Constraint Satisfaction Problems

A SUDOKU SOLVER (100 Points)

Write a Sudoku puzzle solver using a Constraint Satisfaction Problems approach that can calculate the solution for the puzzle below.

Traditional Sudoku is a 9 X 9 puzzle grid made up of nine 3 X 3 regions. Each region, row and column, contains nine cells each. The numbers shown on the board are **given** and cannot be changed.

The object of the puzzle is to place the numbers 1 to 9 in the empty cells so that each row, each column and each 3 X 3 region contains the same number only once.

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

A puzzle that is much harder and can be used to test additional pruning strategies is:

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

SUBMISSION

Python or C++ are the preferred implementation languages. If you are writing in C++, please include a Makefile as well as any other instructions for compilation. For Python, simply provide a plain PY file (no Jupyter notebook).

Your solution may make use of any numerical libraries for pre-processing, fundamental calculations (i.e., linear algebra) and visualization. However, the core portion of your solution must be implemented from scratch.

Submit your solution via Canvas and include a README file that clearly explains its assumptions.