Project Title: Sudoku Solvers

Team Members:

- Michael Richards - mrichards2021@my.fit.edu
- Jaden Krekow - jkrekow2021@my.fit.edu
- Alice Luce - pluce2021@my.fit.edu
- Adrian Rodriguez - adrianrodrig2019@my.fit.edu

Faculty Advisor: Raghuveer Mohan - rmohan@fit.edu

Client: Not Applicable

Progress Matrix:

Task	Completion %	Michael	Jaden	Alice	Adrian	To do
Research efficient solving strategies and unique game generation for Sudoku	100%			100%		Continue reading additional literature and exploring more options
Compare and select GUI libraries within python, collaboration tools for code and work documents	100%	100%				Find libraries and tools applicable for a website version
Requirement Document	100%				100%	Continue updating and maintaining requirements that align with software goal
Design Document	100%		100%			Update Design Document with

						any future changes decided
Test Plan	0%	0%	0%	0%	0%	Make testing plan and strategy

1. Discussion of each accomplished task for the current Milestone:
   - Task 1: Several fast and efficient algorithms have been found and studied. More sources have been found and will be studied during the next milestone along with the data structures. Knuth's Dancing Links algorithm is currently the most promising. It requires a different data structure than other algorithms, however, and that must be taken into consideration for both time to run and time to implement. Board generation with DLX will not be much more complicated to implement, but it will not be as optimal as other algorithms that will be researched next milestone.
   - Task 2: After researching potential libraries to be used for our GUI, the QT toolkit for Python is what we will be using for the first prototype of our GUI. This toolkit is used in libraries like PySide6 and PyQt5, however we will be using PyQt5 as it is more familiar to our team and comparable in capability to PySide6. We will not be using libraries designed for game development such as PyGame as unlike a traditional game that has a wide range of graphics objects, collision physics, lighting effects, etc. sudoku is much simpler and does not require a library that can handle those systems. A GUI library that is able to display the amount of buttons needed to play sudoku is the minimum requirement from a potential library, and after testing, PyQt5 will be more than able to handle this requirement and other GUI requirements. Other tools we will be using will be github for version control of our project, Confluence for documentation of our application and its algorithms, and Jira for workload management and bug fixing.
   - Task 3: The requirement document creates a foundation for us to begin developing software by laying out tools, algorithms, and expectations that need to be met. This is done by laying the groundwork in a detailed and simplistic manner so stakeholders, users, and developers will understand what needs to be done. Aside from proper documentation for all parties involved it further benefits the team by allowing us to develop by prioritizing important tasks and how we plan to go about implementing those tasks in a timely manner.
   - Task 4: The Design Document organizes discussions we have related to tools and approach to creating the Sudoku Game in a manner easily referenceable. The document outlines the plan for the organization of the GUI and database, and high abstract approaches for the Puzzle

Generation, Puzzle Solver, and Hint System. This document will be useful to ensure that separate delegated parts of the program within the group match in architecture.

2. Discussion (at least a few sentences, ie a paragraph) of contribution of each team member to the current Milestone:

- Alice Luce: I did all of the research so far and I have a small reading list of additional sources ahead of me. I have taken thorough paper notes on algorithms and prepared my research for presentation to the rest of the group and the class as a whole.

- Adrian Rodriguez: I created the Research document which includes both functional, non-functional, and other specific requirements. I did some research for security we may plan to use to provide relief and protection for users using an downloadable application. I researched how much time we need to perform functions and application uptime. By gathering all the information we have acquired and putting it into one detailed document we can easily navigate and use the document as a central point moving forward.

- Jaden Krekow: I created the Design Document which includes a graphic for planned setup of the GUI. Within this document I also created a structure to implement for data within our database, and a basic outline to our approach to various parts of the program such as the puzzle generation, puzzle solver, and hint system.

- Michael Richards: I researched and made test programs of possible Python libraries we can use as a GUI for our sudoku game. Alongside that I also researched and found useful collaboration tools for our project to manage workload amongst our group, version control of our project, and for documentation.

Plan for the next Milestone:

Task	Alice	Adrian	Jaden	Michael
Determine data structure to store Sudoku game board	Research and demos of possible structures	Solidify security measures and possible storage options		
Make GUI Interface with blank Sudoku game board that can be edited			Create MySQL database for program	Create GUI in PyQt

Implement, test, and demo a base Sudoku game	Provide a simple and effective board generation algorithm			

3. Discussion (at least a few sentences, ie a paragraph) of each planned task for the next Milestone or
   - Task 1: Some of the most powerful algorithms require very specific data structures. One of the biggest challenges will be finding a way to unify the structures or run the game quickly with any of them
   - Task 2: A basic version of the GUI will be created for the Sudoku game that will be primarily functionality focused rather than aesthetic focused to allow other group members to begin separate parts of the project. This GUI will include a Sudoku board that can be edited to add/delete numbers from the board.
   - Task 3: A simple board generation algorithm will be tested and implemented into the GUI for a demo. This initial algorithm will not adhere to our final standard of generating a board within 3 seconds for the user.
4. Date of meeting with Client during the current milestone:
   - N/A
5. Client feedback on the current milestone
   - see Faculty Advisor Feedback below
6. Date(s) of meeting(s) with Faculty Advisor during the current milestone:
   - 09/25/2024
7. Faculty Advisor feedback on each task for the current Milestone
   - Task 1: More research and reading needs to be done. A higher variety of algorithms should be available to use.
   - Task 2: More emphasis on the educational features for Sudoku
   - Task 3: Make a web application implementation of the Sudoku game.
   - Task 4: None
8. Faculty Advisor Signature: _____ Date: _____

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Evaluation by Faculty Advisor

Faculty Advisor: detach and return this page to Dr. Chan (HC 209) or email the scores to pkc@cs.fit.edu

Score (0-10) for each member: circle a score (or circle two adjacent scores for .25 or write down a real number between 0 and 10)

Alice Luce	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Jane Doe	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Mark Jones	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Adrian Rodriguez	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10

Faculty Advisor Signature: Signed by: *Raghuveer Mohan* 1DD81E20BD2E446... Date: 9/30/2024