OOAD Mini Project
Team - 1
Section: E

Project Title: Sudoku Game

Team Members:

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About the project:

Sudoku is a logic-based game which consists of a **9 × 9 grid** with numbers appearing in some of the squares.
The object of the puzzle is to fill the remaining squares, using all the numbers 1–9 exactly once in each row, column, and the nine 3 × 3 subgrids.

Features of the app:

- Initializing the game and creating a **9 × 9** board with a few existing values.

- Class implementation for the logic of the game itself:

Here we need to use the logic of recursive backtracking in a 9x9 board which is very similar to the n-queens problem in data structures and algorithms.
This logic involves identifying all possible combinations of placement of a given number on the board and a total of 3x9! Combinations and optimizing this time complexity which is an o(n^n) to an order of o(n^2) using **memoization and serialization** concepts.

- Reset Button: Used to recreate the board
- Timer which is started when the game begins
- Dialog box pop-up on the event of a win or error.

Extended Scope:

- Generating different complexities of levels of the game: Easy, Medium, Hard

- "HelpMe" Button:
  Runs the algorithm of the game to check whether the entered input is correct, while increasing a few seconds on the timer. If the input entered is incorrect, then the wrong input numbers are highlighted.

Current Work Breakdown:

Nivedhitaa: Core JAVA implementation of logic of the game (Recursive backtracking)
Riya: Front end/UI using Swing
Nithin: Edge-case and button semantics along with assist in UI and logic