Lab Report: sudoku solver Project

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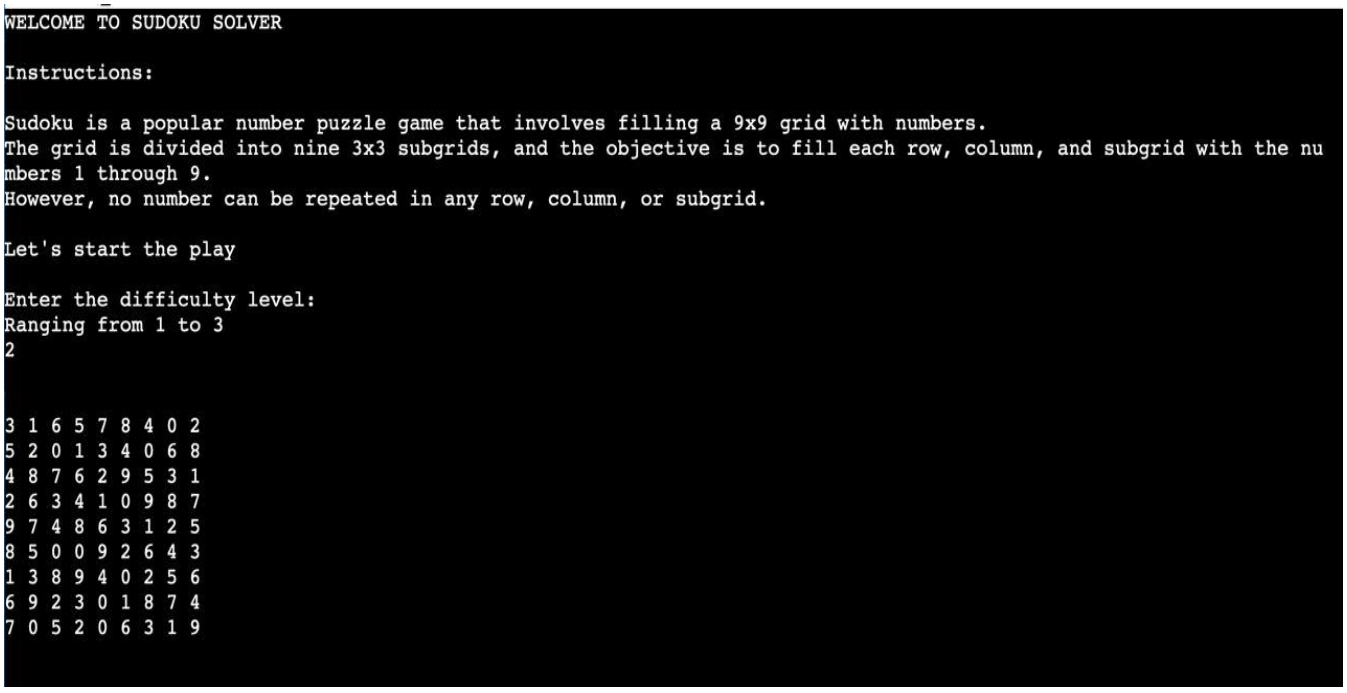
Introduction:

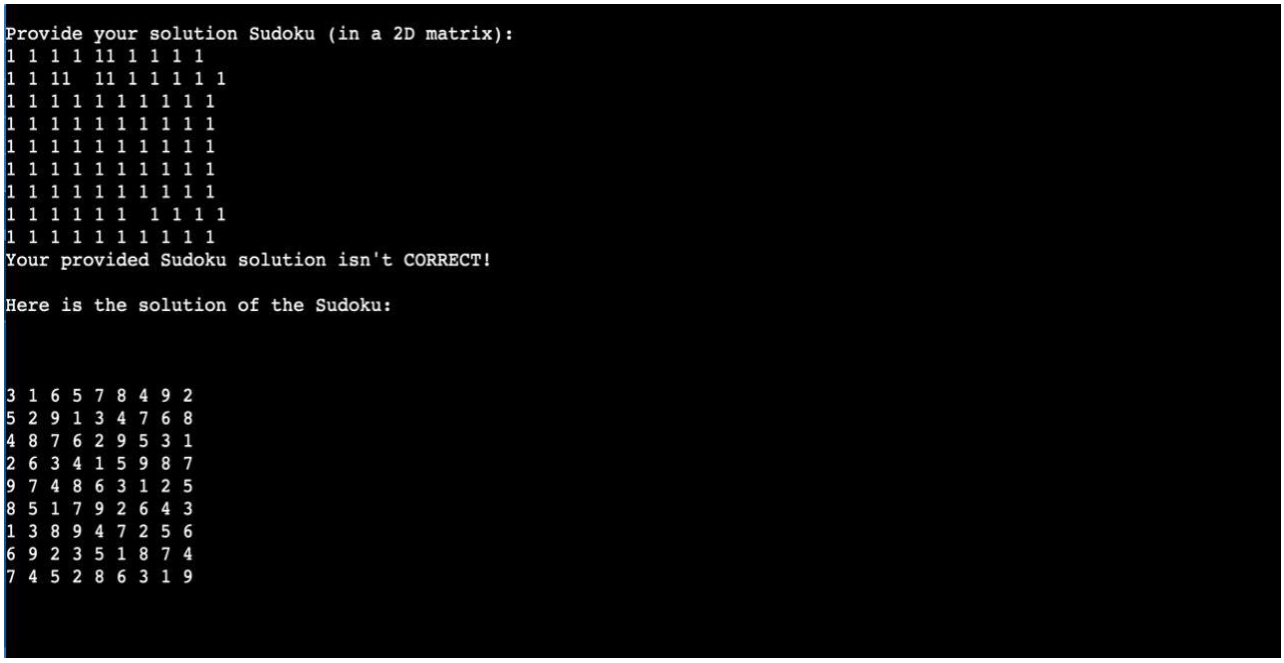
The Sudoku solver project is a console-based application written in C, aimed at providing users with a Sudoku puzzle and allowing them to attempt solving it. The project utilizes a backtracking algorithm to find the solution to the Sudoku puzzle, and it includes user interface for Inputting the solution.

Objectives:

The main objective of this project is to implement a Sudoku solver that uses a recursive backtracking algorithm to find a solution to a given Sudoku puzzle. The project also includes a user interface for interaction, allowing users to input their solution and checking whether it is correct.

User Interface of the game:





Implementation:

The project is implemented in C and consists of several functions for solving and displaying the Sudoku puzzle. The key components of the implementation are as follows:

1.**Sudoku Solver Function (‘solve`)**:

- Implements a recursive backtracking algorithm to solve the Sudoku puzzle.
- Checks for the validity of each number placement in the puzzle using the ‘isSafe’ function.
- Utilizes backtracking to explore different possibilities when a placement leads to an invalid solution.

2.**Safety Checking Function (`isSafe`)**:

- Checks whether a given number placement in a particular row, column,or 3*3 grid.
- Ensures that no number is repeated in the same row,column,or subgrid

3**. User Interface(‘main’ function):**

- Prompts the user to select a difficulty level (1 to 3) for the Sudoku puzzle.
- Provides predefined Sudoku puzzles based on the selected difficulty Level.
- Allows the user to input their solution for the puzzle.
- Compares the user’s solution with the solved Sudoku to determine correctness.

4. **Print Function (`print’)**:

• Prints the Sudoku puzzle to the console for the user to view.

Usage:

1.Compile the C program using a C compiler, such as GCC.

2.Run the compiled executable.

3. Follow the on-screen instructions to select the difficulty level and input your solution.

Results:

The Sudoku Solver successfully solves the Sudoku puzzle using a backtracking algorithm. The user interface allows users to interact with the program, providing a solution to the puzzle. The program then evaluates the correctness of the user's solution and provides feedback.

Conclusion:

The Sudoku Solver project, demonstrates the implementation of a backtracking algorithm to solve Sudoku puzzles. The program provides a user-friendly interface and allows users to engage with the Sudoku-solving process. The project is a practical application of algorithms and serves as an educational tool for individuals interested in Sudoku and algorithmic problem-solving.