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Sudoku Solver Proposal

Puzzle (unsolved):

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

Solution:

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

Problem statement:

Sudoku Table consists of **9x9 cells**, each cell receiving a single digit between **1 and 9, inclusive**. Sub-tables consisting of **3x3 cells are specifically grouped**, as shown in the picture. To solve it correctly, sudoku table must satisfy seemingly simple criteria:

- On every **row** and **every column** each digit must appear exactly **once.**
- On every **3x3 block** each digit must appear exactly **once.**
  The two criterias must be satisfied together.

Proposed solution:

This problem will be solved using **eight different algorithms**, each ensuring that all Sudoku constraints are satisfied. To ensure a fair comparison, **all algorithms will be tested on the same Sudoku puzzle.** Their performance will be evaluated based on metrics such

as execution time, efficiency, and success rate, with the goal of identifying the **most effective algorithm**.

The used algorithms:

- Depth-First Search (DFS)
- Breadth-First Search (BFS)
- Backtracking
- Forward Checking
- Constraint Propagation
- A* Search
- Hill Climbing
- Simulated Annealing

Team member	Tasks	Tool
Esraa	Genetic Algorithm	Python
Rawda Aboalyazed	BFS Algorithm	Python
Eman	Backtracking Algorithm	Python
Sara	Forward checking Algorithm	Python
Maryam	Constraint propagation + Problem proposal	Python + word
Sama	A* Algorithm	Python
Rana	Hill climbing Algorithm	Python
Rawda Rashed	Simulated annealing	Python