

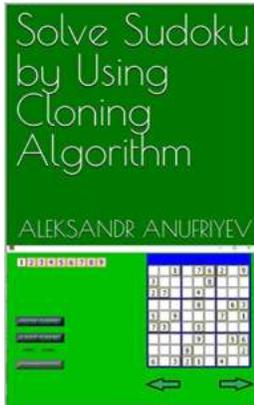
Solve Sudoku By Using Cloning Algorithm

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

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Sudoku is a popular logic-based puzzle that has gained a considerable following in recent years. It involves filling a 9x9 grid with numbers from 1 to 9, so that each column, each row, and each of the nine 3x3 subgrids contains all of the digits only once.

Many methods and algorithms have been developed to solve Sudoku puzzles. One intriguing approach is the use of cloning algorithms. In this article, we will explore how cloning algorithms can be utilized to efficiently solve Sudoku puzzles.



Solve Sudoku by Using Cloning Algorithm

by Aleksandr Anufriyev (Kindle Edition)

★★★★★ 5 out of 5

Language : English
File size : 12978 KB
Text-to-Speech : Enabled
Enhanced typesetting : Enabled
Print length : 54 pages
Lending : Enabled
Screen Reader : Supported



The Cloning Algorithm

The cloning algorithm is a recursive backtracking algorithm that solves Sudoku puzzles by cloning the puzzle grid at each step. It starts by finding an empty cell in the puzzle grid and tries to fill it with a number between 1 and 9. If the number violates the Sudoku rules, it backtracks and tries a different number.

Here is a high-level overview of the cloning algorithm:

1. Find an empty cell in the puzzle grid
2. Try filling the empty cell with a number between 1 and 9
3. If the number violates the Sudoku rules, backtrack to the previous empty cell
4. Repeat steps 2 and 3 until the puzzle is solved

Advantages of the Cloning Algorithm

The cloning algorithm offers several advantages in solving Sudoku puzzles:

- **Efficiency:** The cloning algorithm is highly efficient, especially for puzzles with a large number of empty cells. It avoids unnecessary backtracking by cloning the puzzle grid at each step, making it possible to explore multiple possible solutions simultaneously.
- **Optimality:** The cloning algorithm guarantees an optimal solution if one exists. It exhaustively explores all possible combinations until a solution is found.
- **Flexibility:** The cloning algorithm can be easily tweaked to accommodate different variations of Sudoku puzzles, such as diagonal Sudoku or irregularly shaped grids.

Implementation of the Cloning Algorithm

Now that we understand the basics of the cloning algorithm, let's explore how it can be implemented in code.

Here is a simplified implementation of the cloning algorithm in Python:

```
def solve_sudoku(puzzle):
    if is_complete(puzzle):
        return puzzle

    row, col = find_empty_cell(puzzle)

    for num in range(1, 10):
        if is_valid(puzzle, row, col, num):
            puzzle[row][col] = num

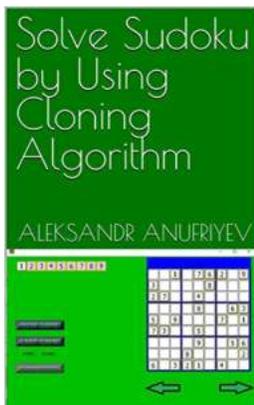
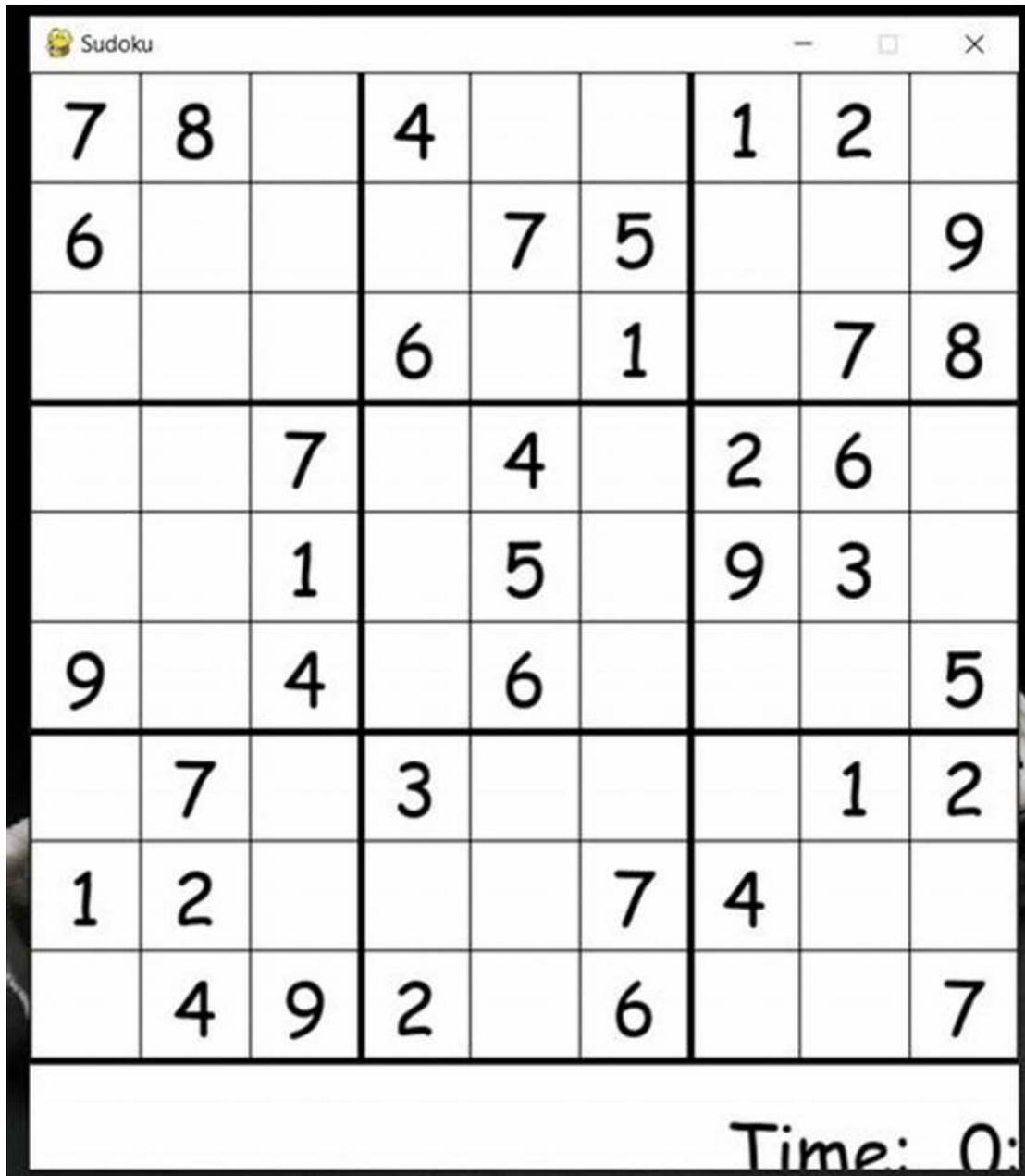
            result = solve_sudoku(puzzle)

            if result is not None:
                return result
```

```
puzzle[row][col] = 0  
return None
```

The cloning algorithm is a powerful tool for solving Sudoku puzzles. Its efficiency, optimality, and flexibility make it a popular choice among Sudoku enthusiasts and puzzle solvers.

By utilizing the cloning algorithm, you can tackle even the most challenging Sudoku puzzles with ease. So go ahead, give it a try, and experience the satisfaction of conquering the Sudoku grid!



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In this book, I will show how to solve complicated sudoku fast and easily.

Go green! By using this program, you will save the papers.

It is also good visualization and organization of problems on working display. Good memory training. More practice will make you solve sudoku super fast. Your brain starts working as a computer.

I will use a cloning algorithm and a PC Windows Program. If you want to read more about this algorithm you can read my book “Sudoku Solving Algorithm”.

Let’s use just “hard” sudoku as an example.

And after you understand how to use algorithms and PC Windows Program, we will

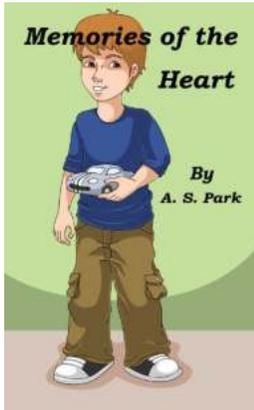
use an 11 stars Sudoku as an example.

You can download this application program here:

<https://snakesxp.itch.io/sudoku-helper>

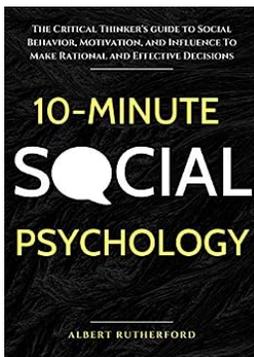
The video is here:

https://youtu.be/cDMDSw2qG_8



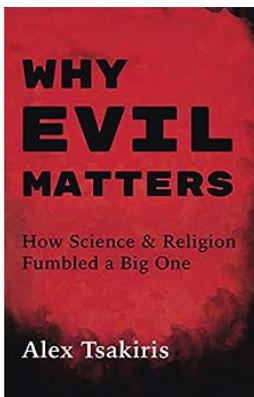
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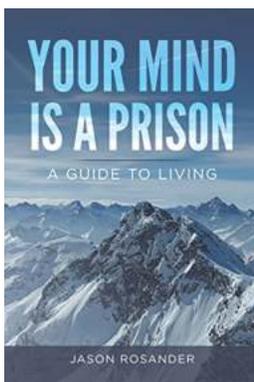
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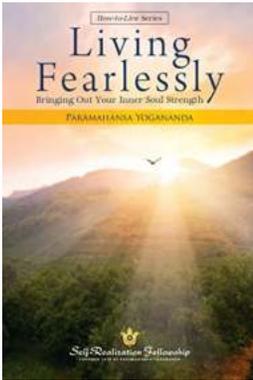
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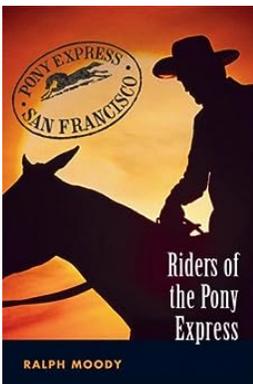
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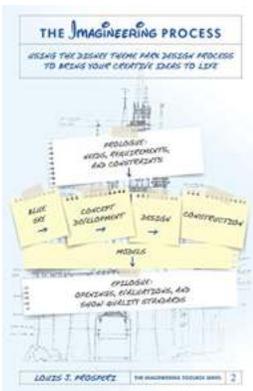
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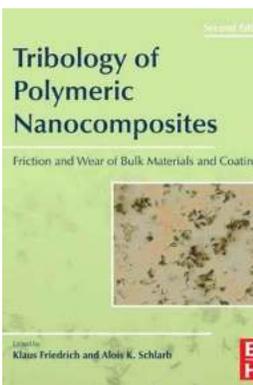
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