

Sudoku Solver

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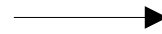
Sudoku

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

Image: <https://en.wikipedia.org/wiki/Sudoku>

Sudoku

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



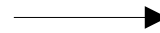
5	3	4	6	7	8	9	1	2
6	7	2	1	9	5	3	4	8
1	9	8	3	4	2	5	6	7
8	5	9	7	6	1	4	2	3
4	2	6	8	5	3	7	9	1
7	1	3	9	2	4	8	5	6
9	6	1	5	3	7	2	8	4
2	8	7	4	1	9	6	3	5
3	4	5	2	8	6	1	7	9

Image: <https://en.wikipedia.org/wiki/Sudoku>

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Sudoku: the Project

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



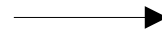
5	3	4	6	7	8	9	1	2
6	7	2	1	9	5	3	4	8
1	9	8	3	4	2	5	6	7
8	5	9	7	6	1	4	2	3
4	2	6	8	5	3	7	9	1
7	1	3	9	2	4	8	5	6
9	6	1	5	3	7	2	8	4
2	8	7	4	1	9	6	3	5
3	4	5	2	8	6	1	7	9

Image: <https://en.wikipedia.org/wiki/Sudoku>

- The problem of solving sudoku's is NP-Complete.
- Can we come up with a fast solver for this problem?
 - Backtracking and search techniques, and heuristics.

Sudoku: the Project

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



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

Image: <https://en.wikipedia.org/wiki/Sudoku>

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- What are some of the combinatorial and mathematical properties of sudoku?
- Comparative study of the different solvers (AI approaches).

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



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

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- Can we come up with a fast solver for this problem?
 - Backtracking and search techniques, and heuristics.
- What are some of the combinatorial and mathematical properties of sudoku?
- Comparative study of the different solvers (AI approaches).
- Can we build a GUI application (web/mobile/desktop) that allows someone to set up and play a sudoku puzzle.
- How do we randomly generate a sudoku puzzle with a unique solutions?

Variants of Sudoku

→ There are many variations of sudoku that can also be investigated.

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

22	27		12	19			5	14
						18		
	5	14					16	
		18				15	19	15
11	10	6						
		13		9		23		
	9		6				9	
18	14		11		22		12	
			13					