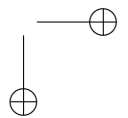
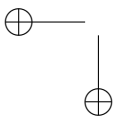


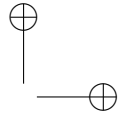
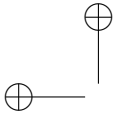
Gnu Sudoku

I

Symmetric sudokus from easy to fiendish

Issue 1





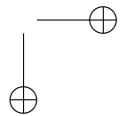
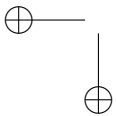
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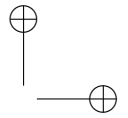
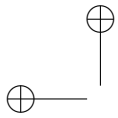
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If you have any feedback, please send an email to sudognu@baaran.de. If you would like to print, sell or translate this book, please contact me and I'm sure we will come to an arrangement.

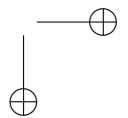
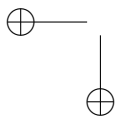
Jens Baaran
Braunschweig, August 2009

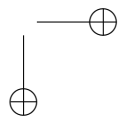
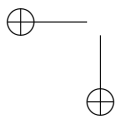
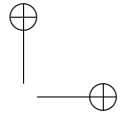
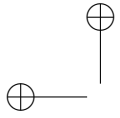




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Introduction to Sudoku

Solving Sudoku

A sudoku puzzle is formed by a grid of nine rows and columns. Slightly thicker lines divide this 9x9 grid into nine 3x3 subgrids called 'blocks' as shown in the figure below. In order to ensure that there is only one solution to a sudoku, some of the cells contain a digit between one and nine. These are the 'givens'. The empty cells are to be filled out by using logic deduction.

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

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

A sudoku puzzle and its solution.

There is only one rule for solving sudoku: **Fill in the empty cells with digits from 1 to 9 in a way, so that each row, each column and each one of the nine 3x3 blocks contains each digit exactly once.**

History of Sudoku

Sudoku puzzles were invented by the architect Howard Garns. They first appeared 1979 in a US puzzle magazine under the name 'Number Place'. However, they gained popularity only about six years later in the far east, when a Japanese magazine began publishing the puzzles regularly. In Japan they became known under the name 'Sudoku' or 'Su Doku'.

Wayne Gould, a retired Hong Kong judge born in New Zealand, was fascinated and developed a computer program to create sudoku puzzles and rate their difficulty. In 2004 he offered his program to the London Times. When the Times started publishing sudokus in November 2004, they quickly became popular all over the western hemisphere.

Sudoku Facts

There are a number of operations to transform a sudoku, while keeping it in a valid state:

1. Permutations of the nine numbers.
2. Exchanging rows and columns (transposing the matrix).
3. Permutations of rows or columns within their single blocks.
4. Permutation of the blocks row- or column-wise.

If two sudokus cannot be transformed into each other with any combination of these rules, they are said to be 'essentially different'.

The smallest number of givens necessary for a sudoku with a unique solution is presumably 17, however, this has not been proven mathematically. At this time more than 47,000 essentially different Sudokus with 17 givens are known. Most of them were found by the Australian mathematician Gordon Royle.

Ed Russell and Frazer Jarvis determined the number of essentially different completely filled out 9x9 sudokus (i.e. sudoku solutions) to be 5,472,730,538. This number is not to be confused with the number of essentially different sudoku puzzles with unique solutions, which is much larger, because each one of the 5,472,730,538 solutions can be turned into many different puzzles.

Easy Sudokus

The sudokus in this chapter are all completely solvable by using the most basic sudoku solution techniques: 'singles' and 'hidden singles'.

For example in the sudoku below there is only one possible candidate for the cell r4c5 (row 4, column 5). The numbers 2, 6, 8 and 9 can be eliminated, because row 4 already contains these. 3, 4 and 7 are present in the fifth column, and 1 drops out, because the middle block already contains this number, which leaves 5 as the single remaining candidate for r4c5.

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

Example: Singles and hidden singles.

There are also some examples for so-called 'hidden singles' in the sudoku above. Usually there is more than one candidate for a particular cell, but sometimes one of the candidates occurs only once in a given block, row, or column. If you look at the rightmost cell in the first row, you will find, that there are five candidates for this cell: 2, 4, 6, 7 and 9. But r1c9 is the only cell in the first row, which can contain the number 6; the candidate 6 is 'hidden' among the other candidates 2, 4, 7, and 9.

Easy Sudokus

There are two more hidden singles: Only one cell within the upper left block can contain a 6 and there is only one cell in the lower right block, which can contain the 7.

Almost all solution steps for the following easy sudokus will offer a choice of two or more cells, which can be solved. So if you overlook a particular cell, which can be solved, you might find another one for filling in the next number. Nevertheless, none of the Sudoku puzzles in this book contains any gratuitous givens, which would not be necessary to provide a unique solution. Also, all of the sudoku puzzles in this book are essentially different. For a definition of the term 'essentially different' see the chapter Introduction'.

Easy Sudokus

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

Sudoku 1

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

Sudoku 2

Easy Sudokus

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

Sudoku 3

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

Sudoku 4

Easy Sudokus

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

Sudoku 5

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

Sudoku 6

Easy Sudokus

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

Sudoku 7

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

Sudoku 8

Easy Sudokus

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

Sudoku 9

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

Sudoku 10

Easy Sudokus

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

Sudoku 11

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

Sudoku 12

Easy Sudokus

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

Sudoku 13

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

Sudoku 14

Easy Sudokus

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

Sudoku 15

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

Sudoku 16

Easy Sudokus

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

Sudoku 17

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

Sudoku 18

Easy Sudokus

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

Sudoku 19

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

Sudoku 20

Moderate Sudokus

Analogous to the single, where there is only *one* candidate for *one* cell, it often helps, when there are exactly *two common* candidates for *two* cells, provided that these two cells are related to each other by being located within the same row, column, or block. Accordingly this technique is called 'double', or sometimes 'naked double', when no other candidates are present in the cells concerned. Similar to the hidden single technique there also is a 'hidden double' technique, where the double is hidden among other candidates.

Consider the sudoku on the following page. The large numbers are the givens plus all singles and hidden singles that have been filled in so far. The small numbers are the candidates remaining for the as yet unsolved cells. You can verify that at this point it is not possible to immediately fill in another number.

Note that the first two rows of column three (the cells r1c3 and r2c3) contain the same two candidates 7 and 8 without any further candidate. Since both cells are also within the same block, the 7 and the 8 can be eliminated from the other cells within this block. While the 8 is not present as a candidate in the other six unsolved cells of the top left block, three candidate sevens can be eliminated from the cells r1c1, r2c1 and r3c1, because the 7 must either be at r1c3 or r2c3. Another double can be found in the first two cells of the fourth column, allowing us to eliminate two candidates in the block associated with these cells and one candidate in the fourth row.

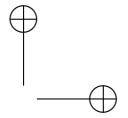
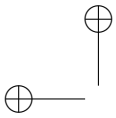
Moderate Sudokus

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

Example: Doubles and hidden doubles.

Now suppose, we wouldn't have found the naked double at r4c1 and r4c2 yet and take a look at the leftmost block in the middle row of blocks. The cells r5c1 and r6c2 are the only cells in this block containing the candidates 1 and 2, however, together with one of the other candidates 5 and 9. Since one of these two cells must contain the 1 and the other one the 2, the 5 and the 9 can be eliminated as candidates from the cells r5c1 and r6c2. This is an example of a hidden double.

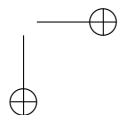
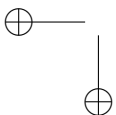
To summarize, the double or naked double technique sometimes allows us to eliminate candidates from cells other than the cells containing the double, while the hidden double technique always reduces the candidates of the hidden double cells themselves, turning the hidden double into a naked double.



Moderate Sudokus

The first ten sudokus in this chapter are still solvable by applying the solution techniques single and hidden single, which were explained in the previous section. But these moderately difficult sudokus will not provide as many opportunities for solving their cells, making them slightly more difficult as the ones in the previous chapter.

For the last few sudokus in this section you will at some point need to eliminate candidates for certain cells using the hidden double or naked double techniques, before you can continue filling in numbers.



Moderate Sudokus

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

Sudoku 21

Moderate Sudokus

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

Sudoku 22

Moderate Sudokus

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

Sudoku 23

Moderate Sudokus

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

Sudoku 24

Moderate Sudokus

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

Sudoku 25

Moderate Sudokus

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

Sudoku 26

Moderate Sudokus

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

Sudoku 27

Moderate Sudokus

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

Sudoku 28

Moderate Sudokus

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

Sudoku 29

Moderate Sudokus

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

Sudoku 30

Moderate Sudokus

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

Sudoku 31

Moderate Sudokus

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

Sudoku 32

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

Sudoku 33

Moderate Sudokus

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

Sudoku 34

Moderate Sudokus

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

Sudoku 35

Moderate Sudokus

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

Sudoku 36

Moderate Sudokus

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

Sudoku 37

Moderate Sudokus

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

Sudoku 38

Moderate Sudokus

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

Sudoku 39

Hard Sudokus

Now you probably have already guessed, that doubles and hidden doubles are not the end of the road, and similar to singles and doubles there are triples, quadruples, quintuples, etc. together with their hidden counterparts, which can help you eliminating candidates on the way to the solution to your sudoku puzzle and which work according to the principle explained above for the example of doubles and hidden doubles.

These techniques can be summarized in the concepts of 'tuples' and 'hidden tuples'. A single can be considered being a '1-tuple', a double being a '2-tuple', a triple a '3-tuple' and so on.

It's interesting to note, that for every *naked n-tuple* there exists an associated *hidden m-tuple*, with the numbers n and m adding up to the number of unsolved cells within the respective row, column or block. This is illustrated by the sudoku on the following page. The leftmost block in the middle row of blocks contains the 2-tuple of candidates 5 and 9 and the hidden 2-tuple of candidates 1 and 2 as explained in the previous chapter. Another example is the leftmost block in the first row of blocks, which contains a hidden 6-tuple of the candidates 1, 3, 4, 5, 6 and 9 together with the naked double of the candidates 7 and 8. The obvious exception of this rule is of course the case of two complementary naked tuples within a row, column or block.

Hard Sudokus

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

Example: Tuples and hidden tuples.

Another basic technique for candidate elimination is called 'line-block interaction'. Consider the rightmost block in the middle row of blocks in the sudoku on the following page. You find the candidate 6 only in the ninth column. This means, that the candidate 6 can be eliminated from the other cells of the ninth column, in this case from the cell r2c9.

Analogous to the line-block interaction technique, where you can eliminate candidates from a row or a column, there is its counterpart, the 'block-line interaction'. This technique allows you to eliminate candidates from a block. In the fourth row of the sudoku on the next page the candidate 6 appears only within the middle block. Therefore the candidate 6 can be eliminated from the two other cells within this block.

Hard Sudokus

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

Example: Line-block interaction and block-line interaction.

Often a candidate elimination with the *line-block interaction* technique can also be interpreted as a *block-line interaction*. This is illustrated by the example for line-block interaction mentioned above. In the seventh column the candidate 6 appears only in the upper right block. This is another justification for eliminating the six from the candidate list of the cell r2c9. Note, however, that the block-line interaction example for elimination of the candidate 6 from r5c5 and r6c5 can not be interpreted as a line-block interaction.

Now you should be prepared for solving the following hard sudokus. You will need candidate elimination techniques as explained above for solving each one of them.

Hard Sudokus

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

Sudoku 40

Hard Sudokus

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

Sudoku 41

Hard Sudokus

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

Sudoku 42

Hard Sudokus

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

Sudoku 43

Hard Sudokus

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

Sudoku 44

Hard Sudokus

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

Sudoku 45

Hard Sudokus

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

Sudoku 46

Hard Sudokus

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

Sudoku 47

Hard Sudokus

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

Sudoku 48

Hard Sudokus

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

Sudoku 49

Hard Sudokus

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

Sudoku 50

Hard Sudokus

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

Sudoku 51

Hard Sudokus

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

Sudoku 52

Hard Sudokus

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

Sudoku 53

Hard Sudokus

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

Sudoku 54

Hard Sudokus

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

Sudoku 55

Hard Sudokus

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

Sudoku 56

Hard Sudokus

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

Sudoku 57

Hard Sudokus

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

Sudoku 58

Hard Sudokus

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

Sudoku 59

Hard Sudokus

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

Sudoku 60

Evil Sudokus

The candidate elimination techniques described in the previous chapters are all confined to a small region within the sudoku. They involve only a small number of cells, which are closely related to each other. Starting with this chapter more complex techniques are introduced, which are somewhat harder to spot.

For talking about these more complex solving techniques it is helpful to first define the concept of 'peers' or 'buddies' of a cell: Two cells are peers or buddies of each other, if they share the same block, row or column. Another way of saying that cell A is a buddy of cell B is to say that cell A 'sees' cell B or vice versa. Each cell of a 9x9 sudoku has 20 peers. None of the peers of a cell can have the same solution as the cell itself.

The solving technique 'XY-wing' involves three cells containing two candidates each. In total, three different candidates are involved, denoted by X, Y and Z. One of the three cells is called the 'pivot' cell. It contains the candidates X and Y and sees the two other cells, the 'pincers'. One of the pincers contains the candidates X and Z, the other one Y and Z. The two pincers do not see each other. Under these circumstances the candidate Z can be eliminated from all cells that see both pincers, because the pivot forces one of them to contain Z.

In the example on the following page there is an XY-wing with the pivot cell at r2c4 and the two pincers at r1c6 and r6c4. The candidates involved are 6 and 9 as X and Y in the pivot cell. The candidate Z to be eliminated is the 3. If the pivot cell turns out to be 6, r6c4 will be 3, otherwise the pivot cell will be 9 and the pincer at r1c6 will be 3. The cell r6c6 sees both pincers, therefore the 3 can be removed from the candidate list of this cell.

Evil Sudokus

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

Example: XY-wing.

Another common solution technique is the 'X-wing'. The X-wing involves four cells located in the intersections of two rows (row A and B) and two columns (column X and Y). If you diagonally connect two pairs of these four cells, an X is formed, hence the name for this technique. If these four cells all have a common candidate and if either *both of the rows* or *both of the columns* involved do *not* contain this common candidate in other cells, the common candidate will be the solution for one of the two diagonal pairs of cells of the X-wing (either rAcX and rBcY or rBcX and rAcY). If for example the common candidate is not present in other cells of the X-wing *rows*, then this candidate can be eliminated in all cells of the X-wing *columns* that do not belong to the X-wing. Analogously, if the common candidate is not present in other cells of the X-wing *columns*,

Evil Sudokus

then this candidate can be eliminated in all cells of the X-wing rows that do not belong to the X-wing.

Consider the example below. The intersection cells of the rows 1 and 9 and columns 1 and 5 all contain the candidate 7. Also, the candidate 7 does not appear in other cells of column 1 and 5. Therefore the 7 can be eliminated from all cells of row 1 and 9, with the exception of the X-wing cells. In this case, only one candidate can be removed (from cell r1c3), but with the help of this technique the rest of the solution becomes very easy. You can verify that none of the previously discussed techniques is applicable to this situation.

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

Example: X-wing.

Finally, there is another, very useful technique you can use, if all else fails: the so-called 'forcing chain'. To start a forcing chain, you choose a

cell, preferably one with only two candidates, and explore, what would follow from picking either one of the candidates for this cell. In this way several possible solution branches develop from the starting cell of the forcing chain. Exploration of single branches and comparison of all branches of a forcing chain gives many chances for advancing the solution of a difficult sudoku. The following list details some of the opportunities for a forcing chain with two branches. It is not recommended, to start a forcing chains from cells with more than two candidates.

- If one of the branches leads to a contradiction (i.e. there is no remaining candidate for one of the cells) the other branch is the solution.
- The two branches sometimes lead to the same solution for a cell.
- If the two branches give different solutions for a cell with more than two candidates, only the two candidates corresponding to the two solutions remain for this cell.
- One of the two branches may quickly lead to the solution of all remaining cells.

Each of the following sudokus contains at least one X-wing or XY-wing. Application of the forcing chain technique is not necessary for any sudoku in this chapter, however, XY-wings and X-wings are hard to spot, so using a forcing chain may occasionally speed up the solution process. Should you prefer to use forcing chains, choose the starting cell for your forcing chain wisely. You will then be able to reduce candidates or solve the next cell after a few steps. Of course you will also need to apply the solving techniques, which were discussed in the previous chapters.

Evil Sudokus

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

Sudoku 61

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

Sudoku 62

Evil Sudokus

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

Sudoku 63

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

Sudoku 64

Evil Sudokus

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

Sudoku 65

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

Sudoku 66

Evil Sudokus

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

Sudoku 67

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

Sudoku 68

Evil Sudokus

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

Sudoku 69

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

Sudoku 70

Evil Sudokus

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

Sudoku 71

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

Sudoku 72

Evil Sudokus

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

Sudoku 73

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

Sudoku 74

Evil Sudokus

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

Sudoku 75

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

Sudoku 76

Evil Sudokus

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

Sudoku 77

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

Sudoku 78

Evil Sudokus

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

Sudoku 79

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

Sudoku 80

Fiendish Sudokus

Just as the concept of doubles can be extended to triples and quadruples (see chapter 'Moderate Sudokus'), the concept of X-wings can also be extended. We recall that an X-wing involved the four intersection cells of two rows and two columns. If the nine intersections of three rows and three columns contain a common candidate, we may have encountered a so-called 'swordfish'. Either *all three rows* or *all three columns* of a swordfish must *not* contain this common candidate in other cells. Then the common candidate will be the solution for three of the nine swordfish cells. Consequently, the common candidate can be eliminated either from the swordfish columns or from the swordfish rows, but not from the swordfish cells themselves. Extending the concept even further to involve four rows and four columns leads to the so-called 'jellyfish'. Only very very few sudokus require the jellyfish technique for their solution.

The sudoku on the following page contains a swordfish for the candidate 5. The three rows number 1, 4 and 7 contain the candidate 5 only in columns 3, 7, and 9. Therefore five candidates can be removed from the swordfish columns, namely from the cells r2c3, r9c3, r6c7, r5c9 and r9c9.

Fiendish Sudokus

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

Example: Swordfish and XYZ-wing.

Not surprisingly, the XY-wing technique discussed in the previous chapter can be extended as well. The new technique is called XYZ-wing and – like the XY-wing – involves three cells and three candidates X, Y, and Z. Again, there is a pivot cell, which sees two pincers, only this time the pivot cell contains all three candidates, X, Y and Z. The pincers have two candidates each: X, Z and Y, Z for pincer A and pincer B, respectively. Now we look at the three possible solutions of the pivot cell:

1. If the pivot is X, pincer A will be Z, therefore cells seeing pincer A can not be Z.
2. If the pivot is Y, pincer B will be Z, therefore cells seeing pincer B can not be Z.

Fiendish Sudokus

3. If the pivot is Z, cells seeing the pivot can not be Z.

If there are any cells, which can see both pincers and *also the pivot*, the candidate Z may be eliminated from them.

So to summarize, the two differences between XY-wing and XYZ-wing are the candidates of the pivot (XY for the XY-wing and XYZ for the XYZ-wing) and the requirement for the cells, where candidate elimination can occur. In the case of an XY-wing these cells need to see only the pincers, the XYZ-wing additionally requires the pivot to be a peer of these cells.

The example sudoku above contains an XYZ-wing with its pivot at r7c3 and two pincers at r4c3 and r8c1. The candidate 8 to be eliminated is found in both pincers and the pivot. Both pincers and the pivot see the cells r3c8 and r3c9, therefore the candidate 8 can be eliminated from them.

The first ones of the following sudokus contain XYZ-wings. Later on there are a few swordfish ones. If you have difficulties spotting these, you can always use forcing chains as a convenient alternative.

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

Sudoku 81

Fiendish Sudokus

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

Sudoku 82

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

Sudoku 83

Fiendish Sudokus

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

Sudoku 84

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

Sudoku 85

Fiendish Sudokus

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

Sudoku 86

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

Sudoku 87

Fiendish Sudokus

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

Sudoku 88

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

Sudoku 89

Fiendish Sudokus

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

Sudoku 90

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

Sudoku 91

Fiendish Sudokus

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

Sudoku 92

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

Sudoku 93

Fiendish Sudokus

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

Sudoku 94

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

Sudoku 95

Fiendish Sudokus

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

Sudoku 96

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

Sudoku 97

Fiendish Sudokus

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

Sudoku 98

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

Sudoku 99

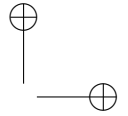
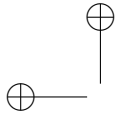
Fiendish Sudokus

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

Sudoku 100

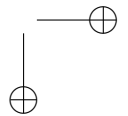
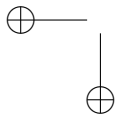
9	6						2	1
		2	5		6	7		
3				9				7
			6		8			
1				4				5
		8	7		4	6		
6	1						5	3

Sudoku 101



Almost unsolvable sudokus

If you have made it this far, you are now an expert in solving even very difficult sudokus. However, some sudokus are so extremely difficult that I don't know how to solve them without the help of a computer. If you can solve one of the following sudokus by hand, I would be very much interested in how you did it and how much time you spent on it.



Almost unsolvable sudokus

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

Sudoku 102

Almost unsolvable sudokus

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

Sudoku 103

Almost unsolvable sudokus

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

Sudoku 104

Solutions

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

Sudoku 1

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

Sudoku 2

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

Sudoku 3

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

Sudoku 4

Solutions

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

Sudoku 5

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

Sudoku 6

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

Sudoku 7

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

Sudoku 8

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

Sudoku 9

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

Sudoku 10

Solutions

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

Sudoku 11

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

Sudoku 12

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

Sudoku 13

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

Sudoku 14

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

Sudoku 15

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

Sudoku 16

Solutions

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

Sudoku 17

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

Sudoku 18

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

Sudoku 19

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

Sudoku 20

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

Sudoku 21

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

Sudoku 22

Solutions

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

Sudoku 23

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

Sudoku 24

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

Sudoku 25

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

Sudoku 26

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

Sudoku 27

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

Sudoku 28

Solutions

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

Sudoku 29

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

Sudoku 30

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

Sudoku 31

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

Sudoku 32

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

Sudoku 33

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

Sudoku 34

Solutions

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

Sudoku 35

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

Sudoku 36

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

Sudoku 37

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

Sudoku 38

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

Sudoku 39

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

Sudoku 40

Solutions

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

Sudoku 41

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

Sudoku 42

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

Sudoku 43

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

Sudoku 44

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

Sudoku 45

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

Sudoku 46

Solutions

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

Sudoku 47

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

Sudoku 48

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

Sudoku 49

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

Sudoku 50

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

Sudoku 51

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

Sudoku 52

Solutions

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

Sudoku 53

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

Sudoku 54

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

Sudoku 55

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

Sudoku 56

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

Sudoku 57

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

Sudoku 58

Solutions

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

Sudoku 59

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

Sudoku 60

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

Sudoku 61

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

Sudoku 62

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

Sudoku 63

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

Sudoku 64

Solutions

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

Sudoku 65

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

Sudoku 66

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

Sudoku 67

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

Sudoku 68

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

Sudoku 69

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

Sudoku 70

Solutions

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

Sudoku 71

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

Sudoku 72

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

Sudoku 73

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

Sudoku 74

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

Sudoku 75

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

Sudoku 76

Solutions

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

Sudoku 77

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

Sudoku 78

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

Sudoku 79

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

Sudoku 80

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

Sudoku 81

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

Sudoku 82

Solutions

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

Sudoku 83

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

Sudoku 84

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

Sudoku 85

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

Sudoku 86

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

Sudoku 87

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

Sudoku 88

Solutions

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

Sudoku 89

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

Sudoku 90

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

Sudoku 91

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

Sudoku 92

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

Sudoku 93

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

Sudoku 94

Solutions

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

Sudoku 95

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

Sudoku 96

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

Sudoku 97

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

Sudoku 98

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

Sudoku 99

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

Sudoku 100

Solutions

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

Sudoku 101

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

Sudoku 102

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

Sudoku 103

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

Sudoku 104