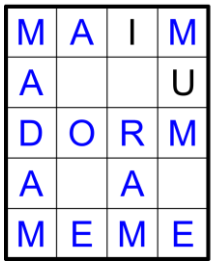
Yajilin



Regional Loop

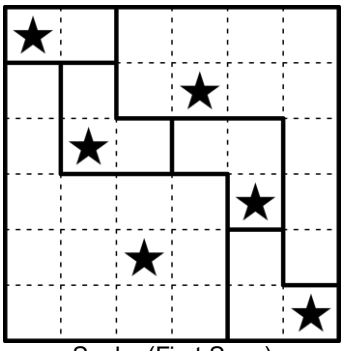


Scrabble

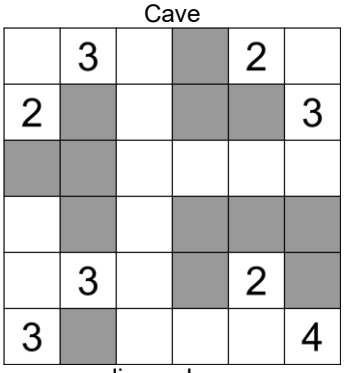


MUM
RAM
DORM
MAIM
MEME
MADAM

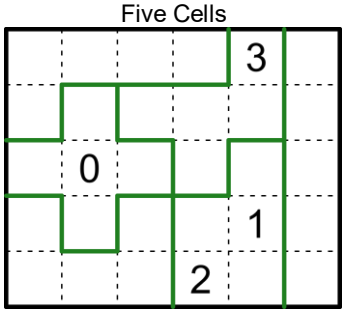
Star Battle



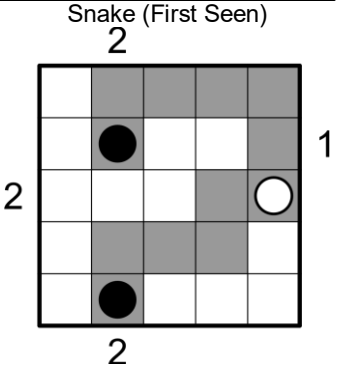
Cave



Five Cells



Snake (First Seen)

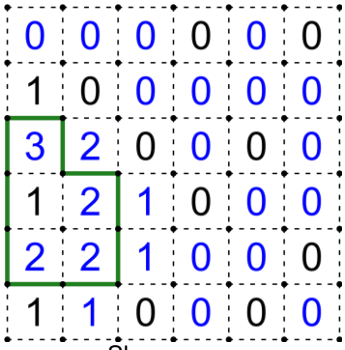


Jigsaw Loop

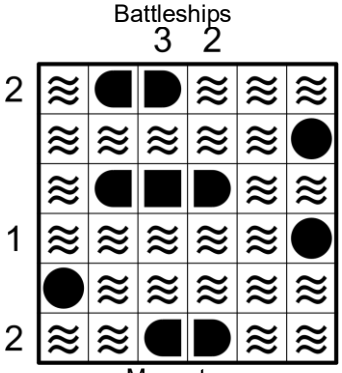
CEBFDA

Round 2

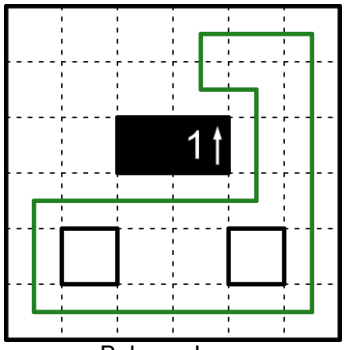
Slitherlink



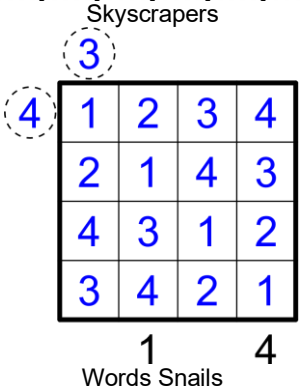
Battleships



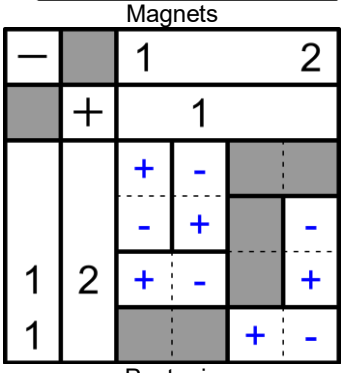
Castle Wall



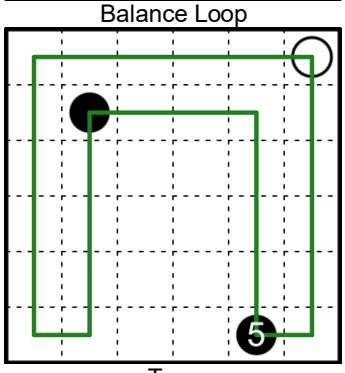
Skyscrapers



Magnets

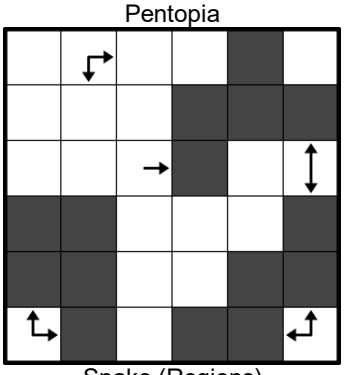


Balance Loop

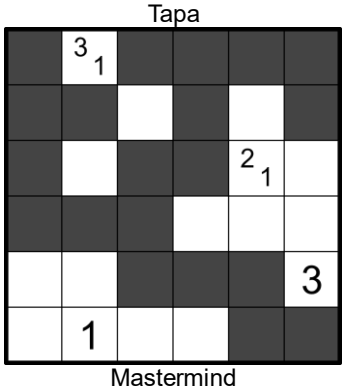


Words Snails

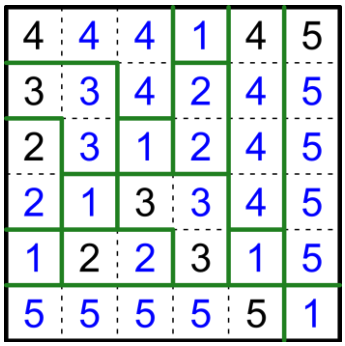
Pentopia



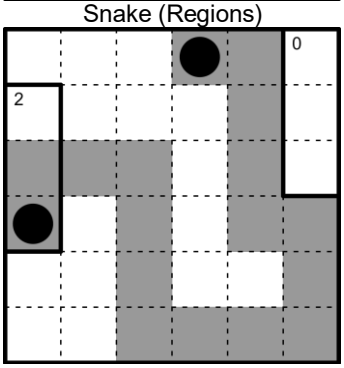
Tapa



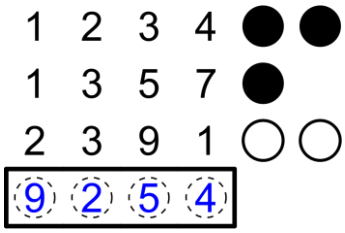
Fillomino



Snake (Regions)



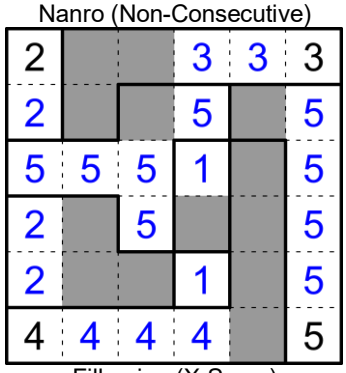
Mastermind



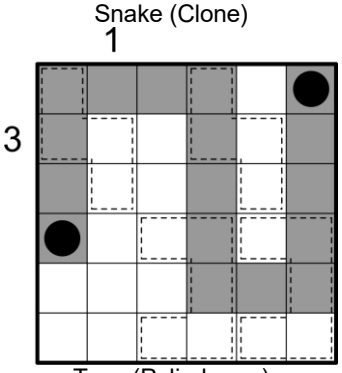
Round 3

Choco Banana (Even/Odd)

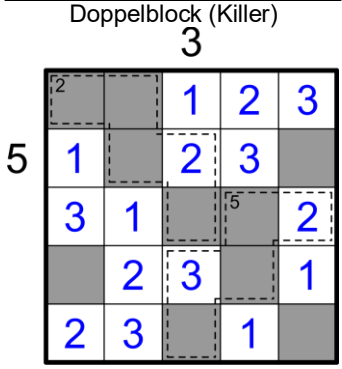
Nanro (Non-Consecutive)



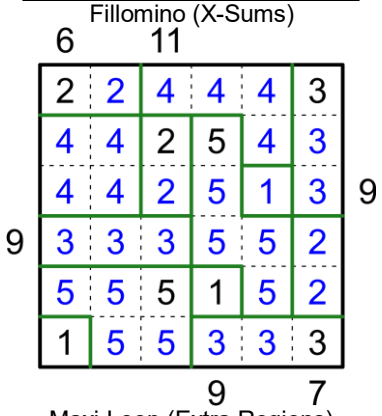
Snake (Clone)



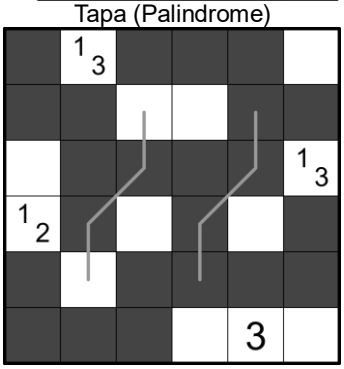
Doppelblock (Killer)



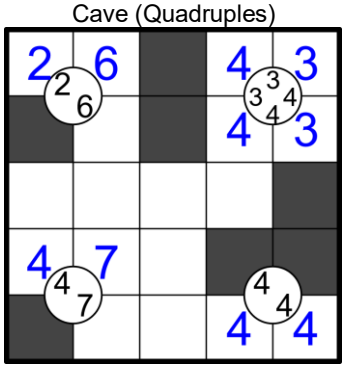
Fillomino (X-Sums)



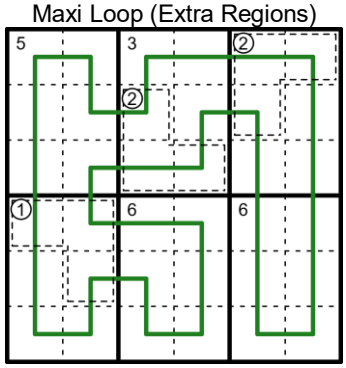
Tapa (Palindrome)



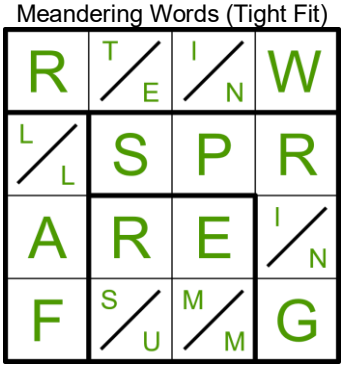
Cave (Quadruples)



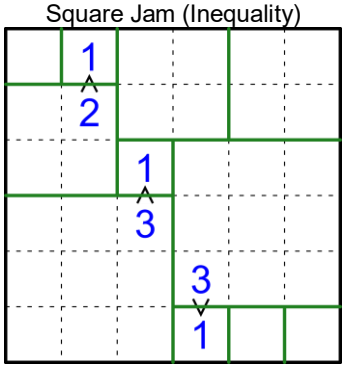
Maxi Loop (Extra Regions)



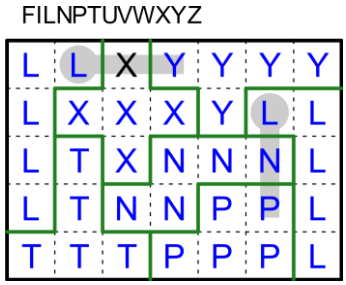
Meandering Words (Tight Fit)



Square Jam (Inequality)



Pentominous (Thermo)



Mastermind (XV)