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Import tkinter as tk
From tkinter import messagebox
Import random

# Sudoku puzzle generator using backtracking algorithm
Def generate_sudoku():
  Def is_valid(board, row, col, num):
    For i in range(9):
      If board[row][i] == num or board[i][col] == num:
        Return False
    Start_row, start_col = 3 * (row // 3), 3 * (col // 3)
    For i in range(3):
      For j in range(3):
        If board[start_row + i][start_col + j] == num:
          Return False
    Return True

  Def solve(board):
    For row in range(9):
      For col in range(9):
        If board[row][col] == 0:
          For num in range(1, 10):
            If is_valid(board, row, col, num):
              Board[row][col] = num
              If solve(board):
                Return True
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                    Board[row][col] = 0
                Return False
        Return True

    # Generate a full solved Sudoku board
    Board = [[0 for _ in range(9)] for _ in range(9)]
    Solve(board)

    # Remove numbers to create a puzzle
    For _ in range(random.randint(35, 50)):  # Number of cells to remove
        Row, col = random.randint(0, 8), random.randint(0, 8)
        Board[row][col] = 0

    Return board

# Create a GUI for the Sudoku game
Class SudokuGame:
    Def _init_(self, root):
        Self.root = root
        Self.root.title(“Sudoku Game”)

        Self.board = generate_sudoku()
        Self.entries = [[None for _ in range(9)] for _ in range(9)]

        Self.create_grid()
        Self.create_buttons()
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  Def create_grid(self):
    For row in range(9):
      For col in range(9):
        Entry = tk.Entry(self.root, width=5, font=('Arial', 18), justify='center')
        Entry.grid(row=row, column=col, padx=5, pady=5)
        Self.entries[row][col] = entry
        If self.board[row][col] != 0:
          Entry.insert(tk.END, str(self.board[row][col]))
          Entry.config(state="disabled")  # Disable pre-filled cells

  Def create_buttons(self):
    Check_button = tk.Button(self.root, text="Check Solution", font=('Arial', 14),
Command=self.check_solution)
    Check_button.grid(row=9, column=0, columnspan=9)

  Def check_solution(self):
    For row in range(9):
      For col in range(9):
        User_input = self.entries[row][col].get()
        If user_input:
          If not user_input.isdigit() or int(user_input) != self.board[row][col]:
            Messagebox.showinfo("Incorrect", f"Wrong value at row {row+1}, column
{col+1}")
            Return
    Messagebox.showinfo("Correct", "Congratulations! Your solution is correct!")
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# Initialize the Tkinter window
Root = tk.Tk()
Game = SudokuGame(root)
Root.mainloop()
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