



इयवठकय महभररत

Offline Finals Instructions Booklet
10th May, Sunday Starts at 09:00
Total solving time 200 minutes
Total points 950 + bonus
Organised by Logic Masters India

Round 1 Yudhisthira	45 minutes
Round 2 Bhima	65 minutes
Round 3 Arjuna	35 minutes
Round 4 Nakula	35 minutes
Round 5 Sahadeva	20 minutes

Introduction

These are the instructions for the 2015 Sudoku Mahabharat, organised by the Logic Masters India. Any questions related to these instructions should be raised and discussed at <http://logicmastersindia.com/t/?tid=941>

Approximate Schedule on 10th May

09:00 to 09:30 Registration
09:30 to 10:00 Q&A
10:00 to 10:45 Round 1 - Yudhisthira
10:55 to 12:00 Round 2 - Bhima
12:10 to 12:45 Round 3 - Arjuna
12:45 to 13:00 Evaluation Protests, if any
12:45 to 14:00 Lunch break
14:00 to 14:35 Round 4 - Nakula
14:45 to 15:05 Round 5 - Sahadeva
15:15 to 15:45 Recreational Activity
15:45 to 16:00 Evaluation Protests, if any
16:00 to 16:15 Tie Breaker, if required
16:15 to 16:30 Awards and Prizes
16:30 to 18:00 (Optional) Open discussion

General Structure of the finals

There will be 5 rounds in the finals, of varying lengths and of varying points. There are no play-off rounds, so every player will need to participate in each of the rounds. Scores from each round, along with bonus if any, will be added up to determine the final score of the player and the winners of Sudoku Mahabharat.

Scoring and Bonus

WSC style checking will be followed. Points will be awarded only if all cells have exactly 1 digit clearly written. There will be no partial credit for any Sudoku. Sudokus with blank cells or unclearly written digit will be awarded with 0 points.

It is possible that some players may finish all Sudokus in a round before the time allocated. A bonus of 5 points for each full minute remaining will be awarded to any competitor who correctly solves every Sudoku in a round. In the case of a single minor mistake in the whole round, 4 points for each full minute will be awarded. "A single minor mistake" is defined as at most two incorrectly placed numbers or blank cells in at most one Sudoku in the whole round.

Ties will be broken using following rules:

- i) Maximum points in Round2 (including bonus points in Round2)
- ii) Maximum points in Round4 (including bonus points in Round4)
- iii) Maximum points in Round3 (including bonus points in Round3)
- iv) Maximum points in Round1 (including bonus points in Round1)

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

Competition Hall Rules

- Competitors should ensure that they are ready at their desk for the start of each round. Each round will start strictly on time. **Those arriving late for the round will lose solving time.**
- Prior to the start of each round competitors will be handed over the Sudoku booklet for that round. They should clearly write their name and contact number on the front of their competition booklet. Competitors must not open their booklet at this stage.
- Once the signal to start a round is given, competitors may open their booklet and begin solving the Sudokus.
- During rounds, competitors must remain silent, unless declaring completion of a round.

- If you finish solving all Sudokus in a round and want to claim bonus points, close your booklet, clearly state 'finished' and raise your arm. Keep your arm raised until your paper has been collected. Once your paper is collected, it will not be returned to you for any more changes. Competitors that complete a round are expected to remain seated so as not to cause unnecessary disruption to fellow competitors.
- Once the signal to finish a round is given, competitors must immediately stop solving, close their booklet and put their pen/pencil down and be ready to hand over their booklet.
- At the end of a round you must remain seated until all Sudoku booklets have been collected. You will be told when you can get up and leave.
- Mobile phones are not permitted to be used in the competition hall and must be turned off or put in silent mode.
- If you believe that there is a problem with any Sudoku, leave that Sudoku and continue with another. This will be investigated upon completion of the round.
- Sudokus can be completed in any order. The point value of a Sudoku is an indication of its anticipated difficulty, although your solving experience may differ.

Permitted Items

- The permitted items which may be taken into the competition hall and used are: Pens, pencils, erasers, rulers, instruction booklets (optionally annotated with notes regarding instructions and preparation notes) and blank paper.
- Players are expected to carry a copy of this instructions booklet. It will not be provided at the finals.
- Drinks and snacks will be allowed so long as they don't disturb other competitors (e.g. rustling a crisp packet, or a very strong smell).
- Participants may choose to use any pens or pencils in any colour except red colour in all rounds.
- Electronic devices (including but not limited to cell phones, laptops, tablets, calculators, and headphones) are not allowed to be used during the competition.
- Any other items brought into the hall must be left in a bag on the floor or nearby, so as not to block the aisles.

Evaluation

- Once a round has been fully evaluated, the booklets will be returned to you.
- If you have a concern about the evaluation, you need to raise it with the organizers during the Evaluation Protests sessions. The organisers will re-evaluate your paper, however, **the decision of the organisers will be final.**
- Your paper may be photographed during the evaluation phase.

Breach of Rules

Any breach of these rules may lead to a competitor being disqualified from the competition.

Points Table

Round 1 Yudhisthira	45 minutes 225 points	10 x Classic Sudoku	15x3+20x2+25x3+30x1+35x1
Round 2 Bhima	65 minutes 325 points	Odd Even Sudoku	40
		Inequality Sudoku	35
		Killer Sudoku	40
		Arrow Sudoku	30
		Outside Sudoku	35
		Extra Region Sudoku	45
		Toroidal Sudoku	65
		Consecutive Sudoku	35
Round 3 Arjuna	35 minutes 175 points	2 x Classic + Classic + Classic	5+10+5, 5+5+5
		Classic + Diagonal + Diagonal	5+10+10
		Classic + Irregular + Irregular	5+20+15
		Classic + Either Or + Either Or	5+15+15
		Classic + Skyscraper + Skyscraper	10+15+15
Round 4 Nakula	35 minutes 175 points	Expanded Sudoku	40
		Overlapping Sudoku	60
		Compressed Sudoku	30
		Linked Classics	45
Round 5 Sahadeva	20 minutes 50 points	???	???

Sudoku rules and examples

The remaining pages in this booklet explain the rules of the types that will appear in the finals, along with an example. The examples are a true reflection in quantity, grid dimension and format of the corresponding competition Sudokus. The competition Sudokus will appear at a significantly larger size – mostly one per page. The difficulty of an example is not necessarily reflective of the difficulty of the corresponding competition Sudoku.

The example Sudokus are from online rounds of Mahabharat in most cases, and are from other LMI contests in few cases.

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45 minutes

225 points

Round 1
Yudhisthira

This round will have 10 classic Sudokus, of varying difficulties. They will be sorted in ascending order of points.

10 X 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.

Points – 15X3 + 20X2 + 25X3 +
30X1 + 35X1

	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

This round will have 8 selected variants from the online rounds, with at least one from each online round.

Odd Even 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. Additionally, Cells with circles must contain odd digits (1,3,5,7,9). Cells with squares must contain even digits (2,4,6,8).

40 points

			6	1	5			
		1	■	■	■	5		
	4	●				■	2	
4	●			5			●	7
1	●		●	2	●		●	6
2	●			3			●	5
	3	■				●	4	
		7	■	■	■	1		
			3	8	7			

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

Inequality 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. There are 'greater than' (>) and 'less than' (<) signs. The cell with the open end of the sign should be greater than the cell with the pointed end of the sign.

35 points

	7		1		4			
	9		2		8			
	2		6		7			

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

Killer 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. 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.

40 points

12		9		22	7		20	
	18						18	
16			45					7
	12				45			
					9			
24								11
	23				10			
9		13	15		18			24

12	6	5	9	4	3	22	9	7	1	2	29	7	8
	1	3	8		2	6	7		4	18	9	5	
16	9	2	7		45	4	8		3	6	7	1	
	5	1	3		9	7	6		45	8	2	4	
	4	7	6		1	8	2		9	9	5	3	
24	8	9	2		4	3	5		7	1	6		
	7	28	9		6	1	4		16	5	3	2	
9	3	6	5		8	2	9		1	4	24	7	
	2	4	1		7	5	3		6	8	9		

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65 minutes

325 points

Round 2

Bhima

Arrow 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. The sum of the digits along the path of each arrow must equal the digit in the circled cell. Digits can repeat within an arrow shape.

30 points

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

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

Outside 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. The digits outside the grid must appear in one of the cells in the first box (till the next bold line) seen from that edge of the grid

35 points

45										2	
3										9	
6										4 5 8	
14				6						8	
29										5	
3										9	
7										8	
89										3 7	
2										9	
	9	3	2	4	2	6	1	5	4		
		5	4		5		9				

45	7	4	5	6	9	8	3	2	1	2	
3	3	8	1	5	4	2	6	7	9	9	
6	2	9	6	1	7	3	8	4	5	4 5 8	
14	4	1	7	9	6	5	2	8	3	8	
29	8	2	9	7	3	4	5	1	6	5	
3	5	6	3	2	8	1	4	9	7	9	
7	6	7	4	3	2	9	1	5	8	8	
89	9	5	8	4	1	6	7	3	2	3 7	
2	1	3	2	8	5	7	9	6	4	9	
	9	3	2	4	2	6	1	5	4		
		5	4		5		9				

Extra Regions 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. Additionally, each extra region must contain digits from 1-9. The extra regions are of 9 cells each and are shaded in the grid.

45 points

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

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

Toroidal Sudoku

Place a digit from 1 to 9 in each empty cell so that each digit appears exactly once in each row, column and outlined region. Some of the outlined regions wrap between the top and bottom edges, and/or the left and right edges of the grid.

65 points

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

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

Consecutive 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. Orthogonally adjacent cells containing consecutive numbers are separated by bars. All possible bars are marked.

35 points

	2							3
	3							2
				3	2			
		3	2					
		2				3		
				3	2			
			3	2				
3							2	
2							3	

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

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35 minutes

175 points

Round 3

Arjuna

This round will have 18 6X6 Sudokus, split into 6 relays with 3 Sudokus in each. In each relay, the top grid is a classic Sudoku. The middle grid and bottom grid are classic Sudoku for first two relays, and variants in the remaining four relays.

In each relay, solve the top grid. Copy the digits marked with letters to middle grid and then solve the middle grid. Then copy the digits marked with letters to bottom grid and solve the bottom grid.

Note that the top grid is always independently solvable. The middle grid can only be solved after copying the clues from top grid. Similarly the bottom grid is solvable only after copying from the middle grid. Each grid will have its own points. It is required to completely solve each of the grids to get points.

2 X Relay Sudoku (Classic -> Classic -> Classic)

Standard Sudoku rules apply to each of the grids.

5+10+5, 5+5+5 points

	4	5			F
2	3			E	
1			D		
		C			4
	B			4	3
A			1	2	

	5				F
3				E	
			D	G	H
		C		I	J
	B				2
A				6	

1				3	
5	2				
			G	H	
			I	J	
6	5				
4				5	

6	4	5	2	3	F
2	3	1	4	E	5
1	5	4	D	3	6
3	2	C	6	5	1
5	B	1	2	6	4
A	4	6	3	1	2

2	5	4	6	3	F
3	6	1	2	E	5
5	4	2	D	G	H
1	3	C	6	I	J
6	B	1	3	5	4
A	4	2	5	1	6

1	6	4	5	3	2
5	2	3	1	6	4
2	4	5	3	G	H
3	1	6	4	I	J
6	5	1	2	4	3
4	3	2	6	5	1

Relay Sudoku (Classic -> Diagonal -> Diagonal)

Standard Sudoku rules apply to each of the grids. In the diagonal grids, each digit appears exactly once in the diagonals.

5+10+10 points

	6	3			
	1	2			
	3	4			
A	B		3	6	
C			6	5	
			4	2	

			2		
				3	
			D	E	
A	B		F	G	
C		1			
	4	5			

	2	1			
			D	E	
			F	G	
	6	2			

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35 minutes

175 points

Round 3

Arjuna

5	6	3	1	4	2
4	1	2	5	3	6
6	3	4	2	1	5
^A 1	^B 2	5	3	6	4
^C 2	4	1	6	5	3
3	5	6	4	2	1

5	6	3	4	2	1
4	1	2	6	5	3
3	5	6	2	^D 1	^E 4
^A 1	^B 2	4	3	^F 6	^G 5
^C 2	3	1	5	4	6
6	4	5	1	3	2

3	2	1	5	4	6
6	4	5	1	2	3
2	5	6	3	^D 1	^E 4
1	3	4	2	^F 6	^G 5
4	1	3	6	5	2
5	6	2	4	3	1

Relay Sudoku (Classic -> Irregular -> Irregular)

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

5+20+15 points

		4	6		
	6			3	
4					2
5					4
2	^A	^B	^C	^D	6

	5	4	1	2	
				^H	
				^G	
		^F			
	^E				
	^A	^B	^C	^D	

4	5				
6				^H	
				^G	
				^F	
				^E	

6	5	1	2	4	3
3	2	4	6	5	1
1	6	2	4	3	5
4	3	5	1	6	2
5	1	6	3	2	4
2	^A 4	^B 3	^C 5	^D 1	6

6	5	4	1	2	3
4	3	1	6	^H 5	2
1	2	5	^G 3	6	4
5	6	^F 2	4	3	1
3	^E 1	6	2	4	5
2	^A 4	^B 3	^C 5	^D 1	6

4	5	6	1	2	3
6	3	1	4	^H 5	2
1	2	5	^G 3	4	6
5	4	^F 2	6	3	1
3	^E 1	4	2	6	5
2	6	3	5	1	4

Relay Sudoku (Classic -> Either Or -> Either Or)

Standard Sudoku rules apply to each of the grids. In the Either Or grids, A digit between two cells must appear in one of those 2 cells.

5+15+15 points

		^A	^B		
		4	6		
	6			3	
4					2
5					4
2					6

^C		^A			^D
	3		^B		3
		4		3	2
3				5	4
	4				
5		2		6	
					1

^C					^D
		5	1		
	4			3	
3					
	4		5		4
				6	
5		2			1

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35 minutes

175 points

Round 3

Arjuna

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

C 2	5	A 1	6	3	D 4
4	3	6	B 2	1	5
6	1	4	3	5	2
3	2	5	1	4	6
1	4	2	5	6	3
5	6	3	4	2	1

C 2	1	3	6	5	D 4
4	6	5	1	2	3
1	5	4	2	3	6
3	2	6	5	4	1
5	4	1	3	6	2
6	3	2	4	1	5

Relay Sudoku (Classic -> Skyscraper -> Skyscraper)

Standard Sudoku rules apply to each of the grids. In Skyscraper grids, consider each number to be the height of a building. The numbers outside the grid indicate how many buildings can be seen when looking in that direction (taller buildings conceal smaller buildings behind them).

10+15+15 points

	A		4	6	
	6	B			3
4			C		2
5				D	4
2					6

			5		
		A			
5		B			
			C		
				D	
					E
					5

			5		
				E	
5				E	
					5

6	5	1	2	4	3
3	A 2	4	6	5	1
1	6	B 2	4	3	5
4	3	5	C 1	6	2
5	1	6	3	D 2	4
2	4	3	5	1	6

			5		
5	6	1	2	4	3
4	A 2	3	5	6	1
5	1	3	B 2	4	5
6	5	4	C 1	3	2
3	1	5	6	D 2	4
2	4	6	3	1	5
					E

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

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35 minutes

175 points

Round 4

Nakula

This round has 4 twisted versions of Classic Sudoku.

Expanded 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 in each of the grid. Two grids are overlapping with gaps in the middle.

40 points

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

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

Overlapping 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 in each of the grid. Two grids are overlapping.

60 points

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

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

इयदोक्य ललहलभरलत

35 minutes

175 points

Round 4

Nakula

Compressed Sudoku

Fill in the whole grid with numbers 1-9 so that no number is repeated within a row, a column or a shaded or an outlined 3x3 box.

30 points

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

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

Linked 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 in each of the grid. Two grids are overlapping.

45 points

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

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

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

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

इयत्तोक्य ललहलत

20 minutes

50 points

Round 5
Sahadeva

Rules about this round will be explained just before the round begins. However, this round will not contain any additional Sudoku types than those that are already listed in the previous four rounds.

all the best