

Additional practice material

After reading the book "Solve every sudoku" the reader will hopefully be able to solve very difficult puzzles. But one will also have to get used to solving puzzles that cannot only be solved with logical steps, and for which the alternative solution method should be used. The follow-up book "Solving Difficult Sudokus" contains super difficult puzzles, up to the most difficult sudoku in the world, with an explanation of how to solve them. The additional practice material presented here includes sudokus which, although they get stuck after applying the logical steps, are not too difficult to solve using the alternative solving method: often, one quickly finds a contradiction, or very quickly one finds a double digit pair (such as "55" or "88"). With these puzzles, the reader can thus gradually increase his skills in solving difficult sudokus. And if all goes well, then it's time to take a look at the puzzles in "Solving difficult sudoku's"! For the real challenges...

In the sequel there's always a puzzle, and on the next page you'll find the solution with a little hint.

PRACTICE PUZZLE 1

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

This is already a very nice puzzle. After using logical steps, one gets stuck when 45 digits still have to be filled in. If you use the number pair "45" in (R2,C2) as a starting point, you will soon see that there is "77" in (R7,C7). And after that the puzzle can be solved immediately, without any problems, see below for the solution.

Some puzzlers also see very quickly that something special is going on in the boxes we made grey. With the information we have we conclude that there must be a 5 in one of the boxes (R7,C3) and (R3,C7) anyway. But if that is the case, then the 5 can be deleted as a possibility in (R7,C7), leaving only a 7. Note that we also get this result with our alternative solution method. Apparently, it is the key to the solution of this sudoku!

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

SOLUTION PRACTICE PUZZLE 1

PRACTICE PUZZLE 2

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

After we get stuck, we can take the number pair "36" in (R8,C8) as a starting point. We then soon notice that both choices lead to a 7 in (R7,C1). This makes the rest of the puzzle easily solvable.

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

SOLUTION PRACTICE PUZZLE 2

PRACTICE PUZZLE 3

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

In this puzzle the logical steps stop when 22 digits still have to be filled in. The nice thing is that there are a lot of number pairs to be found. This is nice, because if we then choose a suitable starting point, we will quickly find a lot of digits. We chose "16" in (R4,C5), this leads to "66" in (R2,C5). And so, we can place a 6 in that cell, then the sudoku is quickly solved.

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

SOLUTION PRACTICE PUZZLE 3

PRACTICE PUZZLE 4

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

Thanks to colleague Marcel Hendrix from Signify, who sent me this puzzle. Apparently, it is/was known as "Waxman's challenge". Note that it is also a puzzle with only 17 digits given. That does not automatically mean that this puzzle is difficult; there are puzzles with 17 digits given which are easy, and very difficult. In Germany Stefan Heine publishes puzzle books in which only sudokus with 17 digits are given.

This one is fairly simple to solve, but we get stuck first when we only must fill in 15 digits. However, those empty boxes all contain a pair of numbers, except one, namely (R6,C8). We also see 3 matching number pairs in the 9th row, choose one to start with. With the alternative solution method, we then come to the conclusion that there must be a 7 in (R6,C9). After that solving it is a piece of cake.

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

SOLUTION PRACTICE PUZZLE 4

PRACTICE PUZZLE 5

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

With this puzzle we get stuck when there are 30 boxes to be filled in. Now choose the number pair in (R7,C8) as a starting point, and you will soon see that the number 8 leads to a contradiction after a few steps. In short, there must be a 7 in (R7,C8) and with that the puzzle is quickly solved again.

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

SOLUTION PRACTICE PUZZLE 5

PRACTICE PUZZLE 6

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

Things seem to be going well for a long time, until we have to fill in 15 more digits. We're stuck! But if we then choose the pair of numbers in (R2,C1), we soon see that the choice 8 leads to a 2 in (R1,C4) and (R2,C6), which are both cells in V5, of course that is not possible, and so we conclude that there should be a 2 in (R2,C1). If we fill that in, then the puzzle is solved quickly.

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

SOLUTION PRACTICE PUZZLE 6

PRACTICE PUZZLE 7

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

Nice puzzle, in which we, as usual, get stuck when a limited number of digits needs to be filled in. If we take "67" (R1,C6) as a basis, we quickly find "44" (R3,C7). With this 4 the puzzle is solved quickly.

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

SOLUTION PRACTICE PUZZLE 7

PRACTICE PUZZLE 8

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

Two empty squares, that doesn't look very promising! But we come a long way, and are stuck when there are still 22 digits to be filled in. If we choose the cell (R5,C7) as starting point, we quickly see that a 2 in that box quickly leads to an 8 in both (R2,C7) and (R8,C7). Of course, that is not possible, so we know that a 5 comes in (R5,C7). Further solving is child's play.

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

SOLUTION PRACTICE PUZZLE 8

PRACTICE PUZZLE 9

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

A key to the solution of this puzzle is to find a matching pair of numbers "26" in (R8,C2) and (R9,C2). Once we get stuck, we take "46" in (R3,C1), with which we quickly find that there is "77" in (R5,C9). So, we fill in a 7, and solve the sudoku without any problems.

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

SOLUTION PRACTICE PUZZLE 9

PRACTICE PUZZLE 10

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

After using logical steps one gets stuck when 45 digits still need to be filled in. If one uses the number pair "65" in (R2,C2) as a starting point, one sees very quickly that "33" results in (R7,C7). And after that, the puzzle is easy to solve.

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

SOLUTION PRACTICE PUZZLE 10