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Episode – 3
22nd – 27th April 2022

Converse & Outside
by
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Sudoku Mahabharat rounds will also serve as qualifiers for Indian Sudoku Championship for year 2022. Please check <http://logicmastersindia.com/SM/2022sm.asp> for details.

Important Links

Submission Page : <http://logicmastersindia.com/live?contest=SM202203>

Discussion Thread : <http://logicmastersindia.com/t/?tid=3025>

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 with the following breakdown:

- 2* Classic Sudoku 6x6 and 4* Classic Sudoku 9x9
- 1 each of XV Sudoku 6x6 and XV Sudoku 9x9
- 1 each of Anti Knight Sudoku 6x6 and Anti Knight Sudoku 9x9
- 1 each of No Touch Sudoku 6x6 and No Touch Sudoku 9x9
- 1 each of Outside Sudoku 6x6 and Outside Sudoku 9x9
- 1 each of Skyscrapers Sudoku 6x6 and Skyscrapers Sudoku 9x9
- 1 each of Sum Frame Sudoku 6x6 and Sum Frame Sudoku 9x9

How to participate?

- Understand the rules of different variants that will appear in this episode. This Instruction Booklet has rules for each of them.
- Any time on or after 22nd April (but on or before 27th April), login at the submission page using your LMI user-id and password. Please check the submission page for exact timing.
- **If you plan to solve on paper:**
 - a) 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.
 - b) Click on "Start". At this time, password for pdf will be shown and timer will start. **The contest duration is 90 minutes.**
 - c) The puzzle booklet can be downloaded, printed and solved on paper.
 - d) We advise you to have a printer accessible with enough paper.
 - e) You are allowed to use writing implements, eraser, blank paper (including commercial graph paper), ruler, scissors, and tape.
- **If you plan to solve on LMI's Penpa-Integrated Interface:**
 - a) Click on this link and understand the instructions - <https://logicmastersindia.com/live/faq-online-solving.asp>
 - b) It is noted on the link too, but we note it here as well to be clear – the participants must still input the answer keys in the boxes below the puzzle and submit them to receive credit as given below.
- 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, or tools other than items explicitly permitted.
- Participants may use both paper solving and online solving, even interchangeably. Eventually our system will only count anything submitted in the submission boxes in either mode.

If you are participating at LMI for first time, it will be useful to check the F.A.Q. at <http://logicmastersindia.com/t/?tid=2773>.

About answer keys and Submission

- After solving the puzzle, you need to submit the puzzle using the answer keys.
 - You may submit the answer keys anytime during the test duration.
 - 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
-

Points Table and Scoring

Points typically indicate difficulty of the Puzzles 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.**

Classic Sudoku 6x6	1, 1
Classic Sudoku 9x9	4, 3, 5, 5
XV Sudoku 6x6 & 9x9	2, 13
Anti Knight Sudoku 6x6 & 9x9	1, 10
No Touch Sudoku 6x6 & 9x9	3, 5
Outside Sudoku 6x6 & 9x9	2, 5
Skyscrapers Sudoku 6x6 & 9x9	6, 16
Sum Frame Sudoku 6x6 & 9x9	2, 16

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. A demonstration for this is shown below.

Original points

04 Araf	50 points	4A	Sum should be 10
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Potential points after 1 incorrect submission

04 Araf	45 / 50	4A	1234
---------	---------	----	------

Potential points after 2 incorrect submissions

04 Araf	35 / 50	4A	23311
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Potential points after 3 incorrect submissions

04 Araf	20 / 50	4A	111111111
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Potential points after 4 incorrect submissions

04 Araf	0 / 50	4A	541
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Bonus and Ranking

If you submitted all Puzzles 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)

Credits

- **Jacob Cohen (A.K.A. Conflux), Niverio & Yosh (rand_yosh314)** 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/> and also working to integrate it with our contest engine.

About the Puzzle Booklet

The password protected Puzzle booklet will have 9-10 pages. This is relevant only for paper solvers.

Solutions to examples are towards the end of the booklet in the Solutions section.

Rules Powered by Sudokuib - <https://github.com/vopani/sudokuib>

All answer keys are the same for all puzzles – enter the contents of the marked rows/columns, including given digits, along the direction of the arrow. Do not enter Outside Clues.

1-2 Classic Sudoku 6x6

Place a digit from 1 to 6 into each empty cell in the grid so that each digit appears exactly once in each row, column and 2x3 outlined box.

Penpa for example:

<https://tinyurl.com/2nvezsrr>

1 + 1 points

↓ B

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

← A

3-6 Classic Sudoku 9x9

Place a digit from 1 to 9 into each empty cell in the grid so that each digit appears exactly once in each row, column and 3x3 outlined box.

Penpa for example:

<https://tinyurl.com/333ntt48>

4 + 3 + 5 + 5 points

↓ B

	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	

← A

7 XV Sudoku 6x6

2 points

Place a digit from 1 to 6 into each empty cell in the grid so that each digit appears exactly once in each row, column and 2x3 outlined box.

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.

Penpa for example:

<https://tinyurl.com/y32jyfdp>

	x		5		
				3	
				x	
	1				
		4			

8 XV Sudoku 9x9

13 points

Place a digit from 1 to 9 into each empty cell in the grid so that each digit appears exactly once in each row, column and 3x3 outlined box.

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.

Penpa for example:

<https://tinyurl.com/y2pjtteo>

			x	v				
	9		8	5		2		
		8		2		4		
	1		6		2			
		2		3		5		
	8		5		3			
	4		1	6		8		
			v	x				

9 Anti Knight Sudoku 6x6

1 points

Place a digit from 1 to 6 into each empty cell in the grid so that each digit appears exactly once in each row, column and 2x3 outlined box.

No cell that is a knight-step away can contain the same digit. A knight's move is 2 in a line and 1 to the side, as in chess.

Penpa for example:

<https://tinyurl.com/y2uy3ajd>

1	2			3	4
5	6			4	1

10 Anti Knight Sudoku 9x9

10 points

Place a digit from 1 to 9 into each empty cell in the grid so that each digit appears exactly once in each row, column and 3x3 outlined box.

No cell that is a knight-step away can contain the same digit. A knight's move is 2 in a line and 1 to the side, as in chess.

Penpa for example:

<https://tinyurl.com/yxhdxclf>

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

11 No Touch Sudoku 6x6

3 points

Place a digit from 1 to 6 into each empty cell in the grid so that each digit appears exactly once in each row, column and 2x3 outlined box.

Diagonally touching cells must not contain the same digit.

Penpa for example:

<https://tinyurl.com/yy5rch5b>

	1			4	
		2	3		
	3	1	6	5	

12 No Touch Sudoku 9x9

5 points

Place a digit from 1 to 9 into each empty cell in the grid so that each digit appears exactly once in each row, column and 3x3 outlined box.

Diagonally touching cells must not contain the same digit.

Penpa for example:

<https://tinyurl.com/y352qvm1>

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

13 Outside Sudoku 6x6

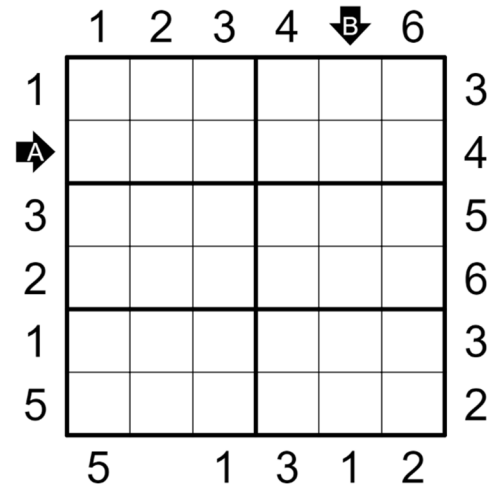
2 points

Place a digit from 1 to 6 into each empty cell in the grid so that each digit appears exactly once in each row, column and 2x3 outlined box.

Each number outside the grid must appear within the first box in the corresponding direction.

Penpa for example:

<https://tinyurl.com/yy5o9d2o>



14 Outside Sudoku 9x9

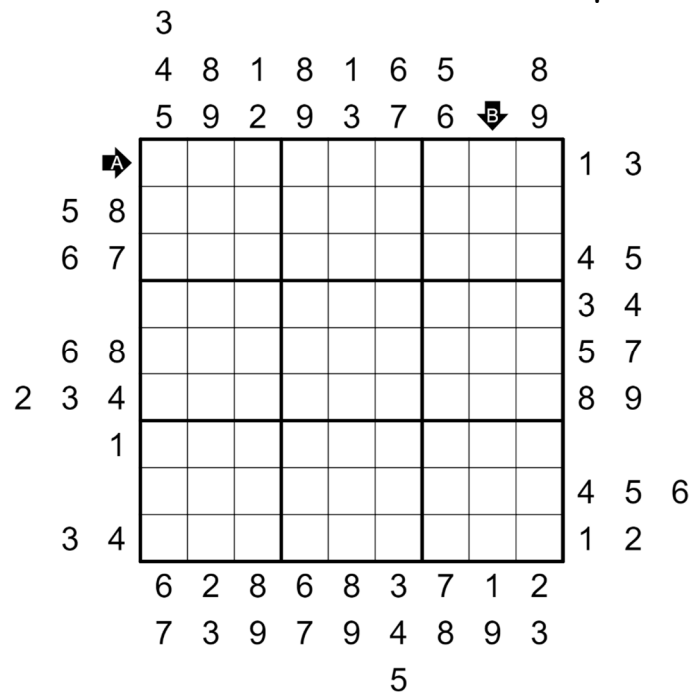
5 points

Place a digit from 1 to 9 into each empty cell in the grid so that each digit appears exactly once in each row, column and 3x3 outlined box.

Each number outside the grid must appear within the first box in the corresponding direction.

Penpa for example:

<https://tinyurl.com/yytyhde3>



15 Skyscrapers Sudoku 6x6

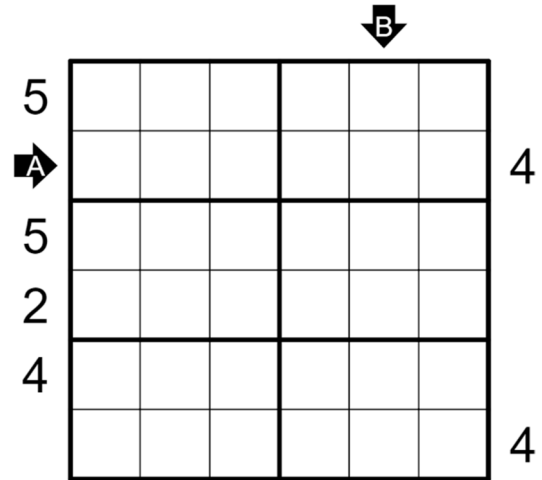
6 points

Place a digit from 1 to 6 into each empty cell in the grid so that each digit appears exactly once in each row, column and 2x3 outlined box.

Each digit inside the grid represents the height of a skyscraper in that cell. Each number outside the grid represents the number of skyscrapers that can be seen in the corresponding row or column. Taller skyscrapers hide shorter ones.

Penpa for example:

<https://tinyurl.com/y4ljb5tl>



16 Skyscrapers Sudoku 9x9

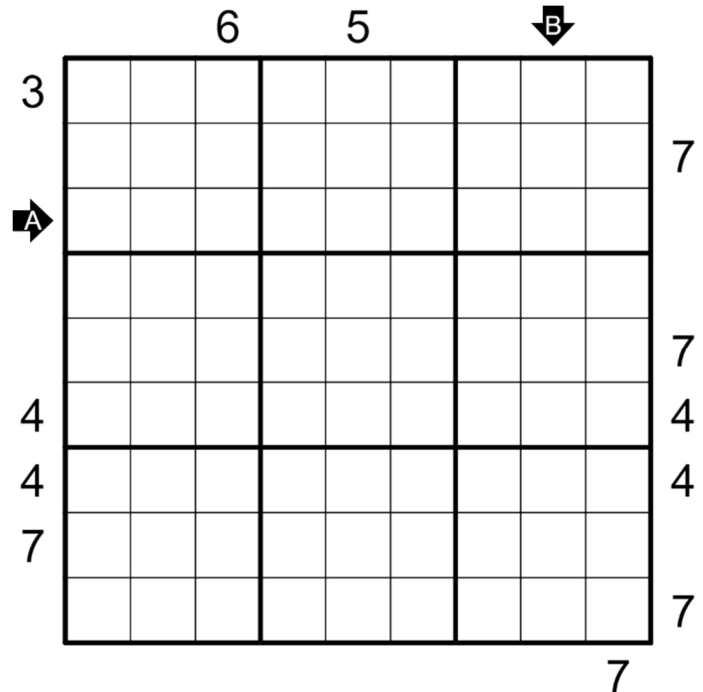
16 points

Place a digit from 1 to 9 into each empty cell in the grid so that each digit appears exactly once in each row, column and 3x3 outlined box.

Each digit inside the grid represents the height of a skyscraper in that cell. Each number outside the grid represents the number of skyscrapers that can be seen in the corresponding row or column. Taller skyscrapers hide shorter ones.

Penpa for example:

<https://tinyurl.com/yxfcy972>



17 Sum Frame Sudoku 6x6

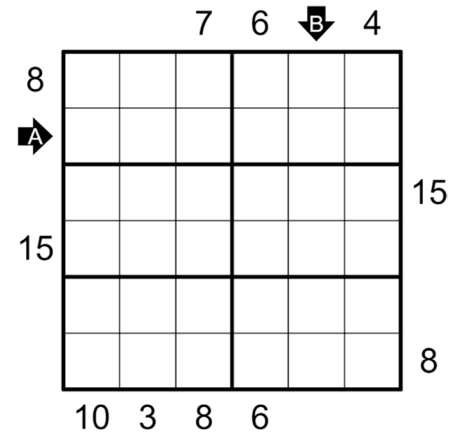
2 points

Place a digit from 1 to 6 into each empty cell in the grid so that each digit appears exactly once in each row, column and 2x3 outlined box.

Each number outside the grid is the sum of the digits within the first box in the corresponding direction.

Penpa for example:

<https://tinyurl.com/y3q6lz6u>



18 Sum Frame Sudoku 9x9

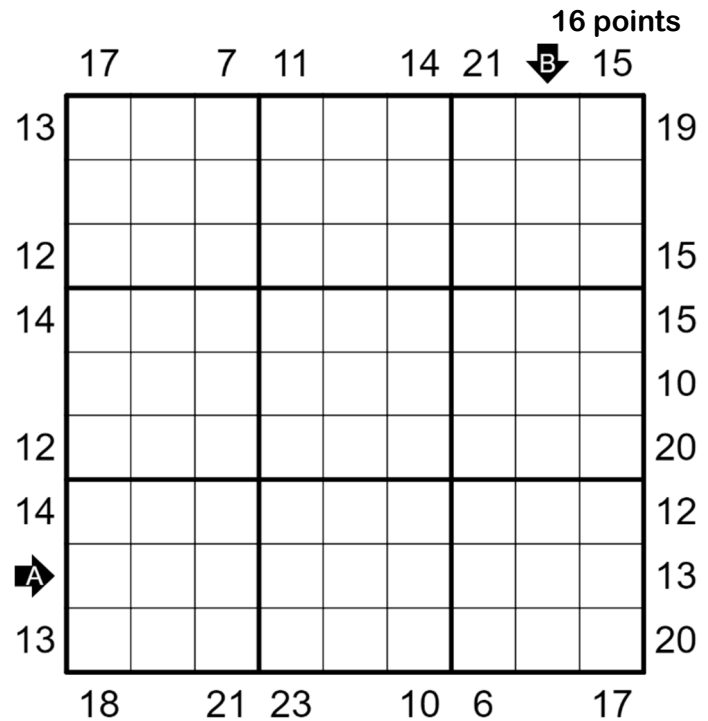
16 points

Place a digit from 1 to 9 into each empty cell in the grid so that each digit appears exactly once in each row, column and 3x3 outlined box.

Each number outside the grid is the sum of the digits within the first box in the corresponding direction.

Penpa for example:

<https://tinyurl.com/y2bys3lc>



Solutions

Classic Sudoku 6x6

↓ 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

Key: 412356,325461

XV Sudoku 6x6

↓ B

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	5	1

→ A

Key: 542163,561243

Anti Knight Sudoku 6x6

↓ B

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

Key: 341265,146235

Classic Sudoku 9x9

↓ B

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

→ A

Key: 781564329,718369254

XV Sudoku 9x9

↓ B

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

→ A

Key: 315687294,879261354

Anti Knight Sudoku 9x9

↓ B

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

→ A

Key: 876914352,719682435

No Touch Sudoku 6x6

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

Key: 654231,351462

No Touch Sudoku 9x9

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

Key: 246598713,715842693

Outside Sudoku 6x6

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

Key: 623451,352641

Outside Sudoku 9x9

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

Key: 492856371,724358961

Skyscrapers Sudoku 6x6

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

Key: 456321,625314

Skyscrapers Sudoku 9x9

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

Key: 463519278,147835692

