Intelligence Competition by Sudoku Game with Java Software (ICSGJS)

Abdulmonem I. Shennat

Abstract—This paper aims to match the fun and simplicity of the game of Sudoku Game at the same time as adding some new features. It will include a timer clock, with a single player feature that will calculate their time and recode it in SQLITE data base with the full name of the player, thus setting up a challenge to human players. It then allows the next player to start a new game and repeats the same process until the last player, at which point the time spent by each player can be calculated and the competition draws to an exciting close. This paper explores a new design in the traditional Sudoku Game to make it more interesting and challenging. The simplicity of this game makes it an ideal candidate for a minor project as we can focus on advanced topics like Intelligence Competition Functionality and Sudoku Game with Java Software (ICFSGJS).

Index Terms—Intelligence competition, multiplayer game, package of main classes, unique feature.

I. INTRODUCTION

A. Background Information on Sudoku

There have been various puzzles throughout history that were Sudoku-like, the creator of the modern version has been credited to Howard Garns, an architect from Indianapolis. He created them for Dell Magazine in 1979 and called them “Number Place.” Eventually, these puzzles made their way to a Japanese magazine in 1984. The magazine renamed these puzzles as Sudoku, which meant “single numbers”. It didn’t take long for Sudoku to become popular in Japan. But it was only when a British newspaper called “The Times” decided to publish the puzzle in 2004 that Sudoku became a worldwide phenomenon. Today, Sudoku puzzles are published in dozens of magazines in over 35 countries. There are also numerous books and computer games dedicated to this puzzle [1].

B. Traditional Sudoku Game

The Sudoku game is a logic-based, number-placement puzzle that is a special form of Latin Squares. It is most often a puzzle played on a 9×9 grid that can only contain numbers. “Fig. 1,” shows a typical Sudoku puzzle. The player is normally required to fill each cell of the board with numbers one to nine, following specified rules. The rules are normally that each number cannot appear more than once on a row, on a column, and on a block. A block is normally defined as a 3×3 subset of the board, and there are nine blocks in the entire

grid. “Fig. 2,” shows the same puzzle in “Fig. 1” with solution numbers marked in red. Although this form is the most popular version of Sudoku, there are many other variations, ranging from a standard Sudoku grid but with additional rules to unusual board arrangements like jigsaws and geometric shapes other than squares [2].

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

Fig. 1. A typical Sudoku puzzle.

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

Fig. 2. The same puzzle in Fig. 1 with solution numbers marked in red.

C. Project Background

Intelligence Competition by Sudoku Game with Java Software (ICSGJS). It is a remake of traditional Sudoku game by java software and recode it in data base for each player with calculated time by the administrator or computer.

This project aims to bring the fun and simplicity of Sudoku game with some new feature. It will include timer clock whose aim will be to challenge the human players. It will also have the multiplayer feature that will allow more than one players to play the game over a network in the same competition. The traditional Sudoku game does not offer much challenge to it's players. Hence players loose interest in the game after playing it for sometime. Offering some sort of challenge and adventure to the players will help increase the addictive power of this game. The multiplayer with timer clock features of this game will make this game more challenging and interesting. The simplicity of this game makes it an ideal candidate for a minor project as we can focus on advanced topics like Intelligence Competition Functionality and Sudoku Game with Java Software (ICFSGJS) [1], [3].

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The strong support for networked application in Java programming language with data base and availability of high speed network connection layer in present day computers will allow us to build a very efficient multiplayer version of Sudoku game [1].

II. PROBLEM STATEMENT

The traditional Sudoku game does not offer much challenge to it's players. It is impossible to bring out the best playing skill of a players unless a challenge is offered to them. The players loose interest in the game after playing it for sometime due to lack of challenge. Hence when people hear about Sudoku game, they quickly form an image of old age arcade game [1], [2].

III. OBJECTIVES

This game aims to change the way people think of traditional Sudoku game. It will offer the experience of commercial multiplayer games to the player retaining the simplicity of traditional Sudoku game. The major objectives of this project are:

- 1) Create a Sudoku game that will have all the functionality of traditional Sudoku games.
- 2) Introduce multiplayer functionality in the game that will allow several players to play a game one by one in the same match. It should give the experience of real time games to the players.
- 3) Introduce a new Sudoku (unique feature of this game) to make the game more challenging and interesting. The movement and action of this a new game will be controlled by computer whose aim will be to calculate the total time for each player in one match [3].

IV. PROPOSED SYSTEM

The proposed system explains the traditional Sudoku game with new features to make this game more interesting with multiplayer game by analysis and design the system. Then, calculating the spent time for each player as a result.

A. System's Algorithm

"Fig. 3," shows the flow chart of the processes of this new game as an algorithm of this system (ICSGJS) that it explains us how a new competition and challenge between players one by one are done [4].

B. System's Analysis and Design

To analysis this system we needed to know the system activities that they represent use cases. So, a use case is an activity the system carries out, usually in response to a request by a user of the system. It is a situation in which the system must accomplish some goal of a user and documented in a use case diagram. "Fig. 4," shows use case diagram with five use cases and two users or actors. In this instance, both actors the player and administrator are allowed to access the system directly. As indicated by relationship lines, each actor can use every use case that is related them. In addition to one use case from five use cases "stop the game" is accessed for

both the player and administrator [5].

Fig. 3. Flow chart of processes of (ICSGJS) system.

Fig. 4. Use case diagram of (ICSGJS) system.

To design this system we used Java program with SQLITE database to get the results. In firefox we could get extension

SQLITE manager so there we could create database and tables. Here is a package of main classes that were imported. This package is shown below as a sample program of (ICSGJS) system [6], [7].

For applications of this system:

```
import java.awt.*;
import java.awt.event.*;
import java.sql.Connection;
import java.sql.Date;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.text.DateFormat;
import java.text.SimpleDateFormat;
import javax.swing.*;
import java.util.Random;
import java.util.TimeZone;
```

For the results of this system:

```
import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.sql.SQLException;
import java.util.logging.Level;
import java.util.logging.Logger;
import javax.swing.JOptionPane;
import net.proteanit.sql.DbUtils;
```

“Fig. 5,” shows photo of the main window is designed with all functions that are used by the player and computer/administrator of this system for a new kind of Sudoku game according to the main classes of Java program above.

Fig. 5. The main window of (ICSGJS) system.

C. System's Results

In addition to the main window that is shown in “Fig. 5” the computer starts calculating the spent time and recode full name for each player plays this game. The computer records all names of players with their spent time by seconds one by one in SQLITE database. After that, It shows their results by the table as shown in Table I below. And then, It will be easy to know which player wins and more intelligent than others

by the least time is spent to solve the Sudoku puzzle [8], [9].

TABLE I: ALL PLAYERS WITH THEIR SPENT TIME

Name of the player	The spent time by seconds
First player	1800 sec
Second player	600 sec
Third player	1500 sec
Until The last player	900 sec

V. CONCLUSION

Using engineering design principles and practice an applications of Java language with SQLITE database of Sudoku will be created. The design will be flexible allowing users to choose an appropriate grid size based on time constraints and desired challenge. As well the design will pay close attention to memory usage and try to keep it to a minimum. So, the prototype versions will be created with the final version to be completed and in the future we can focus on advanced topics like Intelligence Competition Functionality and Sudoku Game with Java Software (ICFSGJS) that they make this game more interesting for study and play.

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