# PARALLEL UNIVERSE

**11th – 16th September 2020**

**Author: Prasanna Seshadri**

**Important Links**

**Submission Page :** http://logicmastersindia.com/2020/09P/

**Discussion Thread :** http://logicmastersindia.com/t/?tid=2756

**F. A. Q. :** http://logicmastersindia.com/t/?tid=381

**Registration, if required :** http://logicmastersindia.com/register.asp

# About this Contest

(***Author's note*** *– The other Instruction Booklet that is posted with this, as well as the "storyline" below, are for thematic purposes only. There is only one set, having 20 puzzles. There will only be one Puzzle Booklet, and it will be consistent with this Instruction Booklet and not the other one.)*

Hello dear participants! If you are not familiar with this series, please check
Parallel Universe (https://logicmastersindia.com/lmitests/?test=M201404S),
Parallel Universe II (https://logicmastersindia.com/lmitests/?test=M201404P2) and
Parallel Universe III (https://logicmastersindia.com/2020/08P/).

In this next chapter, I am exploring a universe where everything is doubled up on itself. The people of this world invented puzzle types that had the basic premise/concept of the puzzle used again in some way, compared to those same puzzle types on this universe.

Some of you will realize that I actually communicated with this universe briefly to get a small round for WPC 2017 that we titled **Puzzle Fusion**. Some of the puzzle types from there are repeated here, along with some new ones too.

A very funny late addition to the set was Ovotovata and amazingly, the other universe's Eric Fox came up with their idea at the same time as the one on this universe did about a week ago. It really is fascinating how these parallel universes work. Thank you to Eric for the idea.

Anyway, you all know how this works now ☺ This set will contain 10 pairs of puzzles, and within the pair, one will be the puzzle type as on our universe and the other will be the puzzle type as on this other universe. We (both Prasannas) hope you enjoy this chapter and have enjoyed my exploration into other universes so far.

## How to participate?

- Understand the rules of different Puzzles that will appear in this test. This Instruction Booklet has rules and examples for each Puzzle. **The solutions of the examples along with the answer key codes for them are given at the end of the booklet.**
- Download the password protected Puzzle booklet (will be uploaded before the test starts). The Puzzle booklet contains the actual Puzzles to be solved. It is password protected, so you won't be able to open it.
- Any time on or after 11th September (but on or before 16th September), login at the submission page using your LMI user-id and password.
- Please check the submission page for exact timing.
- Click on "Start". At this time, password for pdf will be shown and timer will start.
- You can either solve online using the Penpa interface (details below) or print the pdf and solve on paper.
- Some Puzzles will be marked with arrows
- After solving a Puzzle
    - Fill the answer form as per the answer key format given in the Instruction booklet, along the marked arrow(s)
    - Click submit button

If you are participating at LMI for first time, you must check the F.A.Q. at:
http://logicmastersindia.com/t/?tid=381.

## Points Table and Scoring

Points typically indicate difficulty of the Puzzles and time required to solve them. While the organizers have made best efforts to match them, your personal experience and preference may differ.

This test uses instant grading where a solver can submit any individual Puzzle and receive confirmation that the solution is correct or not. Each incorrect submission reduces the Puzzle's potential score. The first, second, third, and fourth incorrect submissions reduce the potential score to 90%, 70%, 40%, and 0% respectively.

| Puzzle | Points |
|---|---|
| 01 Araf | 25 |
| 02 Araf Araf | 50 |
| 03 Spiral Galaxies | 15 |
| 04 Spiral Galaxies Galaxy | 50 |
| 05 Star Battle | 20 |
| 06 Star Battle Battles | 80 |
| 07 Stostone | 125 |
| 08 Stostone Stostone | 35 |
| 09 Double Back | 60 |
| 10 Double Double Back | 55 |
| 11 LITS | 25 |
| 12 LITS LITS | 40 |
| 13 Skyscrapers | 65 |
| 14 Skyscraper Skyscrapers | 90 |
| 15 Kakuro | 50 |
| 16 Kakuro Kakuro | 80 |
| 17 Ovotovata | 30 |
| 18 Ovotovatatavotovo | 40 |
| 19 Crazy Pavement | 30 |
| 20 Crazy Crazy Pavement | 35 |
| TOTAL | 1000 |

## Contest Duration & Bonus

The contest duration is 120 minutes. Participants will be awarded a bonus of 10 points per minute saved, computed up to seconds, for submitting all puzzles correctly within 120 minutes.

## Penpa Usage

This contest will also be solvable on the Penpa-Edit software. Below the rules of each puzzle will be a link to click to solve on the editor. The editor DOES NOT have a solution enabled so it will not check a solution. Participants must submit the answer key codes as they would with paper solving. It is therefore advisable to enter solution codes one at a time to avoid system lag with too many tabs open.

To practice on the editor, we have given links for solving some of the example puzzles too.

**Author's Note** – I am doing this again after some people in Parallel Universe 3 found it useful. If you want to vote on the usefulness of it or what you solve on too, please visit https://logicmastersindia.com/forum/forums/thread-view.asp?tid=2753#M28471 and leave your vote there.

## Credits

(*On behalf of the other Earth's Prasanna too*) I sincerely thank the following people for their contributions to this contest:
- **Murat Can Tonta, Philipp Weiß,** and **Rakesh Rai** for test solving the puzzles and providing invaluable feedback.
- The original creator **opt-pan** for **penpa edit** - https://opt-pan.github.io/penpa-edit/
- **Swaroop Guggilam** for his recent efforts in adding features to Penpa-edit - https://swaroopg92.github.io/penpa-edit/
- Logic Masters India team for hosting the competition.

## About the Puzzle Booklet

The password protected Puzzle booklet will have approximately 11 pages. The last page is just Penpa Links. If you are planning to solve on paper, we advise you to have a printer accessible with enough paper.

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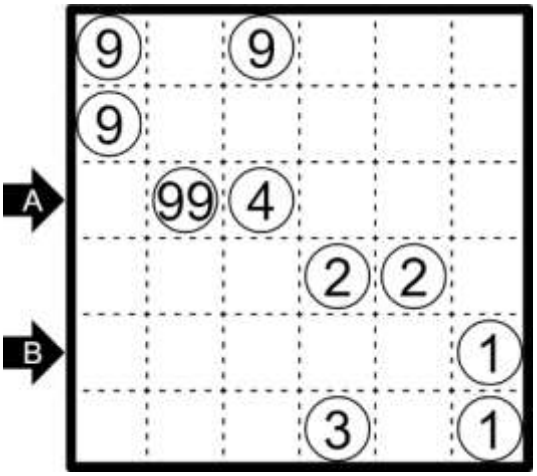
# 01 Araf

## 25 points

Divide the grid into some regions containing two circles each. Each cell of the grid is part of one region. Each region must have an area that is strictly between the numbers in the circles contained in it.

**Penpa link:** https://git.io/JUnQ0

**Answer Key:** For the marked rows/columns, enter the number of consecutive cells in each region from left to right/top to bottom. Enter only the unit's digit for double digit numbers.




# 02 Araf Araf

## 50 points

Follow regular Araf rules as above. Additionally, each region must pair up with another region **that shares an edge with it,** such that their combined area is strictly between the lowest and the highest numbers within them. Numbers can repeat in paired regions.
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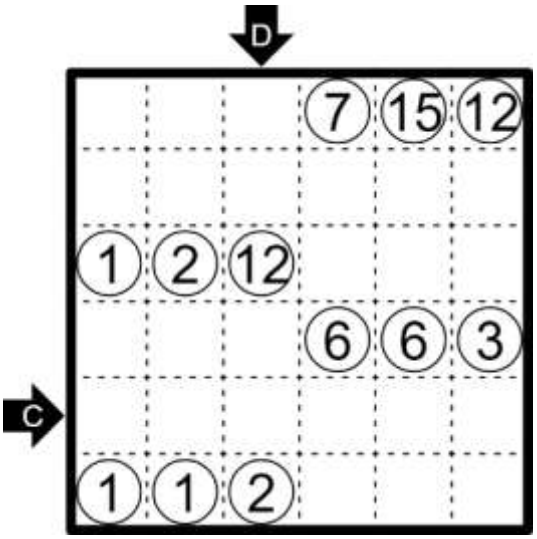
**Penpa link:** https://git.io/JUnQy

**Answer Key:** For the marked rows/columns, enter the number of consecutive cells in each region from left to right/top to bottom. Enter only the unit's digit for double digit numbers**.**



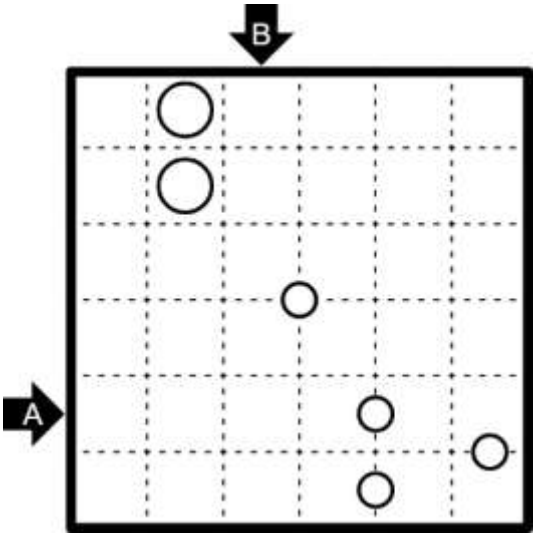

# 03 Spiral Galaxies

## 15 points

Divide the grid into 180 degree symmetrical regions along the gridlines, so that each cell is part of exactly one region. Each region must contain exactly one white circle, which represents the central symmetry point of the region. All circles are given.

**Penpa link:** https://git.io/JUnAl

**Answer Key:** For the marked rows/columns, enter the number of consecutive cells in each region from left to right/top to bottom Enter only the unit's digit for double digit numbers**.**



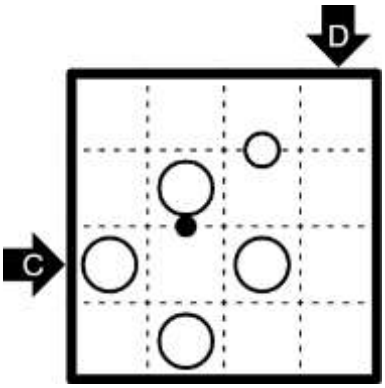
# 04 Spiral Galaxies Galaxy

## 50 points

Follow regular Spiral Galaxies rules as above. However, some cells may not be part of any region. All the used cells must together form a single connected area that is $180^0$ symmetrical with the black circle as the central point of symmetry for this area.

**Penpa link:** https://git.io/JUnxG

**Answer Key:** For the marked rows/columns, enter the number of consecutive cells in each region (**a continuous group of unused cells is counted as a region here**) from left to right/top to bottom Enter only the unit's digit for double digit numbers**.**



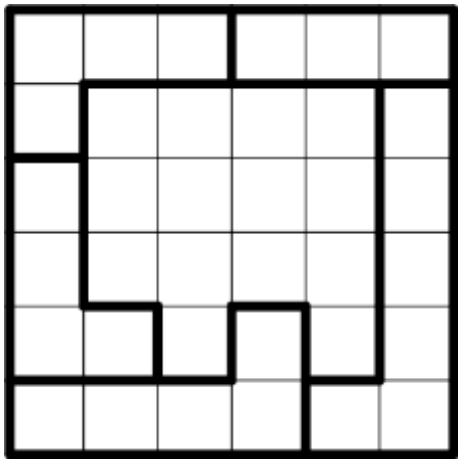

# 05 Star Battle

## 20 points

Place two stars (1 in the example) in each row, column and boldly outlined region. Cells with stars cannot touch each other orthogonally or diagonally.

**Penpa link:** https://git.io/JUnpr

**Answer Key:** For each row from top to bottom, enter the column number of the leftmost star. **Enter Unit's digit for two digit column numbers.**



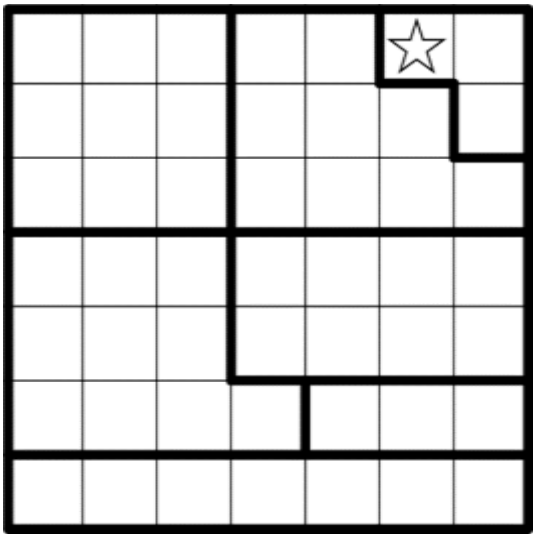
# 06 Star Battle Battles

## 80 points

In this puzzle, there are coloured stars. Place two white stars (1 in the example) as per regular Star Battle rules above. Additionally, place one black star in each row, column and boldly outlined region. Stars of the same colour cannot touch each other orthogonally or diagonally. Stars of different colour may touch diagonally but not orthogonally. Some stars may be given.

**Penpa link:** https://git.io/JUnxg

**Answer Key:** For each row from top to bottom, enter the column number of the black star. **Enter Unit's digit for two digit column numbers.**



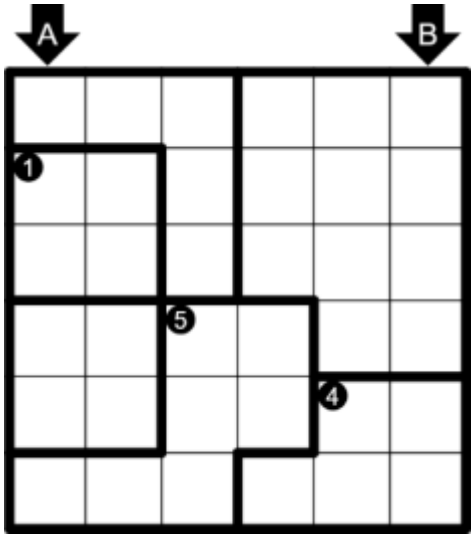
# 07 Stostone

## 125 points

Shade some cells. A contiguous block of shaded cells is a stone. Each stone is contained in exactly one region. Each region contains exactly one stone. Each number indicates the area of the stone in the region. Regions without numbers must have a stone covering an area of 1 or more cells. No two stones share a side. If the stones are dropped by gravity, they fill exactly the bottom half of the grid.

**Penpa link:** https://git.io/JUnh1

**Answer Key:** For the marked rows/columns enter the lengths of contiguous shaded/unshaded cells.



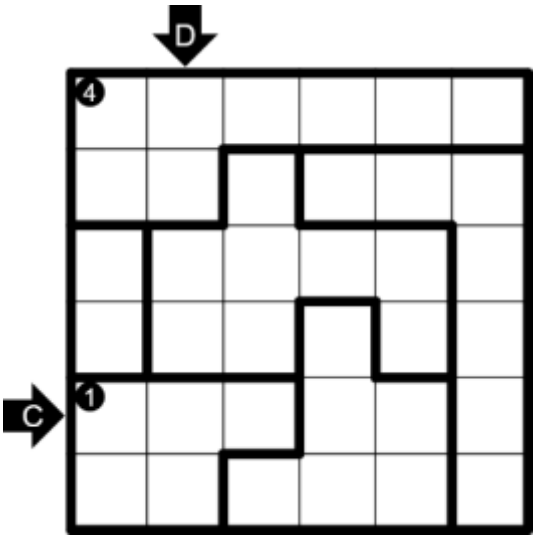

# 08 Stostone Stostone

## 35 points

Follow regular Stostone rules as above. Additionally, separately, gravity also exists to the right, and even if the stones are all shifted to the right they fill exactly the right half of the grid.

**Penpa link:** https://git.io/JUnhZ

**Answer Key:** For the marked rows/columns enter the lengths of contiguous shaded/unshaded cells.



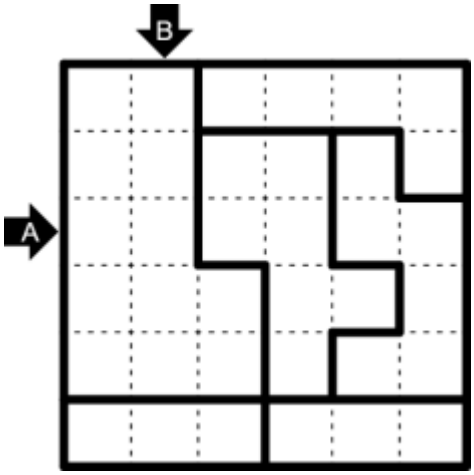

# 09 Double Back

## 60 points

Draw a single closed loop passing horizontally and vertically through the centres of all cells of the grid. The loop may not branch off, or intersect itself. The loop must enter and exit each boldly outlined region exactly twice.

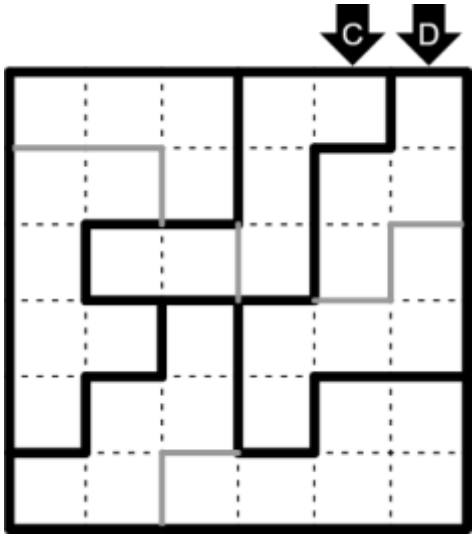
**Penpa link:** https://git.io/JUnjA

**Answer Key:** For the marked rows/columns enter the lengths of loop segments along the direction of the arrow.



# 10 Double Double Back

## 55 points



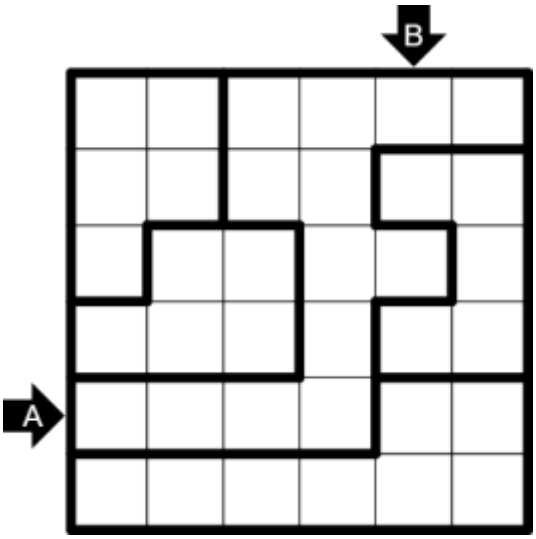

Draw a single closed loop passing horizontally and vertically through the centres of cells. The loop may not branch off, or intersect itself. The loop does not have to visit all cells, but if it visits a region it must visit all cells of that region. The regions are paired by grey lines. The loop must enter and exit each pair of regions twice. This means, within a pair, it will either enter and exit each region exactly once or one of them twice and the other zero times. The grey lines are just to show the pairings and otherwise have no difference to other bold outlines.

**Penpa link:** https://git.io/JUceU

**Answer Key:** For the marked rows/columns enter the lengths of loop segments along the direction of the arrow.

# 11 LITS

## 25 points



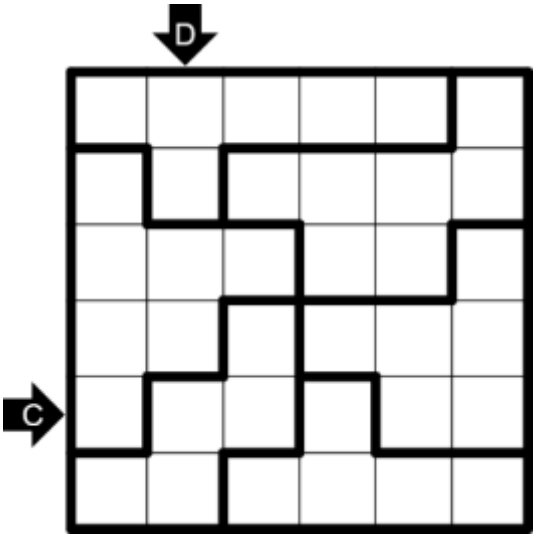

Shade exactly four connected cells in each outlined region, to form an L, I, T, or S tetromino, so that the following conditions are true: (1) All shaded cells are connected with each other; (2) No 2×2 group of cells can be entirely shaded black; (3) When two tetrominoes in adjacent regions share an edge, they must not be of the same type regardless of rotations or reflections.

**Penpa link:** https://git.io/JUcJL

**Answer Key:** For the marked rows/columns enter the lengths of contiguous shaded/unshaded cells.

# 12 LITS LITS

## 40 points




Follow regular LITS rules as above. Additionally, the shaded cells must also be entirely divisible into tetrominoes that never exist completely in the same boldly outlined region. In this division, like the regular LITS wall, when two tetrominoes share an edge, they must not be of the same type regardless of rotations and reflections.

**Penpa link:** https://git.io/JUcJ6

**Answer Key:** For the marked rows/columns enter the lengths of contiguous shaded/unshaded cells.

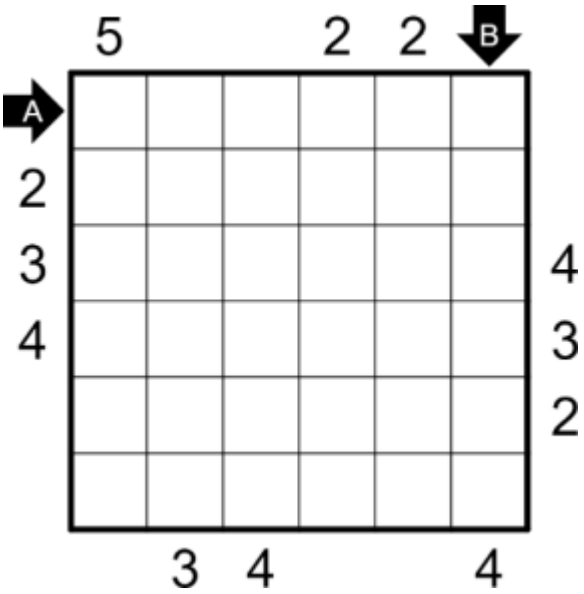
# 13 Skyscrapers

## 65 points

Fill in the grid with digits 1–N where N is the size of the grid. Each row and column contains each digit exactly once. Each number inside the grid represents the height of a building. The clues outside of the grid indicate how many buildings can be seen when looking from that direction. Taller buildings block the view of smaller buildings.

**Penpa link:** https://git.io/JUcUZ

**Answer Key:** For each marked row (or column), enter the contents of the row (or column) from left to right (or top to bottom).



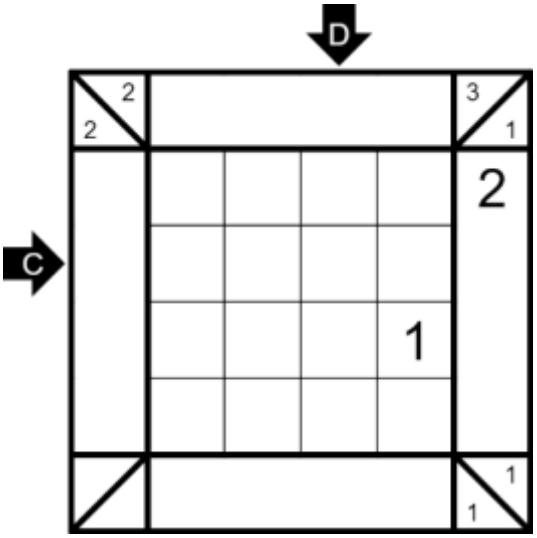

# 14 Skyscraper Skyscrapers

## 90 points

Apply regular Skyscraper rules as above. Additionally, the numbers beside diagonal lines indicate the number of skyscrapers seen considering skyscraper clues in a line in the corresponding direction. These outer lines may contain repeating digits, and digits hide smaller as well as same sized digits behind them.

**Penpa link:** https://git.io/JUcUu

**Answer Key:** For each marked row (or column), enter the contents of the row (or column) from left to right (or top to bottom), **including the outer digits**.



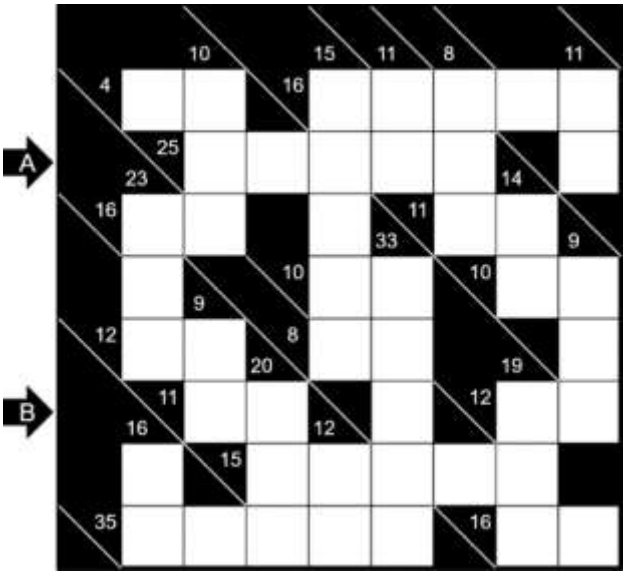

# 15 Kakuro

## 50 points

Enter a single digit from 1 to 9 into each white cell so that the sum of digits in each Across entry equals the value given to the left of the entry, and the sum of digits in each Down entry equals the value given above the entry. No digit may be repeated within a single entry (i.e., group of cells connected horizontally or vertically without any black cells between).

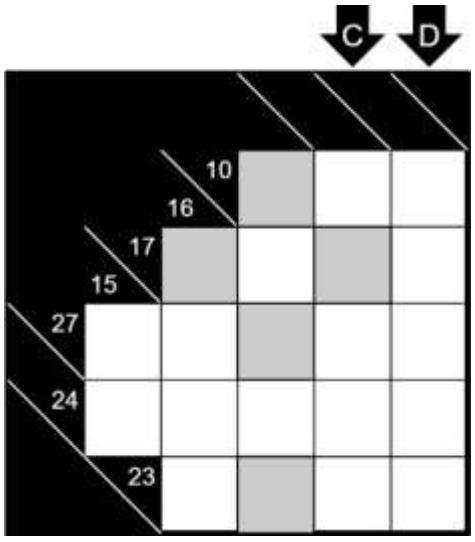
**Penpa link:** https://git.io/JUcT6

**Answer Key:** For each marked row (or column), enter the contents of the row (or column) from left to right (or top to bottom), ignoring black cells.



# 16 Kakuro Kakuro

## 80 points



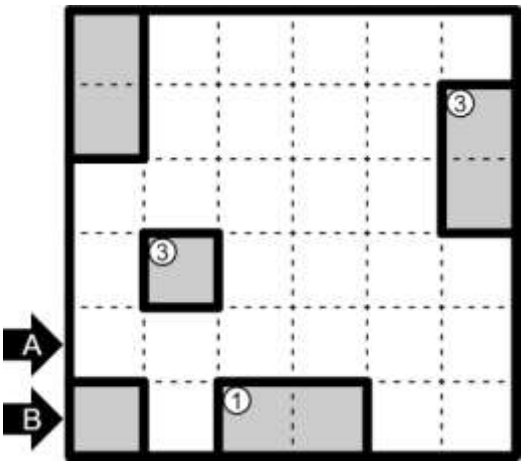

Follow regular Kakuro rules as above. Additionally, some cells are shaded and the digits in these shaded cells double up as Kakuro clues for subsequent white cells, till the next grey cell, black cell or grid boundary. It is up to the solver to determine if the shaded cell digit is an across or a down clue and it could be both. Black cell sums consider shaded cells as white cells.

**Penpa link:** https://git.io/JUcT7

**Answer Key:** For each marked row (or column), enter the contents of the row (or column) from left to right (or top to bottom), ignoring black cells.

# 17 Ovotovata

## 30 points



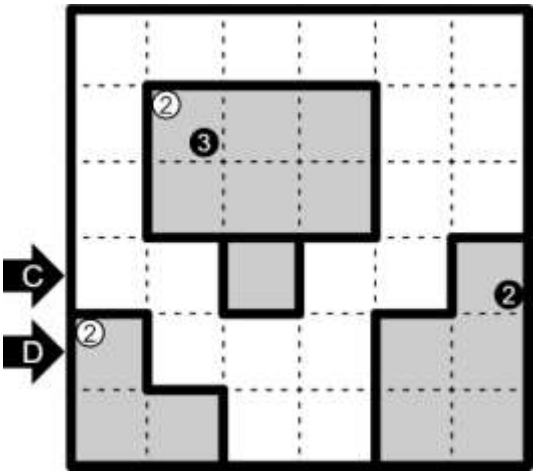

Draw a single closed loop passing horizontally and vertically through the centers of cells that passes through every shaded region **at least once**. The loop may not branch off, or intersect itself. Whenever the loop exits a region with a white circle (in any direction) it must go straight till the Nth cell in that direction and then turn, where n is the number in the circle.

**Penpa link:** https://git.io/JUcks

**Answer Key:** For the marked rows/columns enter the lengths of loop segments along the direction of the arrow.

# 18 Ovotovatatavotovo

## 40 points




Apply regular Ovotovata rules as above. Additionally, whenever the loop enters a region with a black circle (in any direction) it must go straight till the Nth cell in that direction and then turn, where n is the number in the circle.

**Penpa link:** https://git.io/JUck8

**Answer Key:** For the marked rows/columns enter the lengths of loop segments along the direction of the arrow.

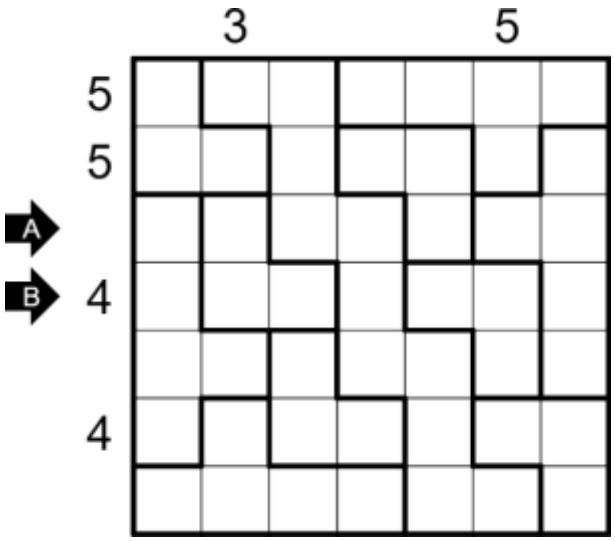
# 19 Crazy Pavement

## 30 points

Shade some cells in the grid so that for each boldly outlined region either all its cells are shaded or none at all. Numbers outside the grid indicate the number of shaded cells in that row/column.

**Penpa link:** https://git.io/JUckz

**Answer Key:** For the marked rows/columns enter the lengths of contiguous shaded/unshaded cells.




# 20 Crazy Crazy Pavement

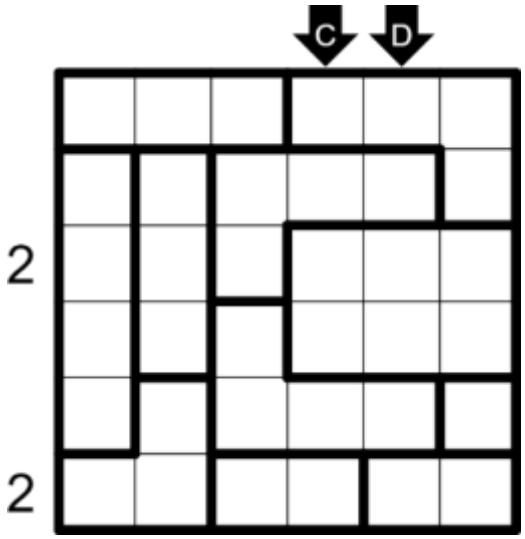
## 35 points

Shade some cells in the grid so that for each boldly outlined region either all its cells are shaded or none at all. Shaded cells must form a contiguous group and cannot fully cover a 2x2 area of cells.

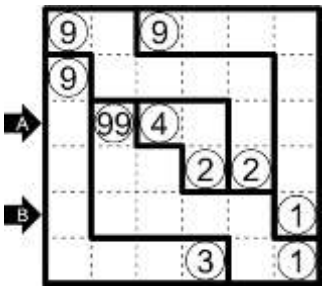
Numbers outside the grid either all indicate the number of shaded cells in that row/column, or they all indicate the number of unshaded cells in that row/column. It is up to the solver to determine which. Once determined it is true for all numbers.

**Penpa link:** https://git.io/JUckH

**Answer Key:** For the marked rows/columns enter the lengths of contiguous shaded/unshaded cells.

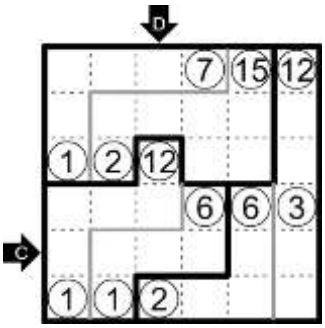


### 01 Araf



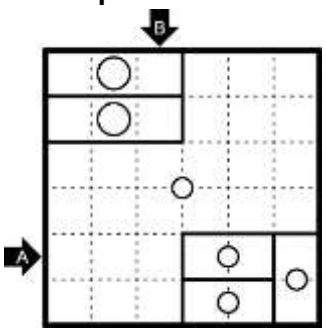
Answer Key: 11211,141

### 02 Araf Araf



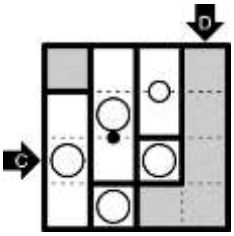
Answer Key: 1311,11211

### 03 Spiral Galaxies



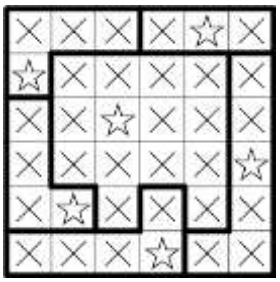
Answer Key: 321,114

### 04 Spiral Galaxies Galaxy



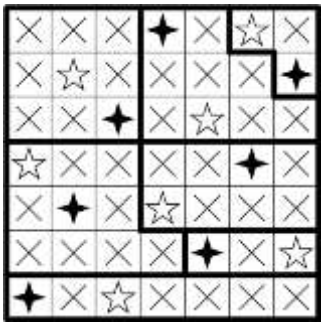
Answer Key: 1111,4

### 05 Star Battle



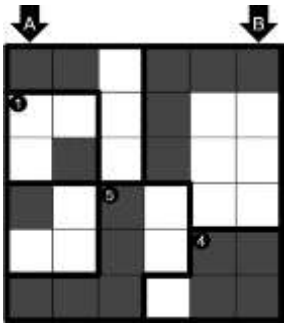
Answer Key: 513624

### 06 Star Battle Battles



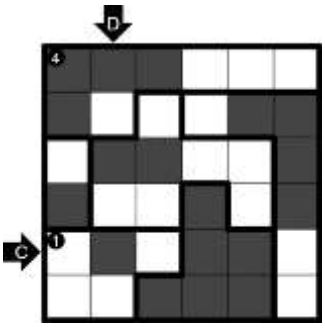
Answer Key: 4736251

### 07 Stostone



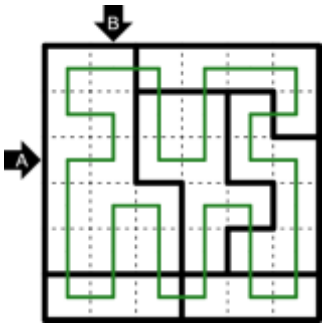
Answer Key: 12111,132

### 08 Stostone Stostone



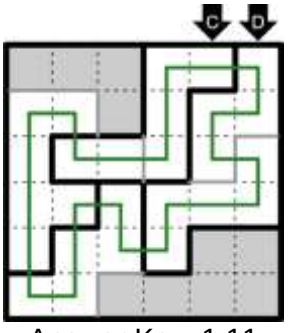
Answer Key: 11121,111111

### 09 Double Back



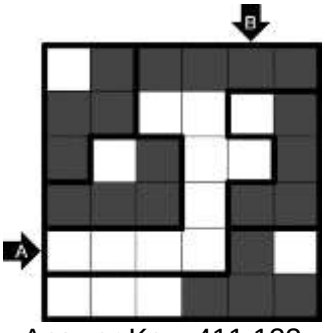
Answer Key: 111,12

### 10 Double Double Back



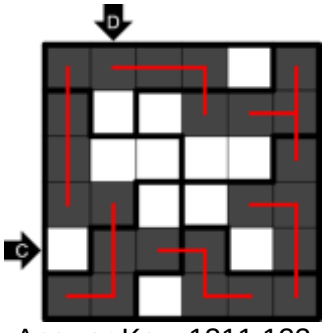
Answer Key: 1,11

### 11 LITS



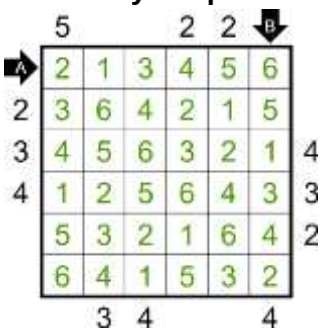
Answer Key: 411,123

### 12 LITS LITS



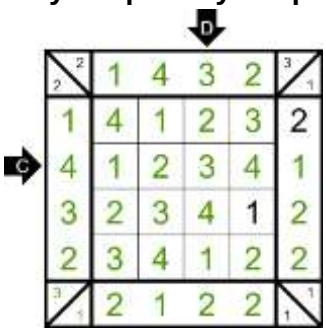
Answer Key: 1311,123

### 13 Skyscrapers



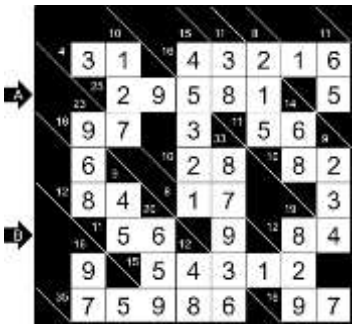

Answer Key: 213456,651342

### 14 Skyscraper Skyscrapers



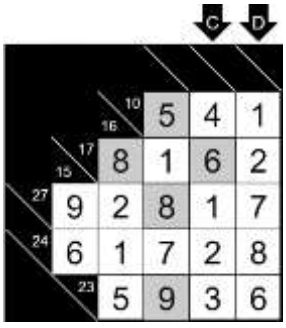

Answer Key: 412341,323412

### 15 Kakuro



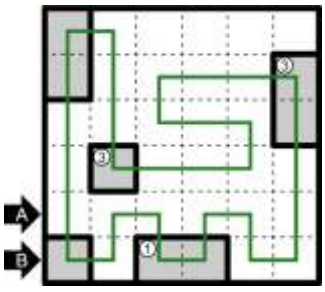

Answer Key: 295815,56984

### 16 Kakuro Kakuro



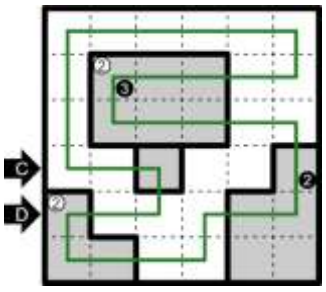

Answer Key: 46123,12786

### 17 Ovotovata



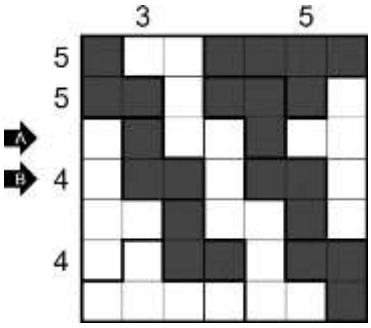

Answer Key: 11,111

### 18 Ovotovatatavotovo



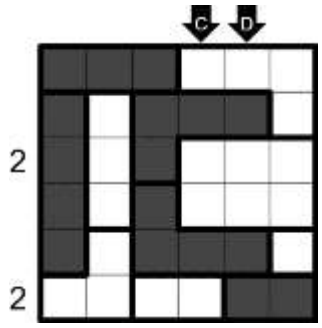

Answer Key: 2,22

### 19 Crazy Pavement




Answer Key: 11212,12121

### 20 Crazy Crazy Pavement




Answer Key: 11211,1122

Happy Solving! ☺