# We Are **Puzzlers Club**: Part 2 Instructions Booklet
## August 2019 Monthly Puzzle Test on **Logic Masters India**

### Puzzle authors and testsolvers:

**Part 1:** chaotic_iak, edderiofer, Elyot, lovemathboy, ManyPinkHats, rob, TheGreatEscaper
**Part 2: davmillar, Deusovi, IHNN, Kagami Ame, SoftFro, Wen, wormsofcan**
**Other testsolvers:** boboquack, Jack Lance, Jamie Hargrove, phenomist

## History

Welcome! We are Puzzlers Club, and this is our contest.

Puzzlers Club is a Discord-based community of puzzle lovers. We officially formed around 1.5 years ago, when a group of puzzle enthusiasts split from another community that was not specifically about puzzles. Over the time, several well-known logic puzzlers have joined our community, including David Millar, Ivan Koswara, Robert Vollmert, and Tawan Sunathvanichkul.

We have contributed for 24-Hour Puzzle Championship in 2018 and 2019, and we want to expand our contribution to logic puzzling into other communities, hence this test. Although several authors have previously written for LMI independently such as David Millar with *FLIP* (November 2010), Ivan Koswara with *Deception* (May 2013), and Robert Vollmert contributing to *Puzzle Marathon* in 2015 and 2016, this is our first LMI contest organized collectively as a group.

Due to the large number of authors that are interested in contributing, we have a lot of puzzles. As such, we have divided the test into two independent parts. This is the second part; the first part was held last month, in July 2019, as a separate contest.

## Structure

This contest is divided into many small sections, each featuring a single author. Each author has been given (nearly) free reign to write any set of puzzles they wish, so different sections will likely feature very different styles. However, this is still a regular contest; each puzzle correctly solved will score you the corresponding points, regardless of who the author is.

When you solve a puzzle, submit its answer key. **Instant Grading will be enabled**; upon entering an answer, you will immediately know if it's correct or not, and you may fix it if it's incorrect. After 1, 2, 3, and 4 mistakes on a puzzle, the puzzle's score reduces to 90%, 70%, 40%, and 0% of its original score, respectively. (After 4 mistakes or more, the puzzle is not worth anything. But you still need to solve it to claim the bonus.)

The test lasts for **120 minutes**. If you solve all puzzles, you gain a multiplier to your score, equal to 120 minutes / the time you took. For example, if you solve all puzzles in 100 minutes, you gain a multiplier of 120 minutes / 100 minutes = x1.2 to your final score, equivalent to a +20% bonus.

# Points Table

**IHNN**
01. LITS.............................................................30
02. LITS [Different].....................................50
03. Five Cells ...........................................30
04. Five Cells [Noncongruent]..................40

**wormsofcan**
05. Dominosweeper....................................40
06. Triodoko...............................................40
07. Foursight...............................................70

**Wen**
08. Detour...................................................20
09. Detour...................................................30
10. Detour...................................................40

**Deusovi**
11. Heyacrazy ............................................30
12. Heyacrazy ............................................40
13. Heyacrazy ......................................... 100

**SoftFro**
14. Detour [Isometric] ...............................20
15. Cave [Isometric] ..................................40
16. Cross the Streams [Isometric]...........50

**Kagami Ame**
17. Doppelblock..........................................30
18. Wrong Products....................................30
19. Tom/Tom...............................................40

**davmillar (David Millar)**
20. Times Zone ..........................................20
21. Times Zone (by Kagami Ame)............40
22. Times Zone ..........................................70
23. Times Zone ....................................... 100

**Total:**                                    **1000**

# Terminology

Some commonly used terms are ambiguous. For clarity, they are defined here.

Two cells are **"adjacent"** if they share a side. Touching on a corner doesn't count.

Two cells are **"touching"** if they share a corner or a side.

A **"connected region"** of cells only considers adjacency. Two blobs of cells that only touch diagonally are not connected.

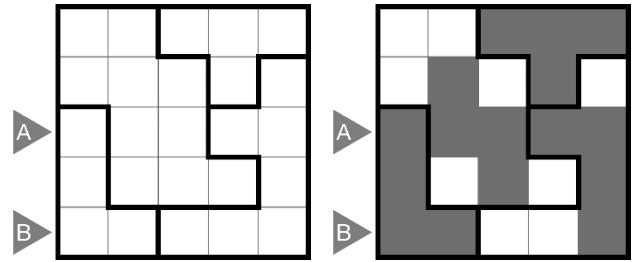A **"loop"** may never intersect or touch itself, unless otherwise stated.

In **answer keys** where you need to enter contents of a row/column: for a row, enter from left to right; for a column, enter from top to bottom. Also, in general, <u>only enter the units digits</u>; if you need to enter a 12, only use the digit 2.

Interested in joining Puzzlers Club? Send an e-mail to <u>puzzlersclubsignups@gmail.com</u>! We're happy to accept people with interest in puzzles.
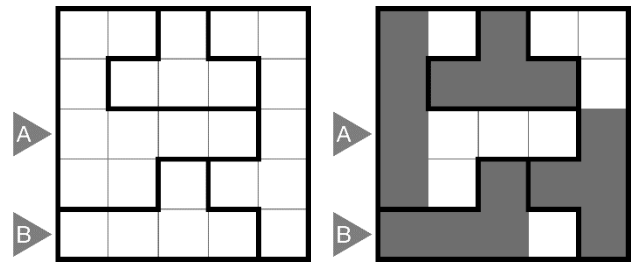
# IHNN

## 01. LITS (30 points)

Shade black a tetromino in each region. All black squares must form a connected region, but no 2x2 area may be fully shaded. Two tetrominoes of the same shape (regardless of orientation) may not be adjacent.

*Answer key:* *Enter the lengths of black segments in the marked rows/columns. If there is no black cell in the row/column, enter the single digit 0.* **Example:** *5, 21*
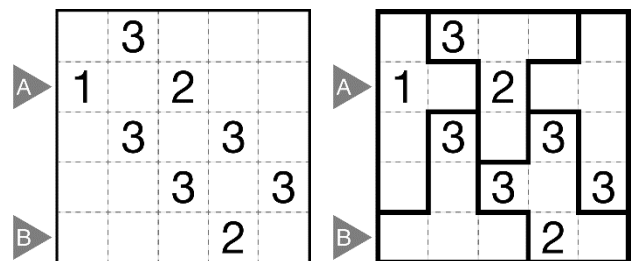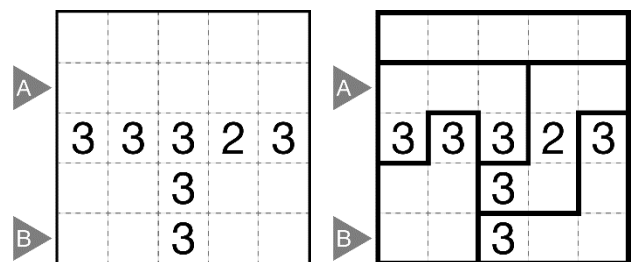
## 02. LITS [Different] (50 points)

Follow regular LITS rules (see puzzle 1). In addition, no two tetrominoes in the grid have the same shape and orientation. (Tetrominoes with the same shape but different orientation may both exist on the grid; of course, they may not be adjacent, as per LITS rules.)

*Answer key:* *Enter the lengths of black segments in the marked rows/columns. If there is no black cell in the row/column, enter the single digit 0.* **Example:** *11, 31*

## 03. Five Cells (30 points)

Divide the grid into regions of five cells each, by drawing segments along the gridlines. Each number in a cell gives the number of drawn segments adjacent to it, including the border of the grid.

*Answer key:* *Enter the lengths of cell segments separated by region borders in the marked rows/columns.* **Example:** *212, 32*

## 04. Five Cells [Noncongruent] (40 points)

Follow regular Five Cells rules (see puzzle 3). In addition, no two regions have the same shape (regardless of orientation).

*Answer key:* *Enter the lengths of cell segments separated by region borders in the marked rows/columns.* **Example:** *32, 23*
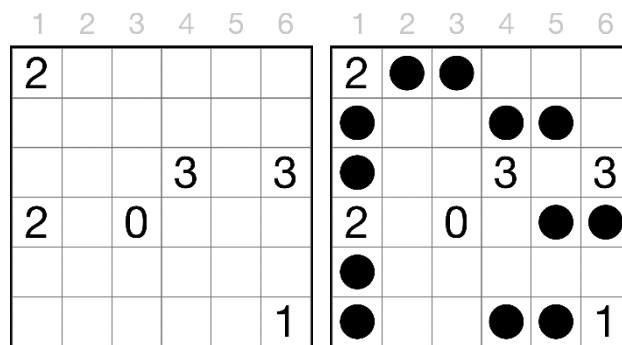
# wormsofcan

## 05. Dominosweeper (40 points)

Place mines in some cells of the grid. Each mine occupies one cell, and each cell has at most one mine. Each cell with a number may not contain any mine; its number gives the number of mines among the (up to 8) cells touching it. In addition, each mine is adjacent to exactly one other mine.

**Note:** This is a Minesweeper variant where mines come in sets of two.

**Answer key:** *For each row from top to bottom, enter the column number of the first mine in the row. If there is no mine in a row, enter the digit 0 for that row.* **Example:** *211511*

## 06. Triodoko (40 points)

Shade some cells black on the grid. Black cells come in groups of three. Different groups of black cells may not be adjacent to each other. The remaining white cells must form a connected region. Cells with circles may not be shaded. Each number gives the number of cells visible to it, where a cell is visible to another if they are in the same row/column and all cells between them are not shaded. A cell is visible to itself.

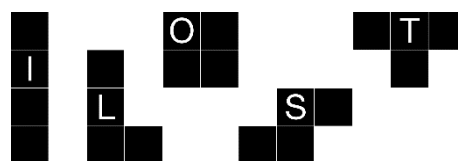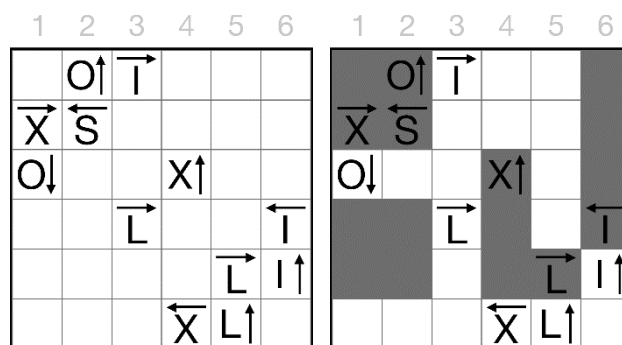**Note:** This is a Kurodoko variant where black cells come in sets of three.

**Answer key:** *For each row from top to bottom, enter the column number of the first black cell in the row. If there is no black cell in a row, enter the digit 0 for that row.* **Example:** *025104*

## 07. Foursight (70 points)

Shade black some tetrominoes on the grid. Tetrominoes may be rotated and/or reflected. Tetrominoes may not be adjacent to each other. The remaining white cells must form a connected region. Cells with clues may be shaded. Each unshaded clue gives the shape of the first tetromino seen in the given direction, or X if there is no such tetromino. Clues that end up shaded are irrelevant and may or may not be true.

**Answer key:** *For each row from top to bottom, enter the column number of the first black cell in the row. If there is no black cell in a row, enter the digit 0 for a row.* **Example:** *114110*
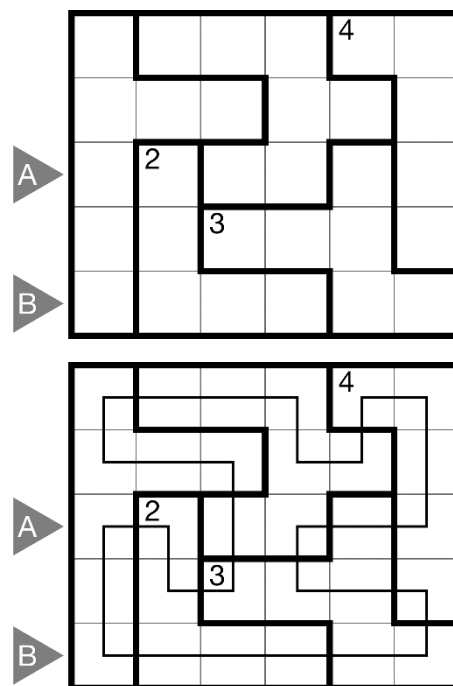
# Wen

## 08. Detour (20 points)

## 09. Detour (30 points)

## 10. Detour (40 points)

Draw a loop on the cells of the grid, passing through all cells. Each number in a region indicates the number of times the loop turns in the region.

*Answer key:* *Enter the lengths of loop segments in the marked rows/columns. If there is no loop segment in the row/column, enter the single digit 0.* **Example:** *12, 5*
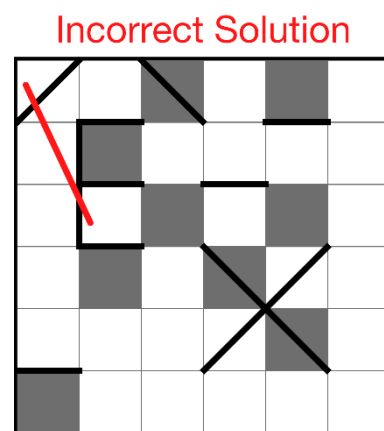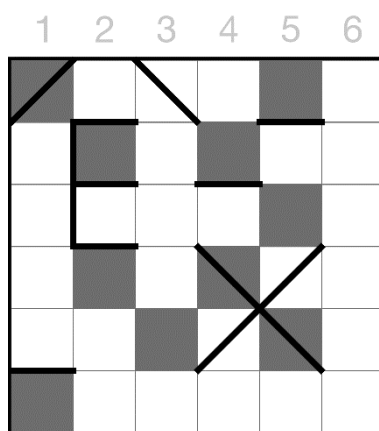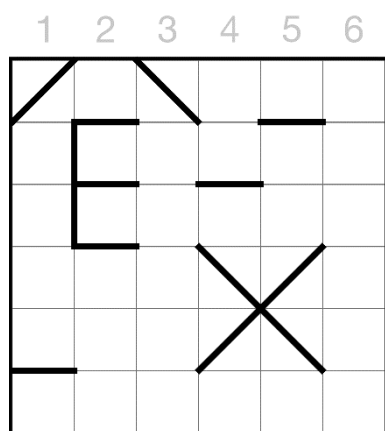
# Deusovi

## 11. Heyacrazy (30 points)

## 12. Heyacrazy (40 points)

## 13. Heyacrazy (100 points)

Shade some cells black. Shaded cells may not be adjacent. All white cells must form a single connected region. Any line segment, <u>in any direction</u> (not just the cardinal directions), that doesn't pass through any grid point or black square, may not completely cross two or more bold borders.

**Note:** If you are familiar with Heyawake, the "no line crosses two borders" condition is retained here, but generalized to arbitrary direction. There are no number clues.

*Answer key:* *For each row from top to bottom, enter the column number of the first black cell in the row. If there is no black cell in a row, enter the digit 0 for that row.* **Example:** *125231*
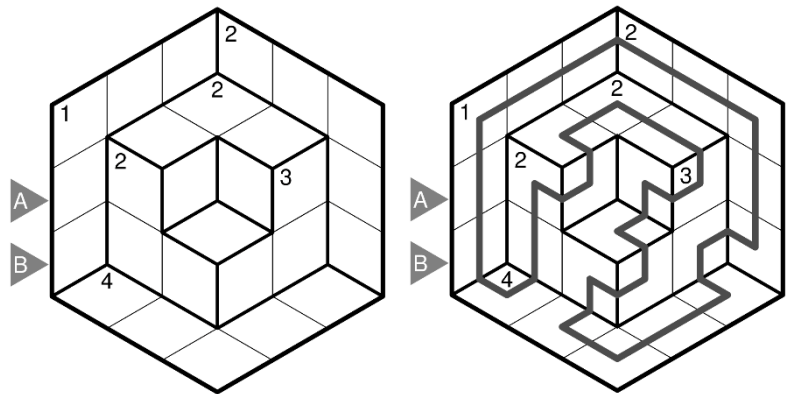
# SoftFro

All puzzles in this section are isometric. The cells are diamonds in various orientations, rather than squares. Rows and columns are generalized into "lines": a path of cells going from one side to another, going through opposite sides of cells.

## 14. Detour [Isometric] (20 points)

The grid is isometric. Draw a loop on the cells of the grid, passing through all cells. Each number in a region indicates the number of times the loop turns in the region.

***Answer key:*** *Enter the lengths of loop segments in the marked lines.*
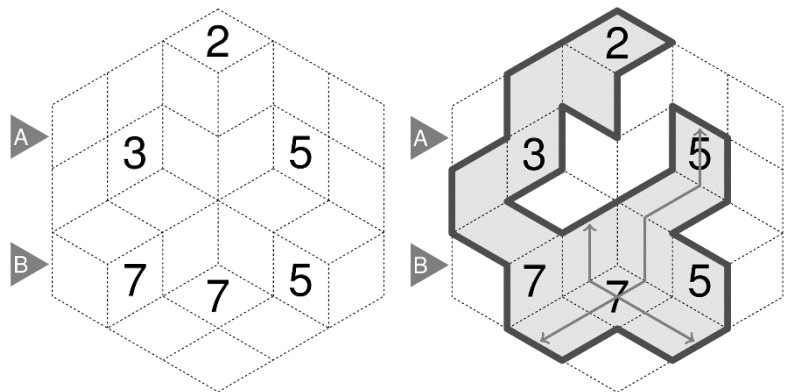***Example:*** *11, 11*

## 15. Cave [Isometric] (40 points)

The grid is isometric. Draw a loop on the gridlines. (The gridlines are marked by dashes.) Cells with numbers must be inside the loop. Each number gives the number of cells visible to it, where a cell is visible to another if and only if they are in the same line and all cells between them are in the loop. A cell is visible to itself.
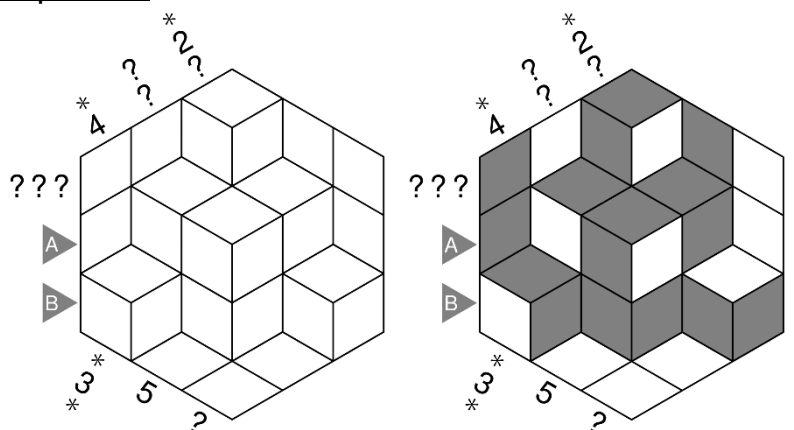
**Note:** The arrows in the example solution show which cells are seen by the middle 7.

***Answer key:*** *Enter the lengths of cells inside the loop in the marked lines.* ***Example:*** *2, 4*

## 16. Cross the Streams [Isometric] (50 points)

The grid is isometric. Shade some cells black. All black cells must form a connected region. No internal vertex is completely surrounded by black cells. Each clue gives the lengths of black cells in the corresponding line. A question mark (?) stands for an unknown number. An asterisk (*) stands for any number of unknown numbers, including none at all.
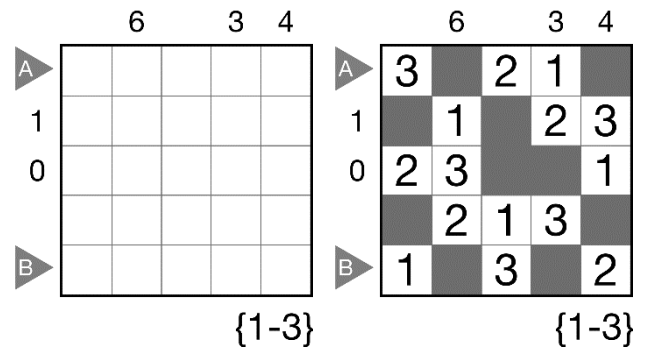
***Answer key:*** *Enter the lengths of black segments in the marked lines. If there is no black cell in the line, enter the single digit 0.* ***Example:*** *111, 5*

# Kagami Ame

**Important:** For answer keys, only enter the units digits; if you need to enter a 12, only enter the digit 2.
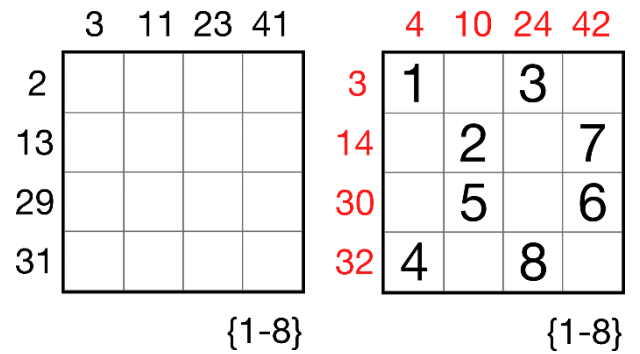
## 17. Doppelblock (30 points)

Put the given numbers into the grid such that each number appears exactly once in each row/column. Shade the remaining cells black; each row/column will have exactly two black cells. A clue outside the grid gives the sum of numbers between the two black cells in its row/column. Two black cells may be adjacent; in this case, the sum of numbers between them is 0.

*Answer key: Enter the contents of the marked rows/columns, using X for black cells.* **Example: 3X21X, 1X3X2**

## 18. Wrong Products (30 points)

Put the given numbers into the grid such that each number appears exactly once in the grid and each row/column contains exactly two numbers. Each clue outside the grid is either one less or one more from the product of the two numbers in the corresponding row/column.
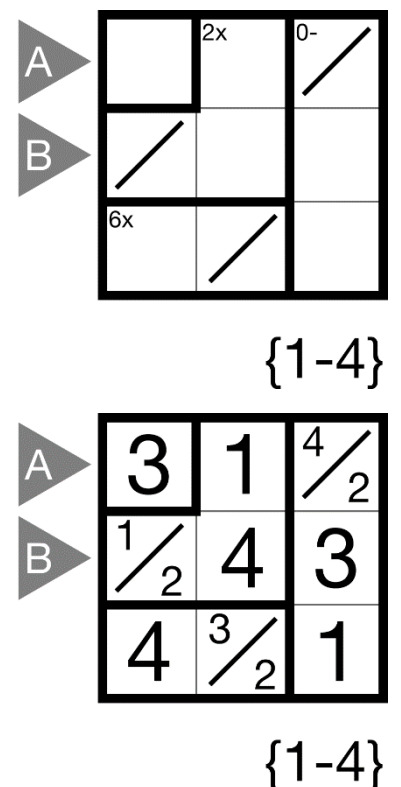
*Answer key: For each row from top to bottom, enter the first number in the row.* **Example: 1254**

## 19. Tom/Tom (40 points)

Put the given numbers into the grid such that each number appears exactly once in each row/column. Slashed cells contain two numbers separated by the slash; all other cells contain one number each. A clue in a region indicates the result of applying the given operation on all numbers in the region, starting from the largest for subtraction and division. Treat slashed cells as fractions for purposes of evaluating the result of an operation.

**Example:** Consider the rightmost region. It contains a 4/2 = 2, a 3, and a 1. Starting from the largest number and using subtraction, we evaluate 3-2-1 = 0, so the clue is 0-.

*Answer key: Enter the contents of the marked rows/columns. For a slashed cell, enter the top number (numerator) first, then the bottom number (denominator).* **Example: 3142, 1243**

# davmillar (David Millar)

## 20. Times Zone (20 points)
## 21. Times Zone (40 points) *(puzzle 21 written by Kagami Ame)*
## 22. Times Zone (70 points)
## 23. Times Zone (100 points)

Put the given numbers into the grid such that each number appears exactly once in each row/column. Then draw a loop along the gridlines. Numbers and symbols outside the grid describe the results of the corresponding row/column as follows:

Break the numbers in the row/column into separate groups according to the loop. Then take the sum/product of each group that is outside/inside the loop, respectively. The clues spell out the resulting sequence of terms in order. A question mark (?) stands for an unknown term. An asterisk (*) stands for any number of unknown terms, including none.

**Example:** Consider the first column of the following example solution. There are three groups of numbers separated by the loop: 2,4,1 outside, then 5,3 inside, then 6 outside.
- As 2,4,1 are outside, take their sum: 7
- As 5,3 are inside, take their product: 15
- As 6 is outside, take its sum: 6 (sum/product of a single number is always itself)

Thus the resulting sequence is "7, 15, 6". Since a ? replaces a term, this is a valid solution to "7, 15, ?". This would also be a valid solution to "7, 15, *" or "7, *", but not "7, ?".

**Note:** The ? and * clues act similar to Cross the Streams.

*Answer key: Enter the contents of cells <u>inside the loop</u> in the marked rows/columns. If there is no cell inside the loop, enter the single digit 0. Only enter the units digits; if you need to enter a 12, use the digit 2.*
***Example:** 6531, 534*



{1,2,3,4,5,6}    {1,2,3,4,5,6}

# Miscellaneous Information

Foursight is wormsofcan's original creation and has never appeared elsewhere before.

Detour is Wen's original creation and has never appeared elsewhere before.

Cross the Streams was invented by Grant Fikes in 2010 as part of the Monday Mutants series (http://mathgrant.blogspot.com/2010/08/monday-mutant-31-cross-streams.html), and has since become a staple genre in logic puzzles.

Heyacrazy is Deusovi's original creation, inspired by the genre Heyawake, and has never appeared elsewhere before.

The origin of Wrong Products is unclear, but Kagami Ame cited the inspiration as WPC 2018, where it appeared in Round 13 – Twisted.

Tom/Tom is a variant of TomTom. Both the original genre and the variant were invented by Thomas Snyder, and the variant in particular appeared in US Puzzle Championship 2013 (https://www.gmpuzzles.com/blog/2013/06/championship-chatter-that-new-tomtom-craze/).

Times Zone is David's original creation, first published on his website (https://thegriddle.net/919).