sudoku mahabharat

Instructions Booklet

Episode – 5
14th – 19th May 2021

Converse Variations
By
Hemant Kumar Malani

Important Links

Submission Page : http://logicmastersindia.com/live/?contest=SM202105

Discussion Thread : http://logicmastersindia.com/t/?tid=2832

F. A. Q. : http://logicmastersindia.com/t/?tid=2773

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

About this Episode

This episode has 18 sudokus from the following types
- 4 * Mini Classic Sudoku
- 4 * Classic Sudoku
- 2 * Anti Knight Sudoku
- 2 * XV Sudoku
- 2 * Battenburg Sudoku
- 2 * Kropki Sudoku
- 2 * Average Sudoku

Test Duration

The test duration is 90 minutes. Participants get 90 minutes to submit their answers, after they click on "Start" button.

How to participate?

- Understand the rules of different Sudokus that will appear in this episode. This Instruction Booklet has rules and examples for each Sudoku.
- Download the password protected Sudoku booklet (will be uploaded before the test starts). The Sudoku booklet contains the actual Sudokus to be solved. It is password protected, so you won't be able to open it.
- Any time on or after 14th May (but on or before 19th May), login at the submission page using your LMI userid and password. Please check the submission page for exact timings.
- Click on "Start". At this time, password for pdf will be shown and timer will start.
- The Sudoku booklet can be downloaded, printed and solved on paper.
- Each Sudoku will be marked with two lettered arrows (rows and / or columns). These form the answer key for the Sudoku.
- There will NOT be any interface / applet to solve the Sudokus on web browser, but external Penpa links will be provided. The participant is still expected to come back and enter the answer key if solving using the links.
- Most of the Sudokus are designed to be solved faster on paper.
- We advise you to have a printer accessible with enough paper.
- Outside solving help of any kind is not permitted. This includes but is not limited to: assistance of any kind from any other person; prepared notes, books, calculators, computers/solvers, or tools other than items explicitly permitted.
- You are allowed to use writing implements, eraser, blank paper (including commercial graph paper), ruler, scissors, and tape.

If you are participating at LMI for first time, you must check the F.A.Q. at http://logicmastersindia.com/t/?tid=2773 .

About answer keys and Submission

- Each Sudoku has two lettered arrows outside the grid which serve as answer keys.
- After solving the Sudoku, you need to submit the answer keys.
- You may submit the answer keys anytime during the test duration. You may consider submitting a Sudoku as soon as you solve it.
- Answer keys are always to be entered from left to right or top to bottom.
- Don't enter any separator unless specified in the answer key.
- If one row and one column is marked, enter the row first and then the column.

- If multiple rows are marked, enter from top to bottom for marked rows.
- If multiple columns are marked, enter from left to right for marked columns.
- If horizontal and vertical keys are needed, first enter the horizontal and then the vertical key.
- Uppercase or lower case of answer key does not matter.
- Characters other than alphabets, numbers and comma will be removed while checking the answer.

Points Table and Scoring

Points typically indicate difficulty of the Sudokus and time required to solve them. You will get full points if you enter the correct answer key. While the organizers have made best efforts to match them, your personal experience and preference may differ.

Mini Classic 1-6	1, 1, 1, 1
Classic 1-9	5, 5, 7, 8
Anti Knight 1-6,1-9	2, 9
XV 1-6,1-9	2, 9
Battenburg 1-6,1-9	2, 11
Kropki 1-6,1-9	2, 13
Average 1-6,1-9	3, 18

This test uses instant grading where a solver can submit any individual Sudoku and receive confirmation that the solution is correct or not. Each incorrect submission reduces the sudoku's potential score. The first, second, third, and fourth incorrect submissions reduce the potential score to 90%, 70%, 40%, and 0% respectively. A demonstration for this is shown below (The example shows a puzzle but the behaviour will be same for a sudoku):

Original points

04 Araf	50 points	4A	Sum should be 10

Potential points after 1 incorrect submission

04 Araf	45 / 50	4A	1234

Potential points after 2 incorrect submissions

04 Araf	35 / 50	4A	23311

Potential points after 3 incorrect submissions

04 Araf	20 / 50	4A	1111111111

Potential points after 4 incorrect submissions

04 Araf	0 / 50	4A	541

Bonus

If you submitted all Sudokus correctly, you can have bonus points 1 point per minute saved, computed up to seconds.

Ranking will be based on following rules in order:
1. Most total points
2. Earliest final submission time, up to seconds (ignoring incorrect submissions)

Penpa Usage

This contest will also be solvable on the Penpa-Edit software. Below the rules of each Sudoku 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 the example sudokus too.

Credits
- 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/
- **Rajesh Kumar** for the Battenburg Sudoku (9x9) example.

General Rules

To make the rules less repetitive, you will see following line "Apply classic Sudoku rules" in most Sudoku rules. This means "Place a digit from 1 to N, where N is the size of the grid, in each empty cell so that each digit appears exactly once in each row, column and outlined region."
These outlined regions could be 3X3 boxes, or other shapes.

Each Sudoku will be marked with 2 lettered arrows. You need to submit the digits in these arrows, in order, including the givens. For example, the answer key for the Sudoku at the right is 162897453, 517698432.

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

About the Sudoku Booklet

The password protected Sudoku booklet will have 8 pages. If you are planning to solve on paper, we advise you to have a printer accessible with enough paper.

The Sudoku booklet will look similar to the next pages in this instruction booklet. The font sizes, cell sizes, colors, borders, shading, margin will be similar. We recommend you to print few pages of this instruction booklet. You can avoid any last minute surprise during the test.

Solutions and keys to examples are at the end of the booklet.

1-4 Mini Classic Sudoku (1+1+1+1 points)

Penpa Link: https://git.io/JtcnY

Mini Classic Sudoku

Place a digit from 1 to 6 in each empty cell so that each digit appears exactly once in each row, column and 2X3 box.

1	2				
		3	4		
				5	6
3	5				
		1	5		
				1	3

5-8 Classic Sudoku (5+5+7+8 points)

Penpa Link: https://git.io/Jtc6m

Classic Sudoku

Place a digit from 1 to 9 in each empty cell so that each digit appears exactly once in each row, column and 3X3 box.

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

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Converse

Anti Knight Sudoku - 1

2 points

Apply classic Sudoku rules.

No cell that is a knight-step away can contain the same digit. In chess, a knight moves two squares forward followed by one sideways.

For example, If a digit is present in the centre cell marked with a dot, the same digit cannot appear in the cells marked with X.

1	2			3	4
5	6			4	1

A ▶
B ▶

Anti Knight Sudoku - 2

9 points

Apply classic Sudoku rules.

No cell that is a knight-step away can contain the same digit. In chess, a knight moves two squares forward followed by one sideways.

For example, If a digit is present in the centre cell marked with a dot, the same digit cannot appear in the cells marked with X.

C ▼   D ▼

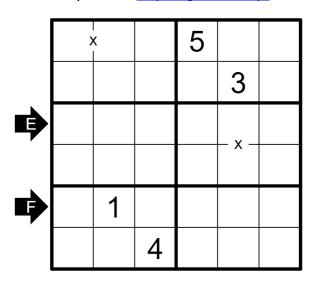| 9				4		6		7
	8			3			4	
6								
			8		5			
1	5						7	8
			9		4			
								4
	9			6			1	
2		8		9				5

Converse

XV Sudoku - 1

2 points

Apply classic Sudoku rules.

If the sum of digits in orthogonally adjacent cells is 10, then they are separated by X. If the sum of digits in orthogonally adjacent cells is 5, then they are separated by V.

All possible X and V are marked.

XV Sudoku - 2

9 points

Apply classic Sudoku rules.

If the sum of digits in orthogonally adjacent cells is 10, then they are separated by X. If the sum of digits in orthogonally adjacent cells is 5, then they are separated by V.

All possible X and V are marked.

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Converse

Battenburg Sudoku - 1

2 points
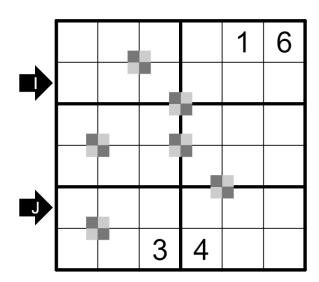
Apply classic Sudoku rules.

Wherever 2 odd and 2 even digits form a 2x2 checkerboard pattern, a Battenburg marking (▤) is given. If there is no marking, the above pattern is not allowed.

Following are the possible 2x2 checkerboard patterns (O denotes odd digit, and E denotes even digit):

O	E
E	O

E	O
O	E

Battenburg Sudoku - 2

11 points

Apply classic Sudoku rules.

Wherever 2 odd and 2 even digits form a 2x2 checkerboard pattern, a Battenburg marking (▤) is given. If there is no marking, the above pattern is not allowed.

Following are the possible 2x2 checkerboard patterns (O denotes odd digit, and E denotes even digit):

O	E
E	O

E	O
O	E

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Converse

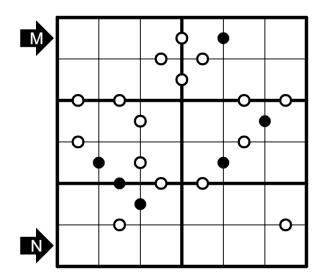## Kropki Sudoku - 1
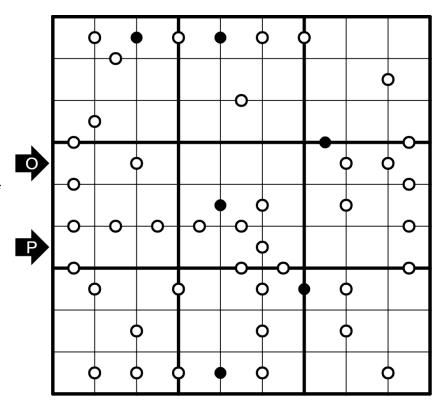
2 points

Apply classic Sudoku rules.

If the difference between digits in orthogonally adjacent cells is 1, then they are separated by a white dot.

If the digit in a cell is half of the digit in an orthogonally adjacent cell, then they are separated by a black dot.

The dot between '1' and '2' can have any of these dots.

All possible dots are marked.

Kropki Sudoku - 2

13 points

Apply classic Sudoku rules.

If the difference between digits in orthogonally adjacent cells is 1, then they are separated by a white dot.

If the digit in a cell is half of the digit in an orthogonally adjacent cell, then they are separated by a black dot.

The dot between '1' and '2' can have any of these dots.

All possible dots are marked.

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Converse

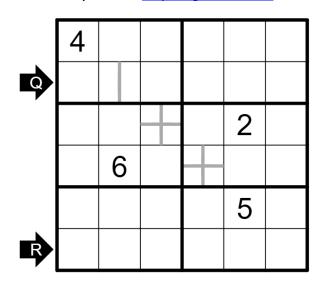## Average Sudoku - 1

3 points

Apply classic Sudoku rules.

If the number in a cell equals the average of its two horizontal neighbours then the cell is marked with a horizontal line.

If the number in a cell equals the average of its two vertical neighbours then the cell is marked with a vertical line.

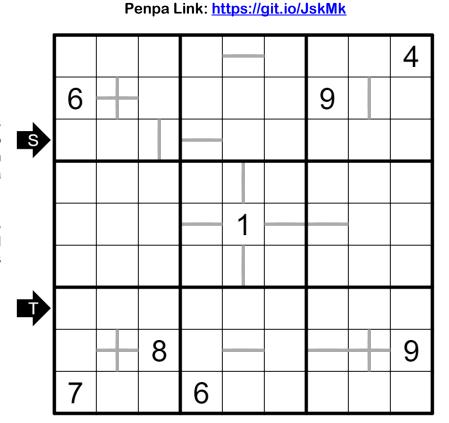All possible lines are marked.

Average Sudoku - 2

18 points

Apply classic Sudoku rules.

If the number in a cell equals the average of its two horizontal neighbours then the cell is marked with a horizontal line.
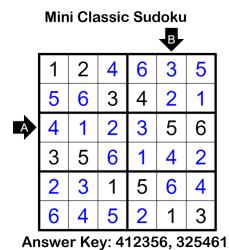
If the number in a cell equals the average of its two vertical neighbours then the cell is marked with a vertical line.

All possible lines are marked.

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Mini Classic Sudoku

			B		
1	2	4	6	3	5
5	6	3	4	2	1
4	1	2	3	5	6
3	5	6	1	4	2
2	3	1	5	6	4
6	4	5	2	1	3

(A → row 3)

Answer Key: 412356, 325461

Classic Sudoku

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

(D → column 4; C → row 5)

Answer Key: 781564329, 718369254

Anti Knight - 1

1	2	6	5	3	4
4	3	5	1	2	6
6	5	3	4	1	2
2	1	4	6	5	3
3	4	1	2	6	5
5	6	2	3	4	1

(A → row 3; B → row 4)

Answer Key: 653412, 214653

XV – 1

4 × 6	3	5	1	2

4	6	3	5	1	2
2	5	1	6	3	4
5	4	2	1	6	3
1	3	6	2	4	5
3	1	5	4	2	6
6	2	4	3	1	5

(E → row 3; F → row 5)

Answer Key: 542163, 315426

Anti Knight – 2

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

Answer Key: 152396748, 625143987

XV – 2

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

(G → row 5)

Answer Key: 479251638, 136859472

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Battenburg – 1

Answer Key: 136524, 524631

Kropki – 1

Answer Key: 513426, 135264

Battenburg – 2

Answer Key: 259184736, 693817452

Kropki – 2

Answer Key:576819234, 382745916

Average – 1

Answer Key: 326415, 251634

Average – 2

Answer Key: 983457612, 291875463

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Converse