

Instructions booklet
for
Sudoku Mahabharat 2023 Finals
&
Indian Sudoku Championship 2023



28th May 2023

Finals: Starts at 9:00 AM Total Solving Time: 270 minutes Total Points: 2600 + Bonus + Base points	Round 1 – The Classics	40 minutes: 400 points
	Round 2 – The Seen	70 minutes: 700 points
	Round 3 – And the Unseen	90 minutes: 900 points
	Round 4 – Two Way Relay	70 minutes: 600 points

About this document:

These are the instructions for the 2023 Sudoku Mahabharat + Indian Sudoku Championship Finals, organized by Logic Masters India. Any questions related to these instructions should be raised and discussed at

<https://logicmastersindia.com/forum/forums/thread-view.asp?tid=3079>

Schedule on 28th May 2023

Time	Activity
9:00-9:15	Distributing welcome kits, completing registration
9:15-10:00	Q & A
10:20-11:00	Round 1
11:10-12:20	Round 2
12:20-1:20	Lunch
1:30-3:00	Round 3
3:10-4:20	Round 4
4:30-5:00	Fun Event
5:00-5:40	SM Playoffs
5:40-6:10	Results & Prize Distribution

Authors & Test-Solvers:

LMI thanks the authors and test solvers for their contributions to ISC 2023:

Bill Murphy (Australia) - Author
Branko Ceranic (Serbia) - Test-Solving
Clover (USA) - Author
James Peter (India) - Author
Madhav Sankaranarayanan (India) - Author
Nikola Zivanovic (Serbia) - Author
Sed Holaysan (Philippines) - Author
Tantan Dai (China) - Test-Solving
TiiT Vunk (Estonia) - Test-Solving
Wessel Strijkstra (Netherlands) - Author
Yuehi Kusui (Japan) - Test-Solving

General Structure of the finals

There will be 4 rounds in the finals, of varying lengths and of varying points. Scores from each round, along with bonus if any, will be added up to the base points to determine the final score of the player. This score will be used for ranking in Indian Sudoku Championship 2023.

There will be a separate ranking after these rounds, based on SM eligibility, to determine the Sudoku Mahabharat winner.

Scoring

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

Bonus

It is possible that some players may finish all Sudokus in a round before the time allocated. A bonus of **10 points** for each full minute remaining will be awarded to any competitor who correctly solves every Sudoku in a round.

Ties will be broken using following rules:

- i) Maximum points in Round 3 (including bonus points in Round 3)
- ii) Maximum points in Round 2 (including bonus points in Round 2)
- iii) Maximum points in Round 1 (including bonus points in Round 1)
- iv) Maximum points in Round 4 (including bonus points in Round 4)

If there is still a tie to determine the first three positions, tie-breaker Sudokus will be used.

SM Rules:

The top “inexperienced” players will be ranked according to their scores, to determine the Sudoku Mahabharat Winner. Ties will be broken using the above tie breaker rules. There will be a play-off for the top 5 eligible participants to determine the SM winner.

Practice Materials

The online rounds of Sudoku Mahabharat will serve as great practice materials for the finals. You can access the Sudokus at <http://logicmastersindia.com/lmitests/downloads.asp?testFilter=SM>

Prohibited Materials

Any kind of external help from other persons, mobile, solvers, computers, etc is not allowed.

Sudoku rules

The remaining pages in this booklet explain the rules of the types that will appear in the finals.

Changelog (v2)

- Included the detailed schedule
- Included the points distribution
- Removed Consecutive Sudoku from Round2. There are only 10 puzzles in this round now.

List of ISC Winners (2015-2022)

<u>Year</u>	<u>1st</u>	<u>2nd</u>	<u>3rd</u>
2022	Prasanna Seshadri	Rohan Rao	Kishore Kumar
2021	Rohan Rao	Prasanna Seshadri	Kishore Kumar
2020	Rohan Rao	Prasanna Seshadri	Rishi Puri
2019	Rohan Rao	Kishore Kumar	Prasanna Seshadri
2018	Rohan Rao	Prasanna Seshadri	Pranav Kamesh
2017	Rohan Rao	Kishore Kumar	Rishi Puri
2016	Rohan Rao	Rakesh Rai	Kishore Kumar
2015	Rishi Puri	Prasanna Seshadri	Rohan Rao

List of SM Winners (2015-2022)

<u>Year</u>	<u>1st</u>	<u>2nd</u>	<u>3rd</u>
2022	Nityant Agarwal	Aashay Patil	Puwar Dhruvarajsinh
2021	Nityant Agarwal	James Peter	Aashay Patil
2020	Aashay Patil	Jayant Ameta	Shambo Debnath
2019	Pooja Bansal	Aashay Patil	Avinash
2018	Shaheer Rahman	Aashay Patil	Kartik Reddy
2017	Pranav Kamesh	Jayant Ameta	Hemant Malani
2016	Akash Doulani	Gaurav Jain	Harmeet Singh
2015	Amit Sowani	Rakesh Rai	Gaurav Jain

This Round will have 10 Classic Sudokus.

Sudoku	Points
Classic Sudoku 1	20 points
Classic Sudoku 2	20 points
Classic Sudoku 3	30 points
Classic Sudoku 4	25 points
Classic Sudoku 5	30 points
Classic Sudoku 6	30 points
Classic Sudoku 7	40 points
Classic Sudoku 8	55 points
Classic Sudoku 9	50 points
Classic Sudoku 10	100 points

(1-10). Classic Sudoku (20+20+30+25+30+30+40+55+50+100 points)

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

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

70 min

700 points

The Seen

2. Pointing Evens Sudoku (50 points)

Apply classic Sudoku rules. Digits outside the grid indicate the number of even digits in the direction of the arrow.

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

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

3. Killer Sudoku (55 points)

Apply classic Sudoku rules. Additionally, the sum of digits in cells inside every cage must equal the total given for the cage at the upper left cell. Digits do not repeat inside a cage.

8		16		20		6		
22		15		9		13		30
	24	8		28	10		15	
19		8		8			24	
	21	7		8		10		16

8	3	4	16	6	9	20	5	6
22	5	1	15	2	9	4	13	30
	2	7	9	1	5	3	4	8
	8	5	8	7	28	10	6	15
19	7	6	4	9	8	2	1	5
	9	2	8	3	5	6	8	7
	6	3	7	4	8	1	9	10
	1	8	5	3	7	6	2	9
	4	9	7	8	2	5	3	6

4. Thermo Sudoku (55 points)

Apply classic Sudoku rules. Digits along each thermometer are strictly increasing from its bulb to each of its ends.

4								2
9		2	5					4
	4				5	2		9
2								4

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

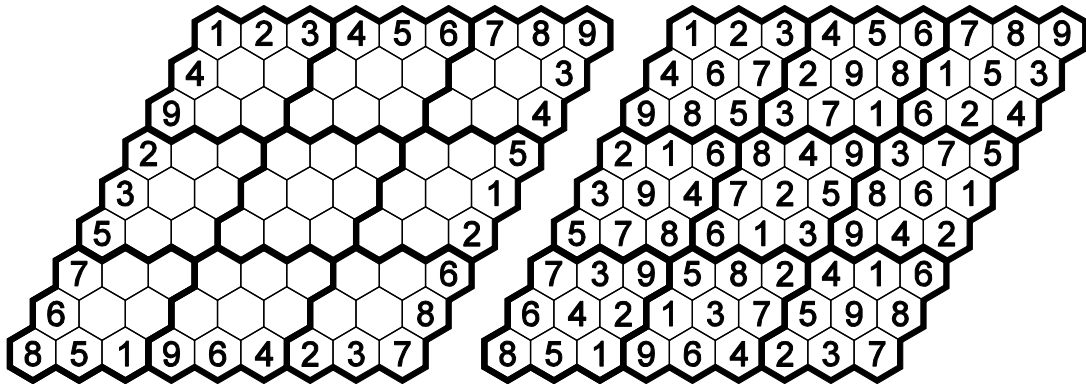
70 min

700 points

The Seen

8. Hex Sudoku (75 points)

Apply classic Sudoku rules. Digits do not repeat along any of the three directions in which the hexagonal cells share edges of a line.



9. XV Sudoku (125 points)

Apply classic Sudoku rules. 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.

5			x	4			x	7
		v	x				v	
			x					
				v			x	
2				x				3
			x		v			
x			x					x
							x	
	v			v				
8				6				4

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

10. Pencilmarks Sudoku (40 points)

Apply classic Sudoku rules. Additionally, in some cells you find all allowed candidates for the specific cell.

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

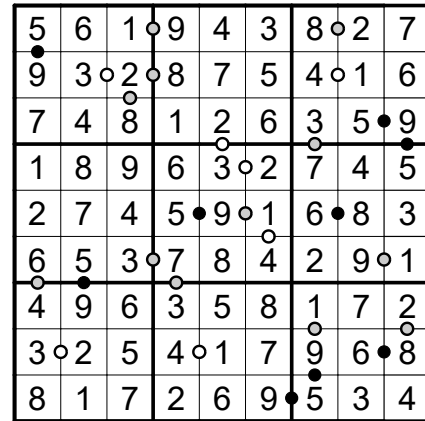
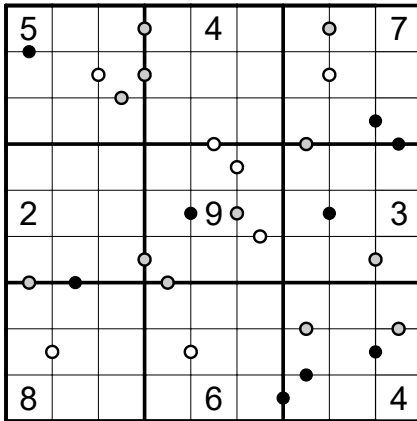
8	1 4 7	5 6 9	1 2	1 4	4	6 9	1 3	1 3	9
4	4 3	4 2 3	1	7	5	9	1 8	6 3	7 3
6	1	4 9	3	7	8	4 3	5	4 6	2 6
2	4 5	1	1 4	9	3	7	9	4 8	6 6
9	4 6	8	4 6	2	5	7	1 7	3	1 6
7	6	3	1 9	3	1	4 8	2	5	4
1	8	4	5	9	2	3	4 6	4 7	4 3
3	2	1 7	1	8	4 6	4	1	4 9	4 5
5	9	6	1 3	2	7	1	1	4	8

This Round has ten sudoku variants which are seen less frequently in competitions.

Variant	Points
Confetti Sums Sudoku	55 points
First Seen Odd/Even Sudoku	55 points
Position Sudoku	50 points
Slanted Killer Cages Sudoku	115 points
Nine Pins Sudoku	95 points
Mathrax Sudoku	70 points
Max Ascending Sudoku	100 points
Quad Sums Sudoku	80 points
Rossini Sudoku	110 points
Arrow or Thermo Sudoku	170 points

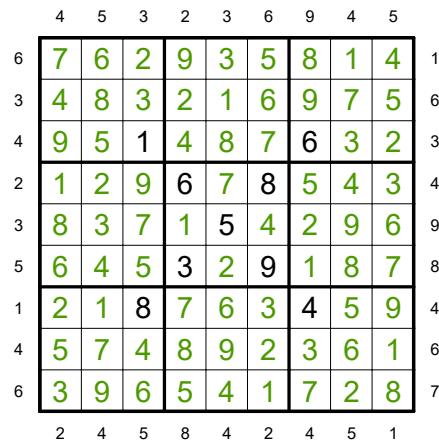
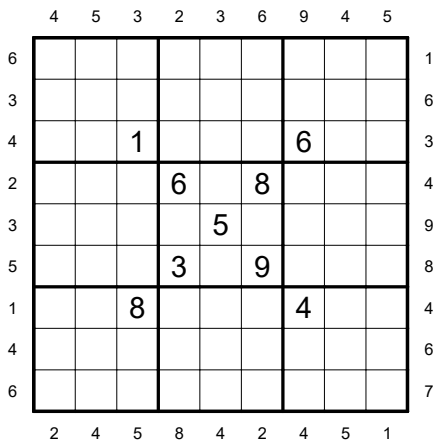
1. Confetti Sums Sudoku (55 points)

Apply classic Sudoku rules. All pairs of digits having sums of A, B and C are marked with circles of white, grey, and black colors respectively. A, B and C have different values and need to be determined as part of solving.



2. First Seen Odd/Even Sudoku (55 points)

Apply classic Sudoku rules. Clues adjacent to a row or column give the first odd (if the clue is odd) or first even (if the clue is even) digit in that row or column from the direction of the clue.



90 min

900 points

And The Unseen

3. Position Sudoku (50 points)

Apply classic Sudoku rules. Numbers outside the grid indicate the position of the largest digit in the first three cells.

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

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

4. Slanted Killer Cages Sudoku (115 points)

Apply classic Sudoku rules. Digits in cages must sum to the given total and must not repeat. Digits in cells containing diagonal lines contribute half their value to the total of the cage and may belong to more than one cage.

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

5. Nine Pins Sudoku (95 points)

Apply classic Sudoku rules. Each digit from 1 to 9 must form a diagonal triplet (three of same digit along a diagonal line) at least once.

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

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

90 min

900 points

And The Unseen

6. Mathrax Sudoku (70 points)

Apply classic Sudoku rules. Some intersections of the grid lines are marked by a number and an operator (+, -, X, /) in a circle. The number is the result of the operation, applied to both pairs of diagonally opposite cells. An "E" in the circle indicates that all four adjacent digits are even; an "O" indicates that all four adjacent digits are odd.

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

7. Max Ascending Sudoku (100 points)

Apply classic Sudoku rules. Each clue adjacent to a row or column gives the exact length of the longest contiguous run of increasing digits within that row or that column, counting from the direction of the clue.

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

8. Quad Sums Sudoku (80 points)

Apply classic Sudoku rules. A dot at a corner implies that one digit is the sum of the remaining three digits at that corner. Not all dots are given.

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

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

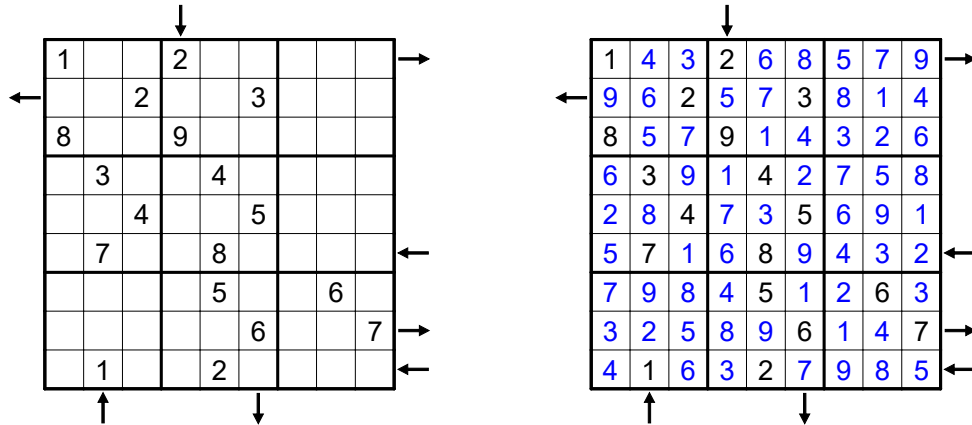
90 min

900 points

And The Unseen

9. Rossini Sudoku (110 points)

Apply classic Sudoku rules. Each arrow outside the grid indicates that the digits within the first box (till the next bold line) in the corresponding direction are in ascending order in the direction of the arrow. All such arrows are marked.

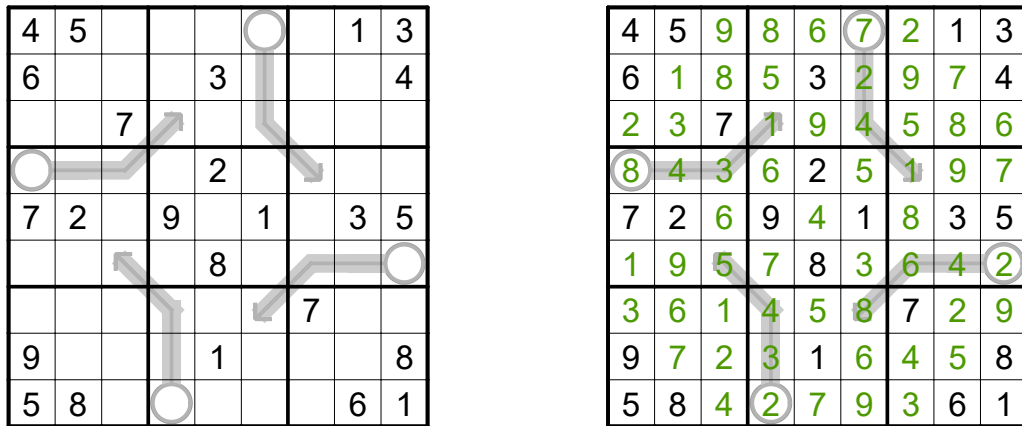


10. Arrow or Thermo Sudoku (170 points)

Apply classic Sudoku rules. Each line is either a Thermo from the given bulb, or an Arrow with the given head. Exactly half of the lines are Thermos and half are Arrows.

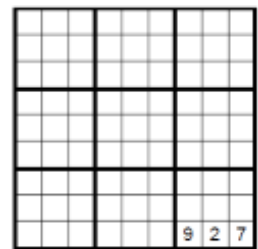
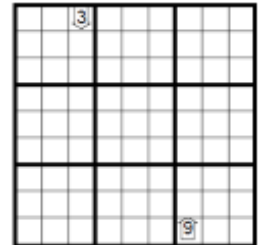
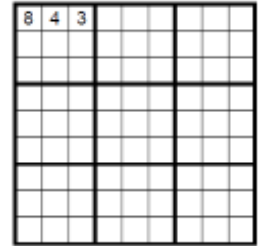
Arrow Sudoku: Digits in the circled cells must be the sum of the digits along the arrow pointing out of it. Digits can repeat on the arrow.

Thermo Sudoku: Digits along each thermometer are strictly increasing from its bulb to each of its ends.



General rules:

- This round consists of 9 puzzles, 3 Classic Sudokus and 6 Sudoku Variants. The first and last puzzle are solvable by themselves.
- In other puzzles, there are some arrows.
- The digit from the same cell from the **previous sudoku** should be transferred to the **downward-pointing arrow**.
- The digit from the same cell from the **next sudoku** should be transferred to the **upward-pointing arrow**.
- Some sudokus may have multiple solutions but the complete round can be solved in only one way.
- Partial points will be given only for every correct grid which is part of the complete solution.
- Points will be awarded based on the number of sudokus solved correctly as part of the overall solution.



Variant	Points
1 Sudoku	30 points
2 Sudokus	90 points
3 Sudokus	150 points
4 Sudokus	220 points
5 Sudokus	290 points
6 Sudokus	360 points
7 Sudokus	440 points
8 Sudokus	520 points
9 Sudokus	600 points

70 min

600 points

Two Way Relay

1,4,7. Classic Sudoku

Refer to rules and example in round 1.

2. Irregular Sudoku

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

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

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

3. Product Frame Sudoku

Apply classic Sudoku rules. Numbers outside the grid equal the product of the first three numbers in the corresponding row or column in the given direction.

90	28	144		144	280	108	12	
84								
27				7				120
	4						2	
		1						
40								27
				3				
	6						4	
315			3					96
								135
	18	240	84		10	54	96	70

90	28	144		144	280	108	12		
84	6	7	2	4	3	5	8	9	1
27	3	1	9	2	8	7	5	6	4
	5	4	8	8	6	1	7	2	3
	7	3	6	1	9	2	4	5	8
40	4	2	5	6	7	8	3	1	9
	8	9	1	5	4	3	2	7	6
	2	6	3	8	5	9	1	4	7
315	9	5	7	3	1	4	6	8	2
	1	8	4	7	2	6	9	3	5
		18	240	84		10	54	96	70

5. Palindrome

Apply classic Sudoku rules. The digits in the cells with the line form palindromes, i.e. they read the same from both the directions.

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

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

70 min

600 points

Two Way Relay

6. Sandwich

Apply classic Sudoku rules. Numbers outside the grid indicate the sum of digits between 1 and 9 in the corresponding row or column.

	4	32	8	14	26	5	35	8	19	
14										
7										
7										
16				1						
7										
6						9				
11										
8										
2										

	4	32	8	14	26	5	35	8	19	
14	7	9	5	3	2	4	1	6	8	
7	8	6	1	7	9	5	2	4	3	
7	3	4	2	6	8	1	7	9	5	
16	5	8	6	1	7	2	4	3	9	
7	1	7	9	4	6	3	8	5	2	
6	4	2	3	8	5	9	6	1	7	
11	9	5	4	2	1	7	3	8	6	
8	2	1	8	9	3	6	5	7	4	
2	6	3	7	5	4	8	9	2	1	

8. Slot Machine

Apply classic Sudoku rules. The three shaded columns are like a slot machine. The 9 numbers they contain will be in the same sequence. (The strips wrap around the grid for the ordering)

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

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

9. Clone Sudoku

Apply classic Sudoku rules. Digits in each corresponding cell in the shaded figures are identical.

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

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