Sudoku Submissions for Puzzle Innovation Contest

(http://wspc2017.logicmastersindia.com/forum/forums/thread-view.asp?tid=1390)

12th WSC

INDIA 2017

Puzzle Innovation Contest

Puzzle Innovation Contest was held at Logic Masters India with an aim to increase the pool of innovation for World Sudoku and Puzzle Championship 2017, and also to recognize the best innovations and innovators. Check details at http://wspc2017.logicmastersindia.com/forum/forums/thread-view.asp?tid=1390.

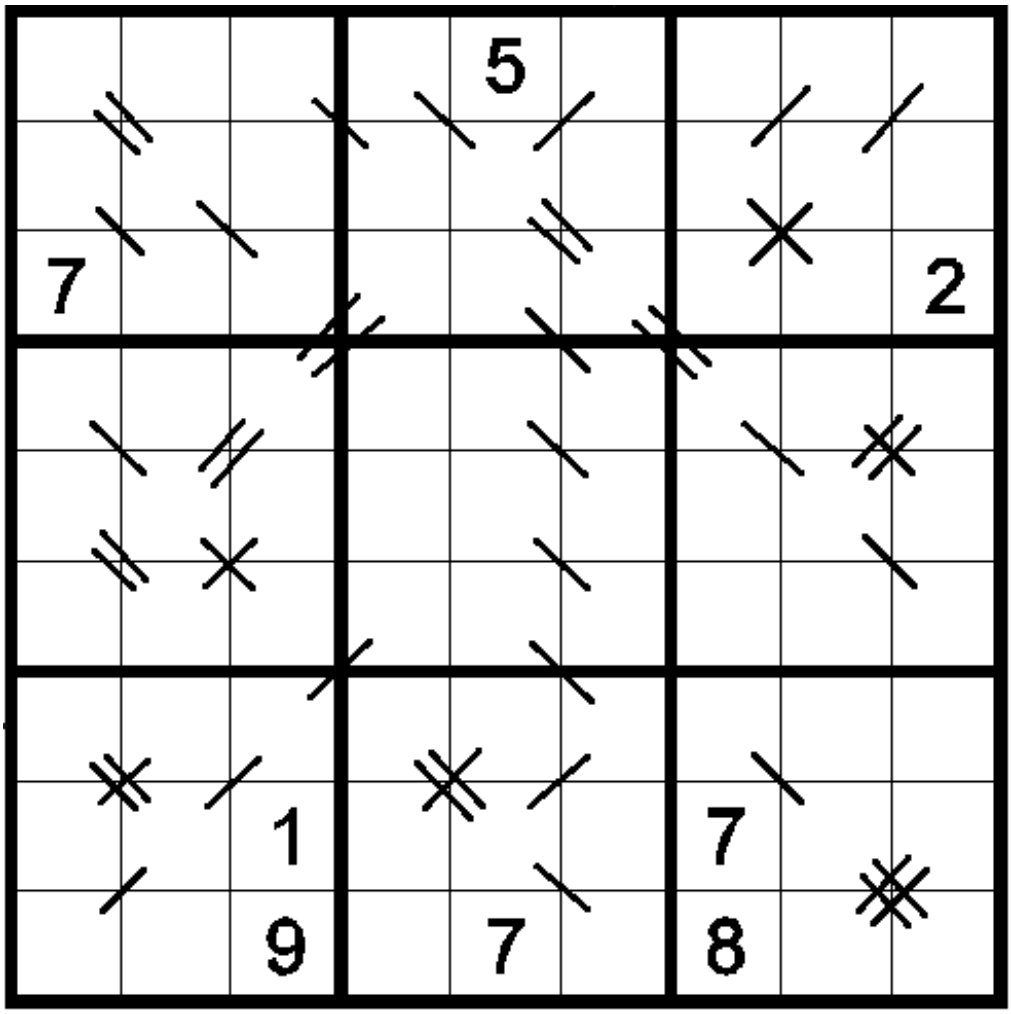
We received as many as 25 submissions for Sudoku ideas, with many promising ones, out of which some will be used in World Sudoku Championship – 2017.

Here is the complete list, sorted alphabetically by authors' names.

Akash Doulani, INDIA	Slant Kropki Untouch 2/2 Sudoku Greater Neighbours Sudoku Mirror Consecutive Sudoku Odd Even Bridge Sudoku Symmetric Parity Sudoku
Anurag, INDIA	Dominos In Sudoku Retro Jigsaw Sudoku
Harmeet Singh, INDIA	Tense Parity Sudoku
Hemant Kr Malani, INDIA	Wild Card Sudoku
Matúš Demiger & Blanka Lehotská, SLOVAKIA	Unique Squares Sudoku
Nikola Živanovic, SERBIA	Trampoline Sudoku Angry Birds Sudoku
Rauno Pärnits, ESTONIA	Camel Sudoku Sudoku Mandala
Takeya Saikachi, JAPAN	Loupe Sudoku
Yannick Meyapin, FRANCE	Prime and Double Sudoku Euclid Sudoku Prime Sudoku Scrabble Sudoku Sudoku Morpion Ten Product Sudoku Tic-Tac-Toe Sudoku Twin Primes Sudoku
Yanzhe Qiu, CHINA	AntiUR Sudoku

Slant Kropki

Apply classic sudoku rules. Single slant implies that the numbers are consecutive. Double slant implies that one number is double of the other. All possible slants are shown.



Solution

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

Untouch 2/2

Apply classic sudoku rules. Diagonally adjacent numbers cannot be half or double of each other.

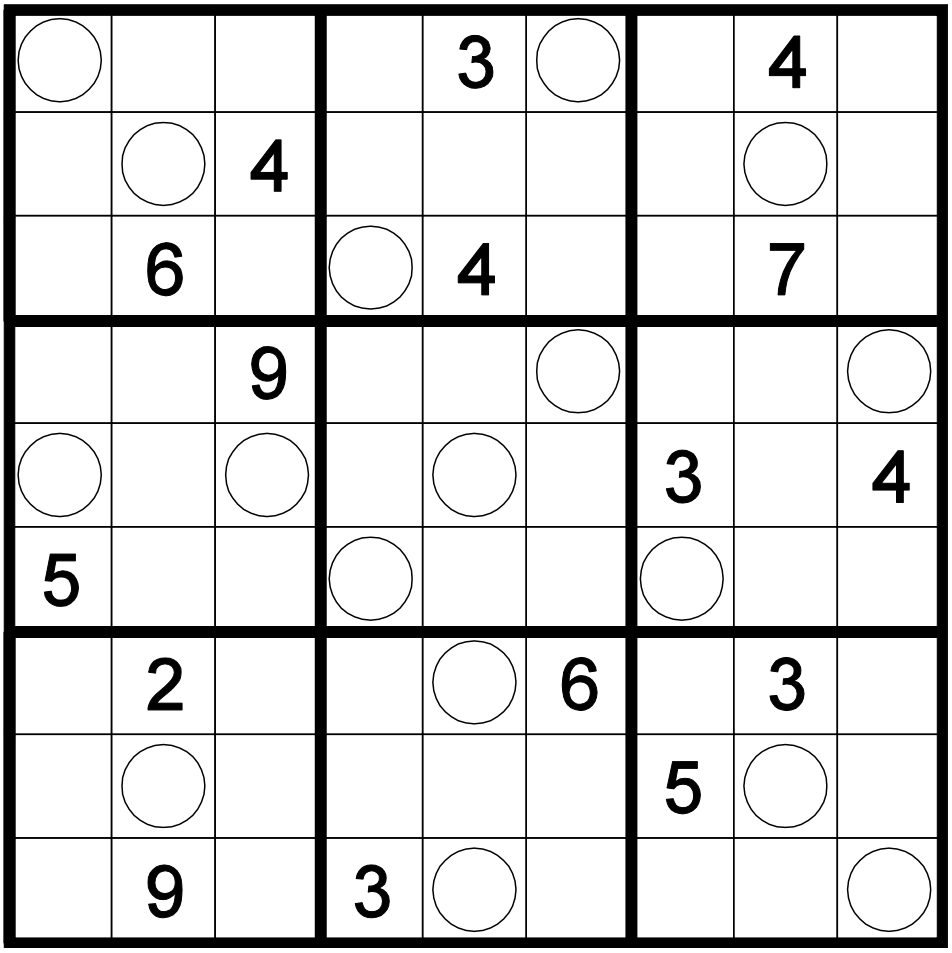
		8	3					9
	3			7				4
	7	4	6	8				
	4			6				
	5			9	8	4	1	
					1			6
					7			1
7					6			8
5					4	7	6	

Solution

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

Greater Neighbours

Apply classic sudoku rules. Some cells are marked with circles. All orthogonal (vertical and horizontal) neighbours of circled cells will have numbers greater than the number in the circled cell. All possible circles are marked.



Solution

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

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

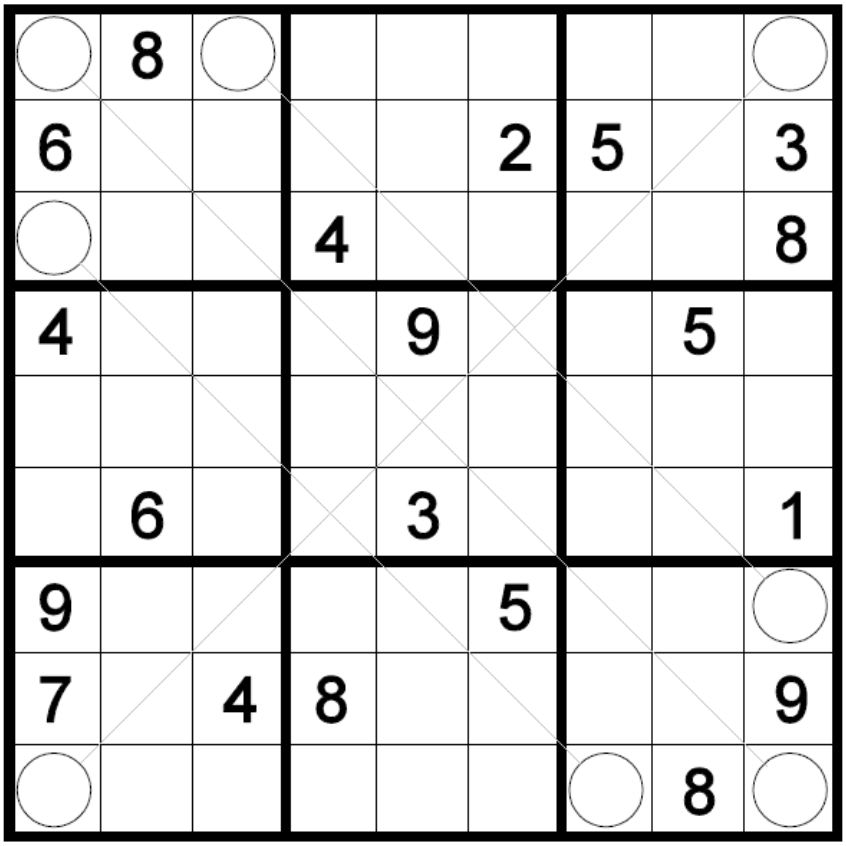
MIRROR CONSECUTIVE SUDOKU : APPLY NORMAL SUDOKU RULES. DIGITS PLACED IN BOTH PAIRS OF 3X3 BLOCKS IN OPPOSITE CORNERS MUST BE CONSECUTIVE RELATIVE TO THE CENTER OF THE GRID. 9 & 1 ARE TREATED AS CONSECUTIVE .

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

SOLUTION

Odd Even Bridge

Apply classic sudoku rules. There are some pairs of circles connected by bridges. Each connected pair of circles has one even number and one odd number. The even number denotes the number of even numbers along the bridge and the odd number denotes the number of odd numbers along the bridge. The numbers on the circles are not counted. Numbers can repeat on the bridges.



Solution

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

SYMMETRIC PARITY SUDOKU : CLASSIC SUDOKU RULES APPLY . ALL NUMBERS WILL HAVE SAME PARITY SYMMETRICAL (R1C1 & R9C9 , R1C2 & R9C8 , R4C4 & R6C6 AND SO ON WILL HAVE SAME PARITY)

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

SOLUTION

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

DOMINOS IN SUDOKU

Fill in the grid with digits 1 to 9 (1 to 6 in the example) such that each row and column contain all the digits 1 to 9. Also, form 9 dominos(6 in the example) that do not touch each other orthogonally. The pair of digits in Every domino has to be unique. The dominos must break the rest of the grid into 9 regions of 7 cells each. Every region must contain 7 different digits. A Domino may span across two regions.

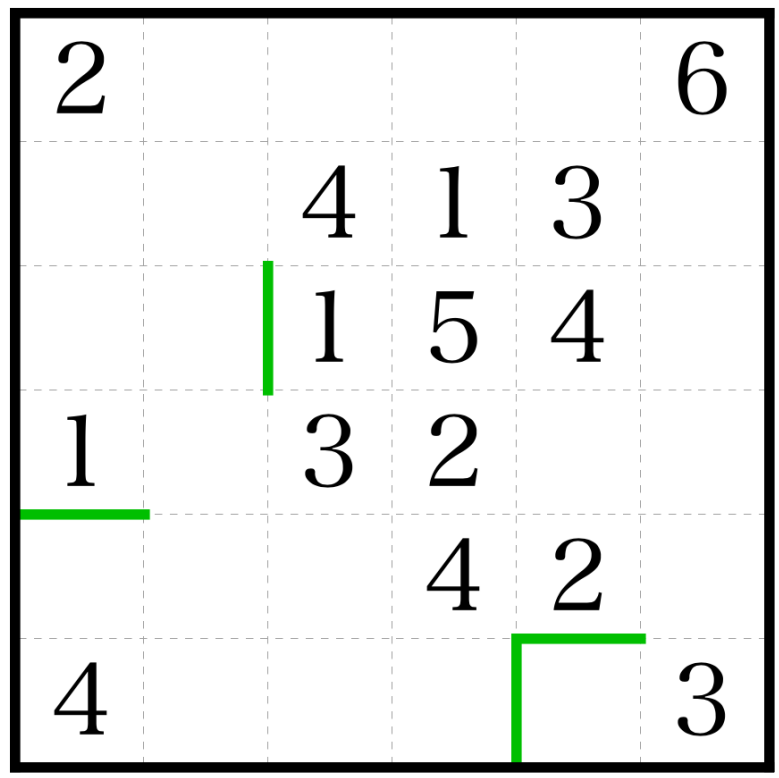
			1	5	
2					6
1				4	
3					1
			5	2	4
	4				

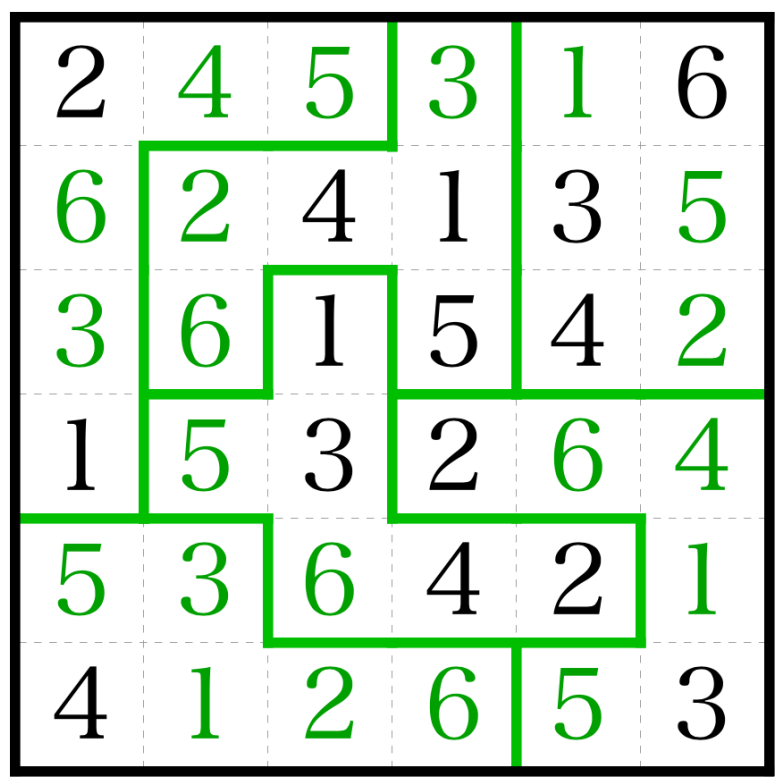
4	6	3	1	5	2
2	1	5	4	3	6
1	2	6	3	4	5
3	5	4	2	6	1
6	3	1	5	2	4
5	4	2	6	1	3

RETRO JIGSAW SUDOKU

Fill in the grid with digits 1 to 9 (1 to 6 in the example) such that each row and column contain all the digits 1 to 9. Build the 9-cell irregular regions so that all regions contain all the digits once.

No two regions may be identical, rotations and reflections are not counted as different. Some borders may already be given.



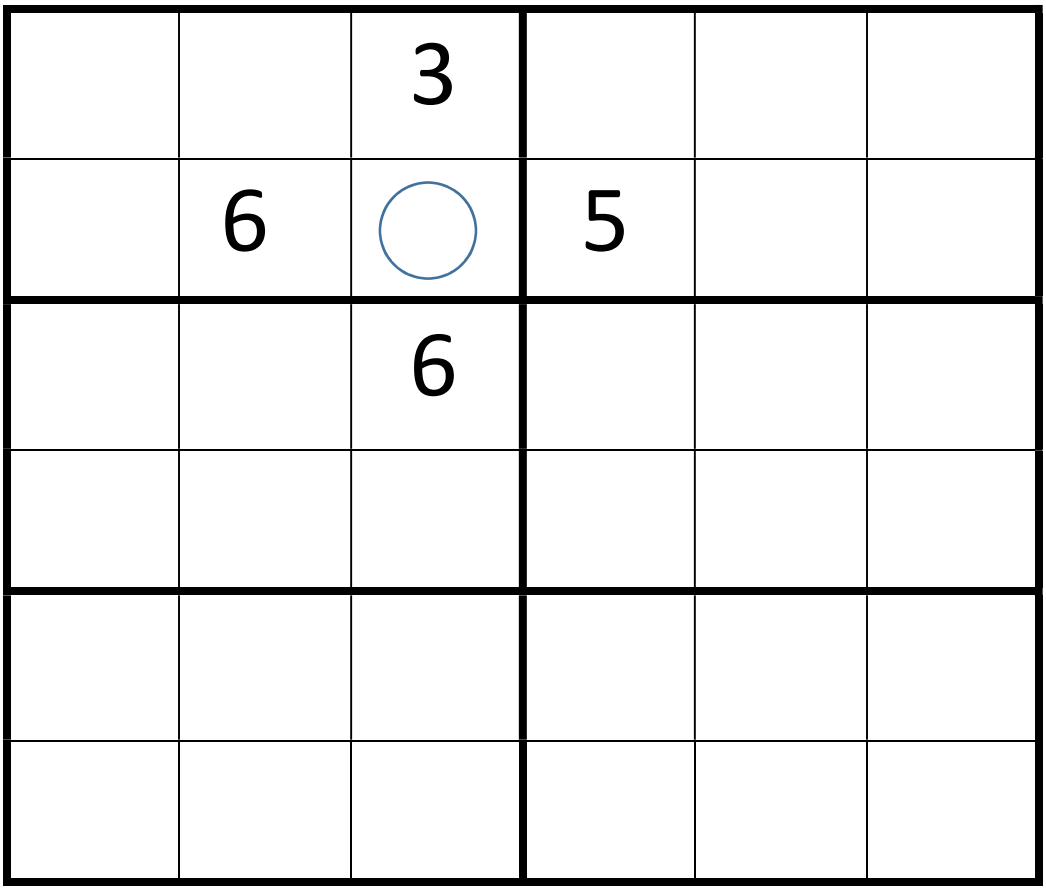


From: Harmeet Singh

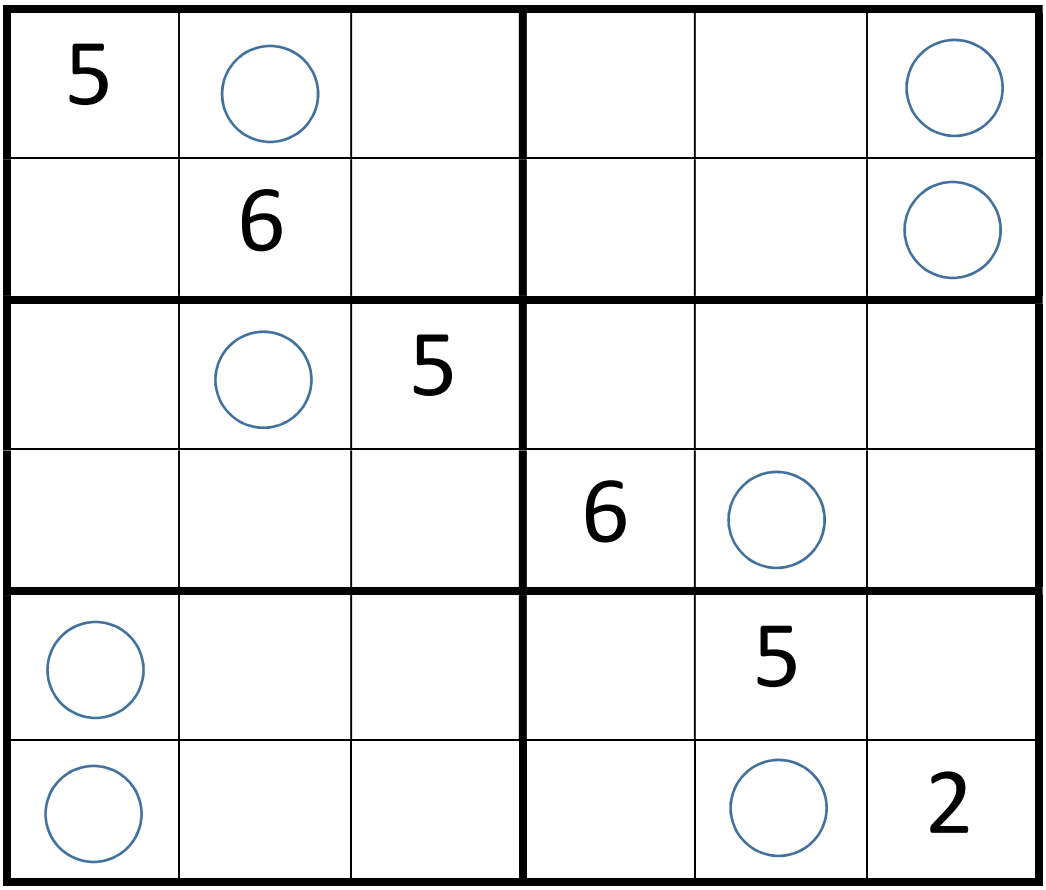
Tense Parity Sudoku:

Tense Parity (Ten's Parity). Apply Sudoku rules. In addition, the circled cells must contain number of the parity same as that of digit of ten's place of the sum of its orthogonal neighbors.

Illustration: Sum of orthogonal neighbors is 20. Its 10's place's number is 2 whose parity is even. Hence, the circled number must be even. In this illustration the options to fill up circled number is 2 or 4.



Example problem:



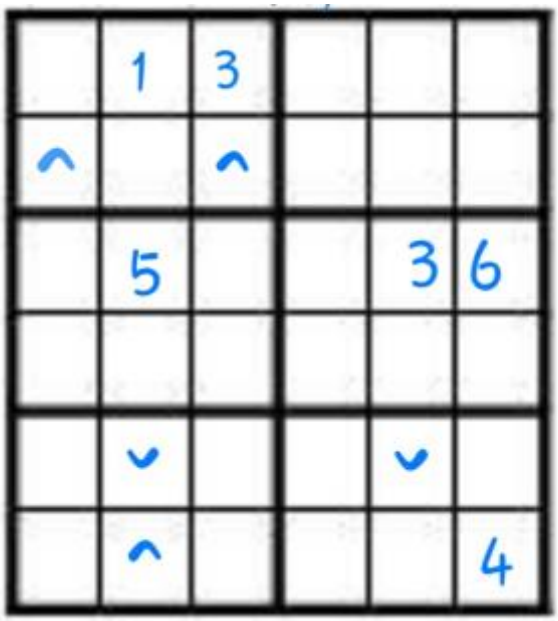
Solution:

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

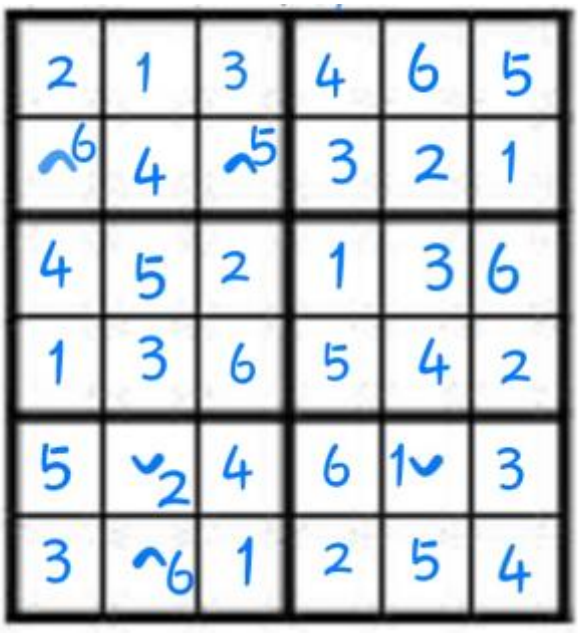
WILDCARD SUDOKU

Rules: Classic rules apply. One number will be a wildcard number. An arrow pointing upwards means that the number in the cell will be greater than wildcard and pointing downwards means number in the cell will be less than wildcard number. The wildcard number may be given or it maybe a part of solving to determine the wildcard number. I've attached two sudokus with given wildcard number and one in which the wildcard number has to be determined.

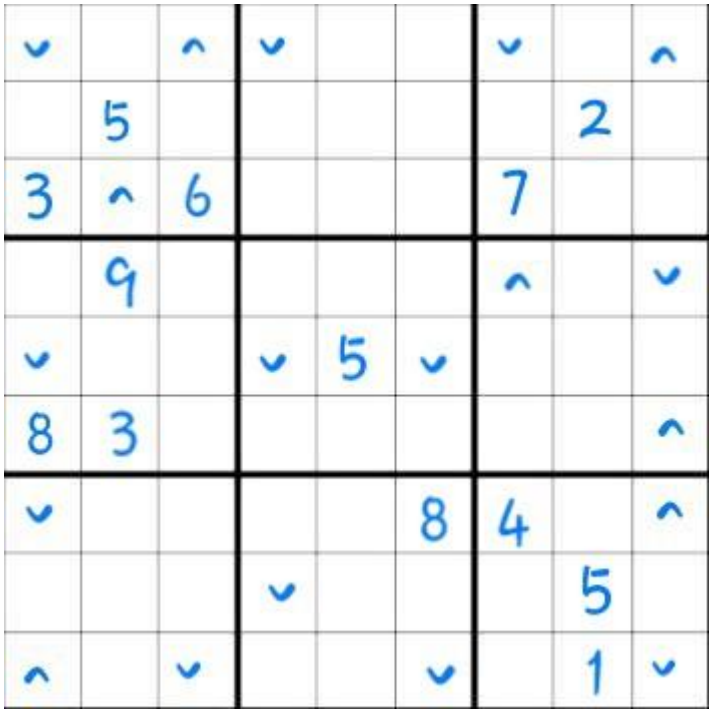
In this 6×6,the wildcard number is 3.



Solution



In this 9×9 the wildcard number is 5.



Solution

In this 6×6 the wildcard number is not given. It is a part of solving to determine the wildcard number.

Solution

UNIQUE SQUARES SUDOKU

(by Matúš Demiger & Blanka Lehotská)

Fill in the grid with numbers from 1 to 9, so that each row, column and outlined region contain each number exactly once. Each square 2x2 contains unique set of numbers.

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

Solution:

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

List of the unique sets used in the example:

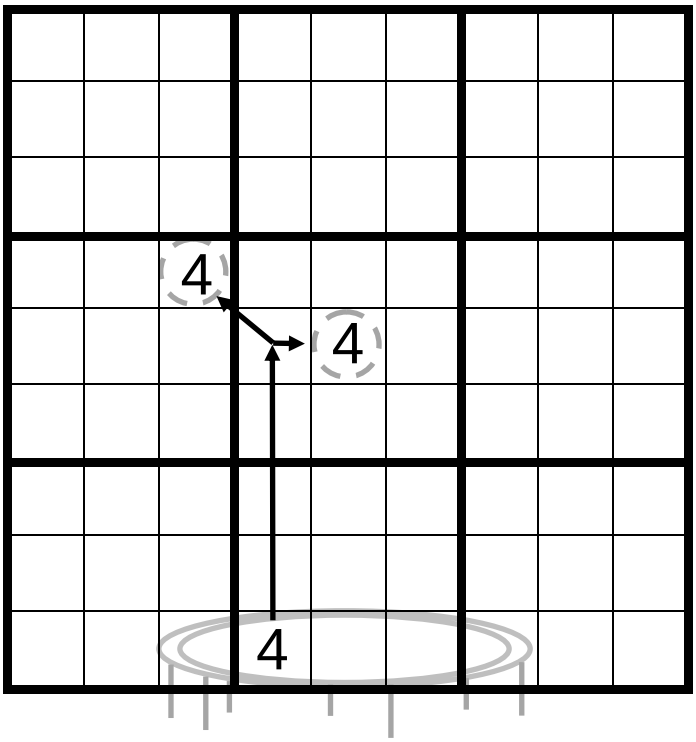
1129	1369	2359	3578
1225	1379	2367	3579
1236	1389	2389	3679
1238	1457	2458	3688
1247	1459	2459	3689
1256	1478	2467	4467
1257	1469	2468	4478
1259	1558	2479	4568
1267	1567	2567	4569
1278	1569	2679	4589
1336	1579	2799	4678
1345	2256	3478	4689
1346	2347	3488	4789
1347	2348	3489	5679
1367	2357	3568	5789
1368	2358	3569	6899

Submitted by Nikola Zivanovic

1. TRAMPOLINE SUDOKU

Apply classic sudoku rules. Five central numbers in the last row are on the trampoline. These numbers are jumping vertically to the height of their distance (i.e. number 4 jumps exactly four cells, number 7 jumps seven cells etc.). At the new height each number must reach two same numbers from the left and from the right column (in orthogonally or diagonally neighbouring cells).

Sample:



PUZZLE

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

Submitted by Nikola Zivanovic

2. ANGRY BIRDS SUDOKU

Apply classic sudoku rules. Numbers 1 acts angry birds and numbers 7, 8 and 9 acts pigs. Each bird is fired into the grid from the side and in each row must be stopped next to the pigs only. In the other words, number 1 in each row must touch digits 7, 8 or 9 only).

PUZZLE

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

SOLUTIONS

TRAMPOLINE

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

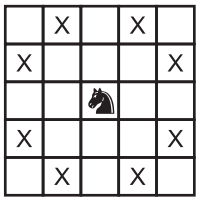
ANGRY BIRDS

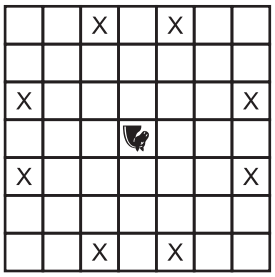
4	7	1	8	5	2	9	6	3
6	9	2	3	4	7	5	8	1
8	5	3	6	9	1	7	2	4
9	6	4	7	1	8	2	3	5
1	8	7	5	2	3	4	9	6
3	2	5	4	6	9	1	7	8
5	3	6	2	7	4	8	1	9
2	4	9	1	8	6	3	5	7
7	1	8	9	3	5	6	4	2

Camel sudoku

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

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





 = 34

Fill in the whole grid with numbers from 1 to 9 so that no digit is repeated within a row, a column or an outlined 3x3 region.

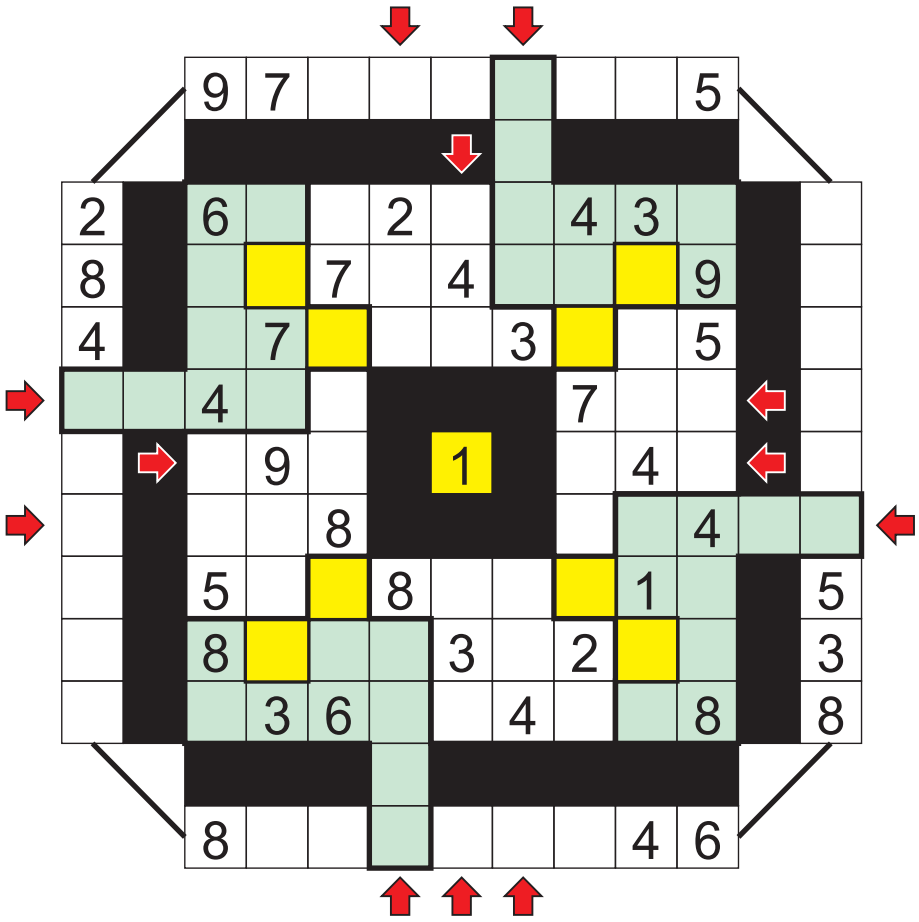
One number is chess knight and another number fairy chess camel . Camel move is similar to knight's, just 1 square longer. Camel can not attack knight and knight can not attack camel. Which numbers are camels and knights, for you to decide.

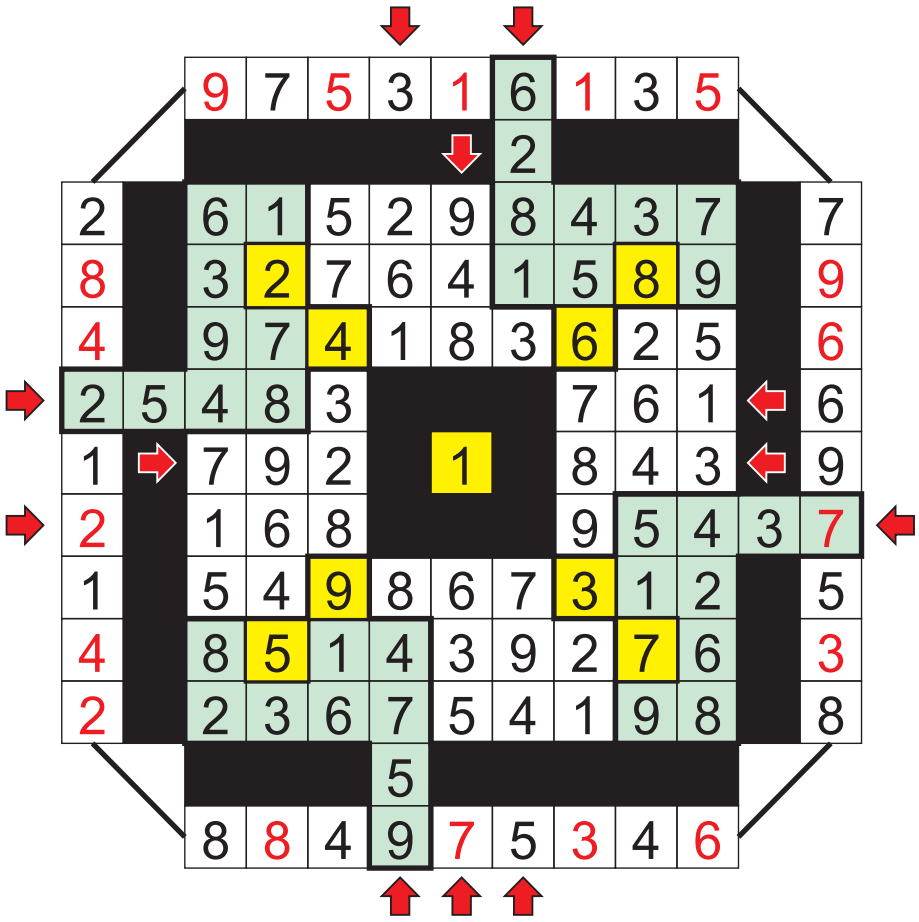
Sudoku-mandala

In outer circle of mandala place numbers 1-9, each four times. Between pair on same numbers must be exactly value-of-number empty cells.

Inside mandala is irregular sudoku, where one area is broken to singel-cell pieces.

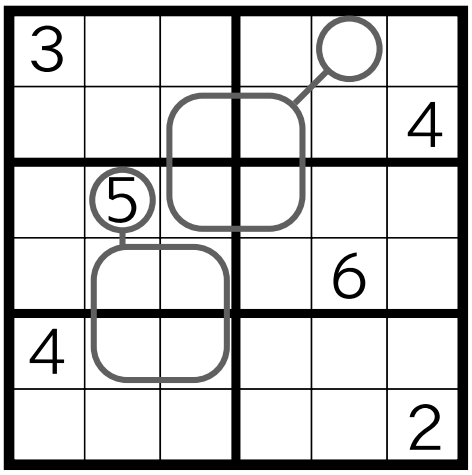
Outer circle and inner sudoku partially overlap. Middle short lines of sudoku may "borrow" the missing 8th/9th numbers from outer circle (extended lines between arrows).





Loupe Sudoku

Follow regular sudoku rules. Additionally, a number in a circle equals to the maximum number of the frame connected to that circle.

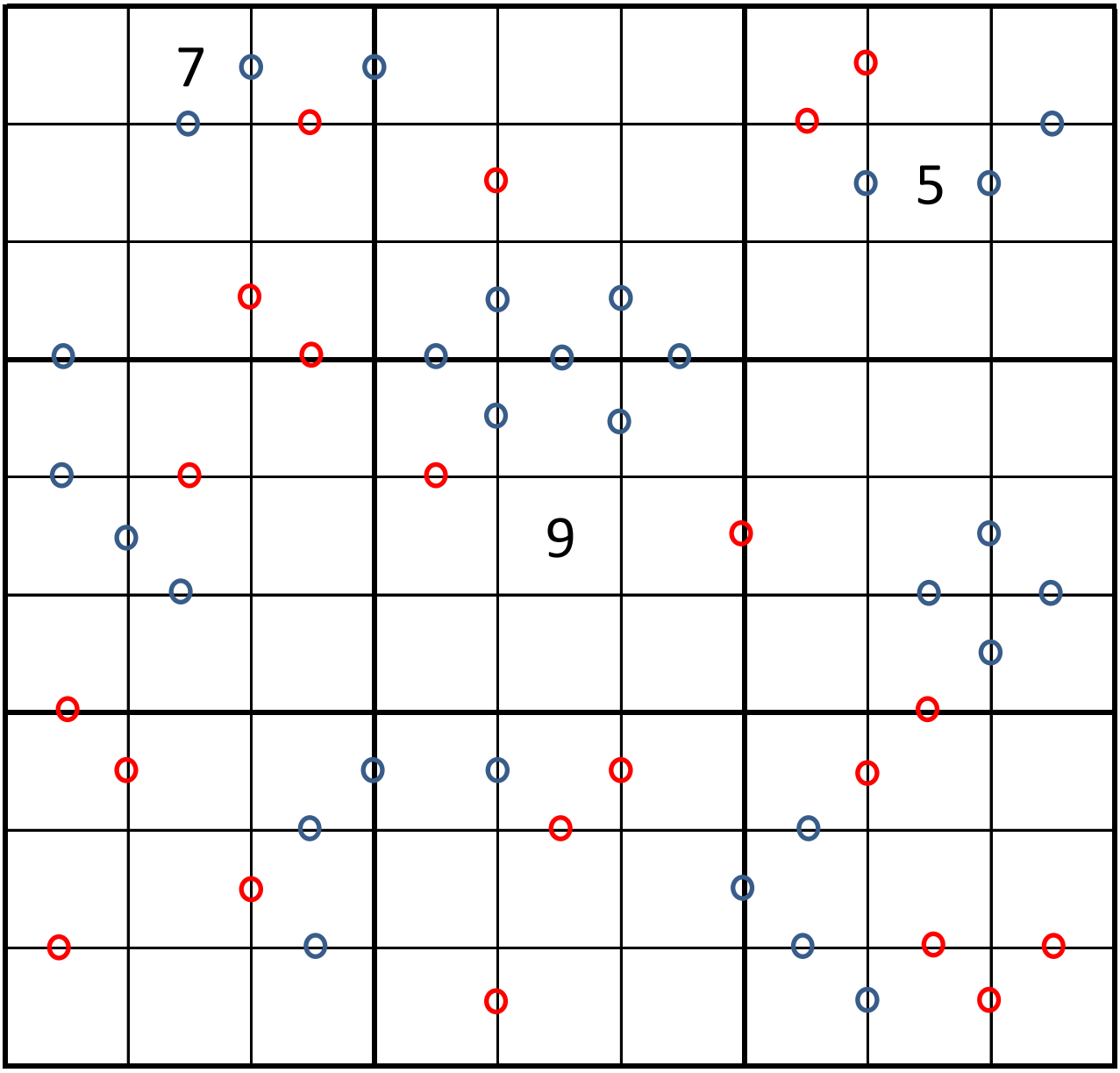


Answer

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

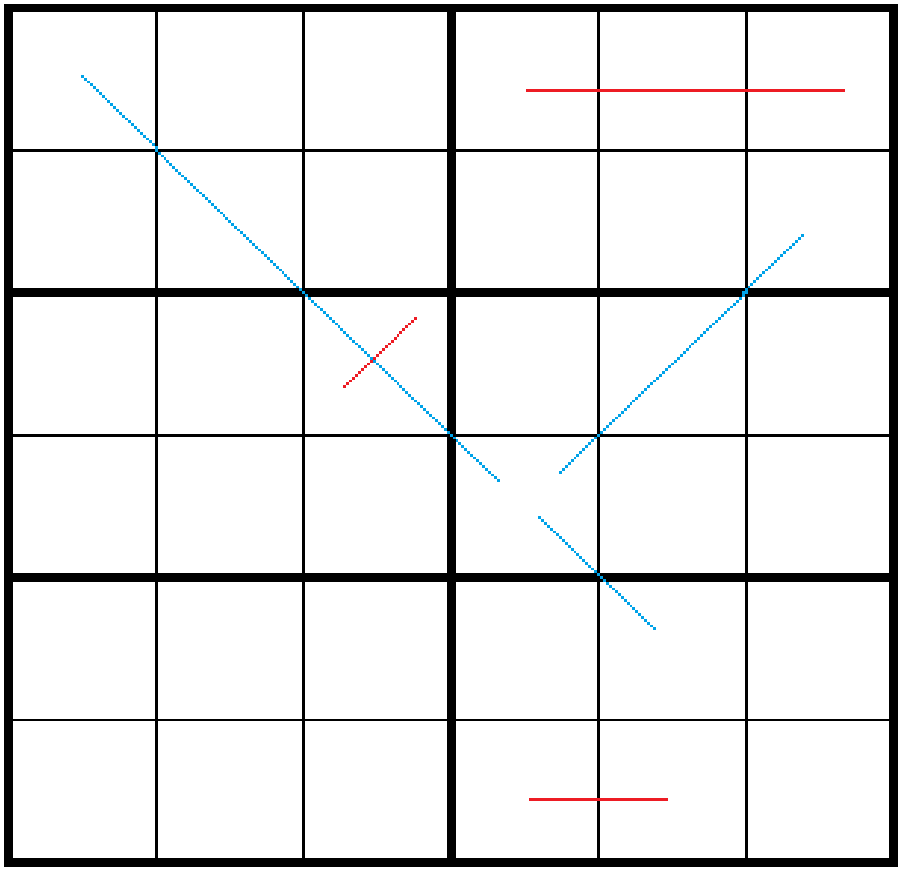
Background(Acknowledgement)
This puzzle is based on Braille Sudoku by Yukari Nishiyama. Braille Sudoku is posted on Japanese puzzle magazine Nanpurefan 2011 Oct only at once. I have never seen that Sudoku anywhere else. Braille Sudoku has similar looking to Roupe Sudoku but 2x2 box represents braille number by the parity of numbers (Odd numbers gives black dot and even white).
First time I saw Braille Sudoku I favored its design. But I think it can be more simple puzzle. So I replaced braille number to maximum selection. This is the background of Roupe Sudoku.
I believe this puzzle has enough originality but I thought I should tell this precedingly.

Puzzle by Takeya Saikachi



Standard rules of sudoku apply.
Blue dot between two adjacent cells show that these two cells contain prime numbers.
Red dot between two adjacent cells show that the value of one cell is the double of the other.

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

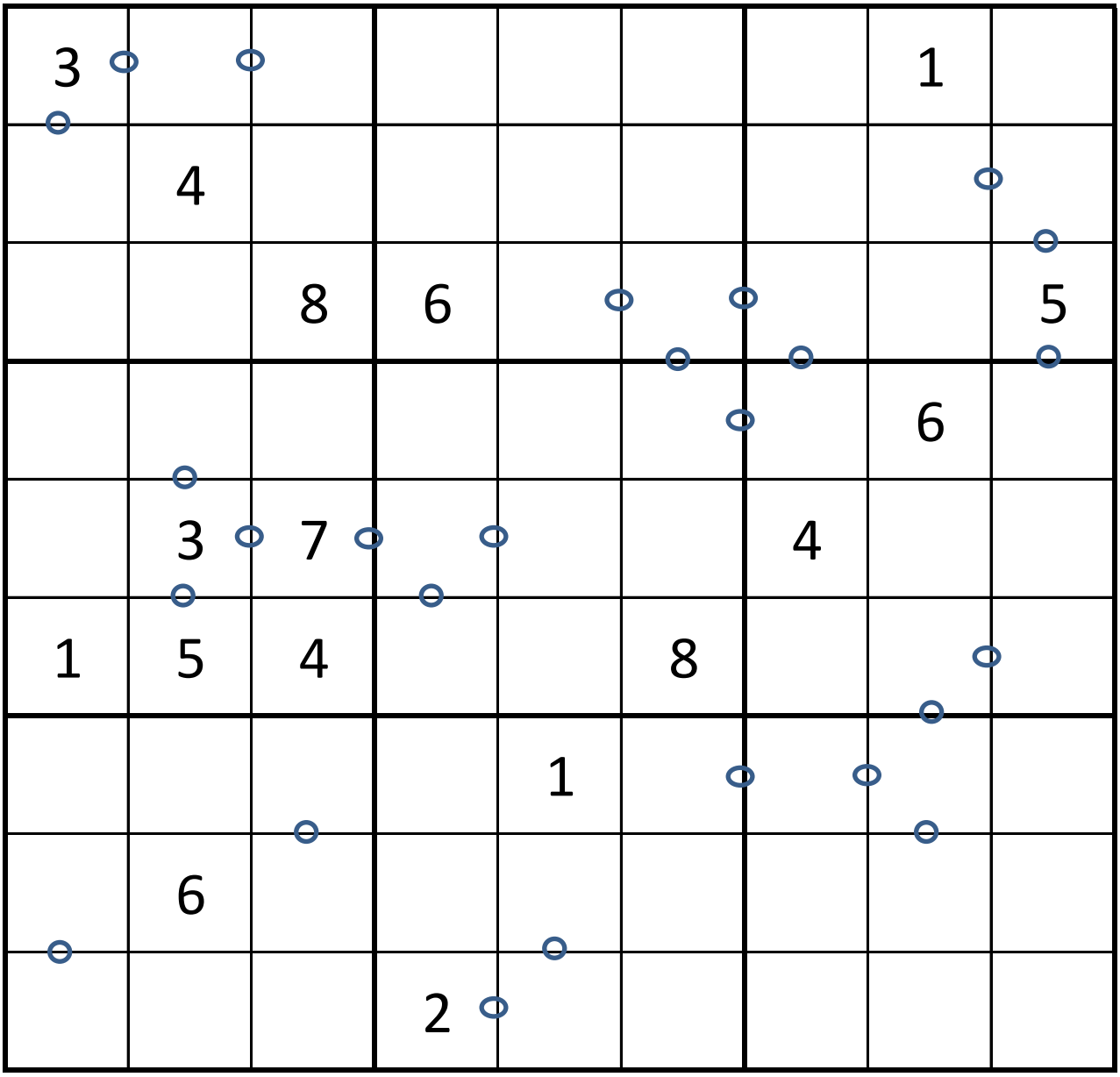


Standard sudoku rules apply.
Additionnally three lines with the same color have a particularity.
The ratio of the big one to the middle one is the same than the midlle one to the small one.
A line of n cells is a n-digits number.
Numbers are read from left to right, then from top to bottom.

In this example, the middle line is a square number and ratios are entires.

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

Submitted by Yannick Meyapin



Classical rules of sudoku apply.
Additionnally if two prime numbers share an edge, a dot is denoted.
1 is not considered as a prime number.

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

	G				E			F	25
		A				C			30
B	D		C	F					30
							F		25
D			B		G			I	32
						A		D	29
	H				A				25
		C				I			34
A	F		I		B			H	31
31	26	27	27	27	38	25	26	34	

Fill the grid with classical rules of sudoku. Additionnally each letter has a value.
Numbers outside the grid shows the sum of these values in each corresponding row or column .
The value of a letter is dobled in a light blue cell and tripled in a dark blue.
As in scrabble, different letters can have the same value.

A	B	C	D	E	F	G	H	I
	2	2				2		

C	G	H	A	B	E	D	I	F	25
F	I	A	G	H	D	C	B	E	30
B	D	E	C	F	I	G	H	A	30
E	C	I	D	A	H	B	F	G	25
D	A	F	B	E	G	H	C	I	32
H	B	G	F	I	C	A	E	D	29
I	H	C	E	G	A	F	D	C	25
G	E	C	H	D	F	I	A	B	34
A	F	D	I	C	B	E	G	H	31
31	26	27	27	27	38	25	26	34	

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

Submitted by Yannick Meyapin

Cross 8 Noughts 4

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

Standard sudoku rules apply. Each 3x3 region is a tic-tac-toe game.
Cross are replaced by odd digits and noughts by even digits.
In these 9 regions 8 times cross win and 4 times noughts win.
It is possible noughts and cross win in the same region.
Noughts or cross can win many times in the same region.

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

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

Classical rules of sudoku apply.
If the value of a cell is the ten of the product of two adjacent cells, this cell is colored.

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

Submitted by Yannick Meyapin

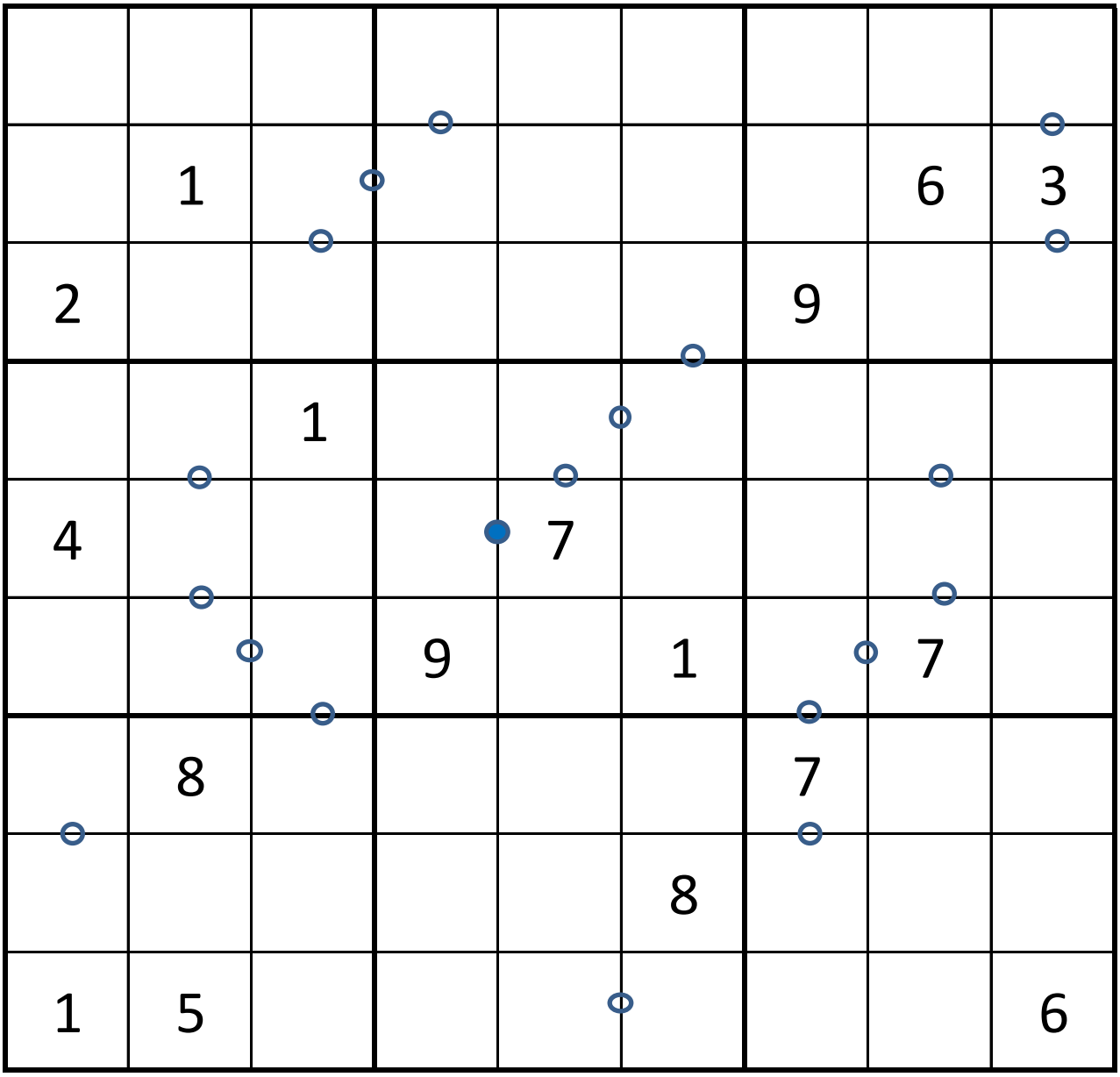
9						8		4
		4					3	
	1							6
4					6			
						2		9
	3			8			7	
6			9			5		
		1			8		9	
2								7

O	X	X
X	X	O
X	X	X

Standard rules of sudoku apply.
Additionnally each 3x3 region is seen as a tic-tac-toe game.
Cross (X) are represented by odd digits and noughts (O) by even digits.
The second grid shows the winner on each corresponding 3x3 region.

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

Submitted by Yannick Meyapin



Classical rules of sudoku apply.
Additionnally if two prime numbers share an edge, a dot is denoted.
If the two prime numbers are twins (their difference is 2), the dot is filled.
1 is not considered as a prime number.

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

AntiUR Sudoku

by Yanzhe Qiu

Brief Rule:Classic Sudoku Rules apply.UR patterns cannot exist.

Detailed Rule:
Expression 1: Classic Sudoku rules apply.There cannot be another Classic solution that has only 4 ungiven cells different(and all givens the same) to your solution.

Expression 2: Classic Sudoku rules apply.In any four cells within two rows,two columns and two boxes, there must be either a given number or at least 3 different values.

Sample Puzzle:

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

Solution:

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