Team FlaskChained
SoftDev1 pd<1>
P2 -- The End
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INITIAL DESIGN DOCUMENT

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Project Sudocool

PROGRAM OVERVIEW:

The classic logic game, Sudoku, in a portable website built with JavaScript. The puzzles are automatically generated in accordance with difficulty settings: easy, medium, hard, killer. Users can create an account to save finished puzzles and times or can play without an account. A set of weekly leaderboards is displayed on the page, ranking the users by the amount of time it took for them to finish the puzzle, differentiated by the difficulty setting. If the user is stuck, they can request hints, with a certain penalty being added to their time setting.

PROGRAM COMPONENTS:

1. **Sudoku Solver**

Some of the simpler puzzles can be solved in negligible time, but solving the killer puzzles may be costly to the efficiency and enjoyability of the site. We may need to rehash the algorithm discussed in Mr. Brooks' AI course to make it more efficient or rewrite a solver entirely. We could build a database of the puzzles and their solutions upon generating each one, and then have the site call on the DB for the puzzle if a user requests one.

2. **Puzzle Generator**

Generating unique puzzles involves a pseudorandom number generator that creates solvable, but also difficult, puzzles. Difficult puzzles will need to have other characteristics aside from simply giving the user fewer numbers, otherwise, it would be a frustrating experience and wouldn't test their skills. One way to test how hard a puzzle is to run it with the solver, and see how many times the solver backtracks while working on the puzzle. The more backtracks there are, the harder the puzzle is.

3. **Front-end**

We anticipate that the hardest part of this project will be to make a front-end interface that allows users to interact with the sudoku puzzles. The number input area would need to be conducive to the sudoku experience, i.e. allowing the user to fill a box with all possible numbers that are legal and removing them as they find other ideas. A website that only uses basic HTML forms would be arduous and would be infuriating to the user. So, we expect a great deal of JavaScript to be involved with our project. Besides that, our FEF is going to be Bootstrap, as that is the framework most of our group is familiar with.

4. **Areas of Expansion**

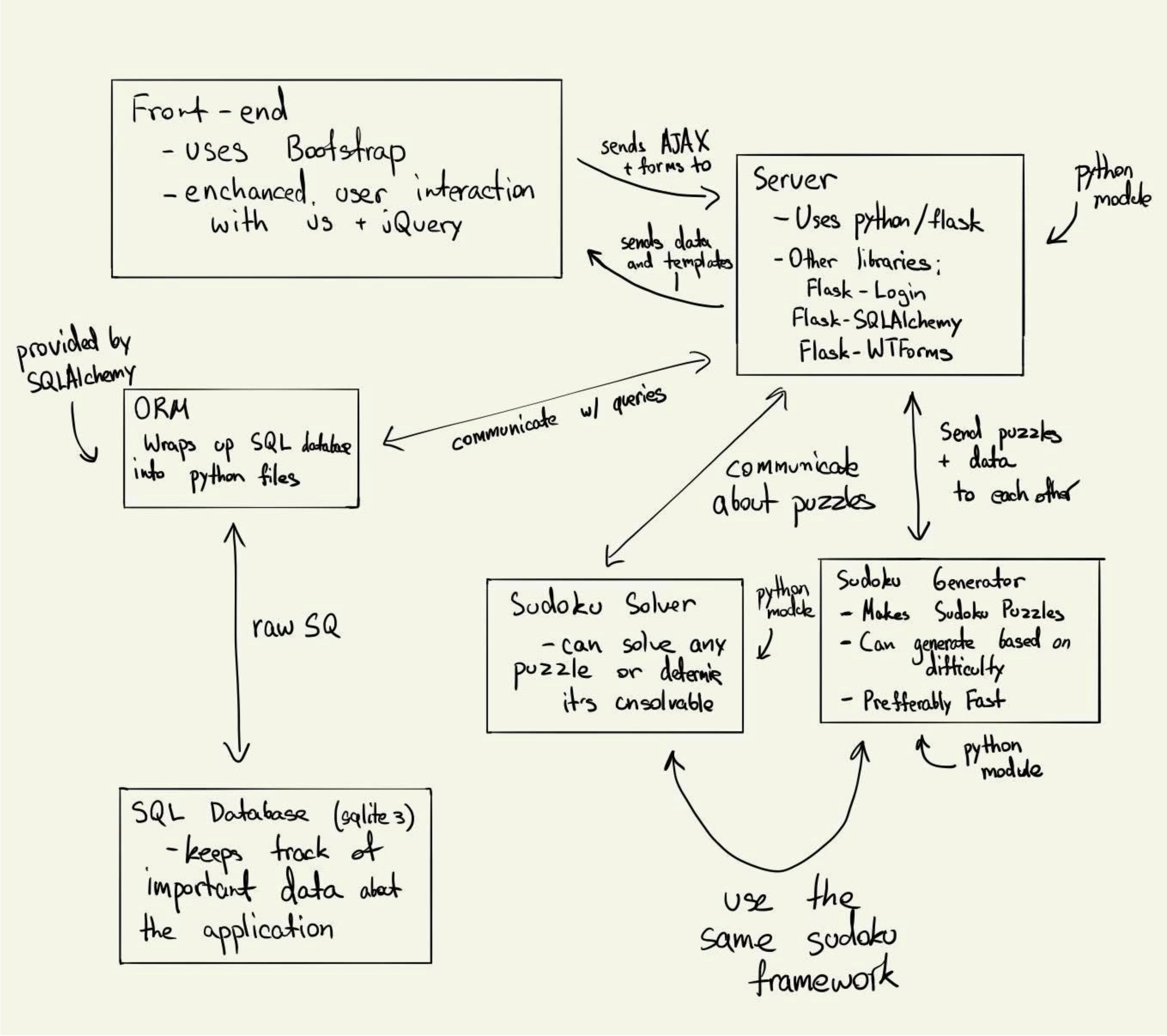
Besides the effective user interface for solving puzzles, the MVP for this project is fairly low. For this reason, we propose the following areas of expansion, assuming we finish our MVP early:

1. Some kind of way to save puzzles while working on them
2. Allow users to create their own puzzles (and make sure they're solvable)
3. PDF Puzzle Export
4. More types of puzzles (ex. Symmetric Sudoku)

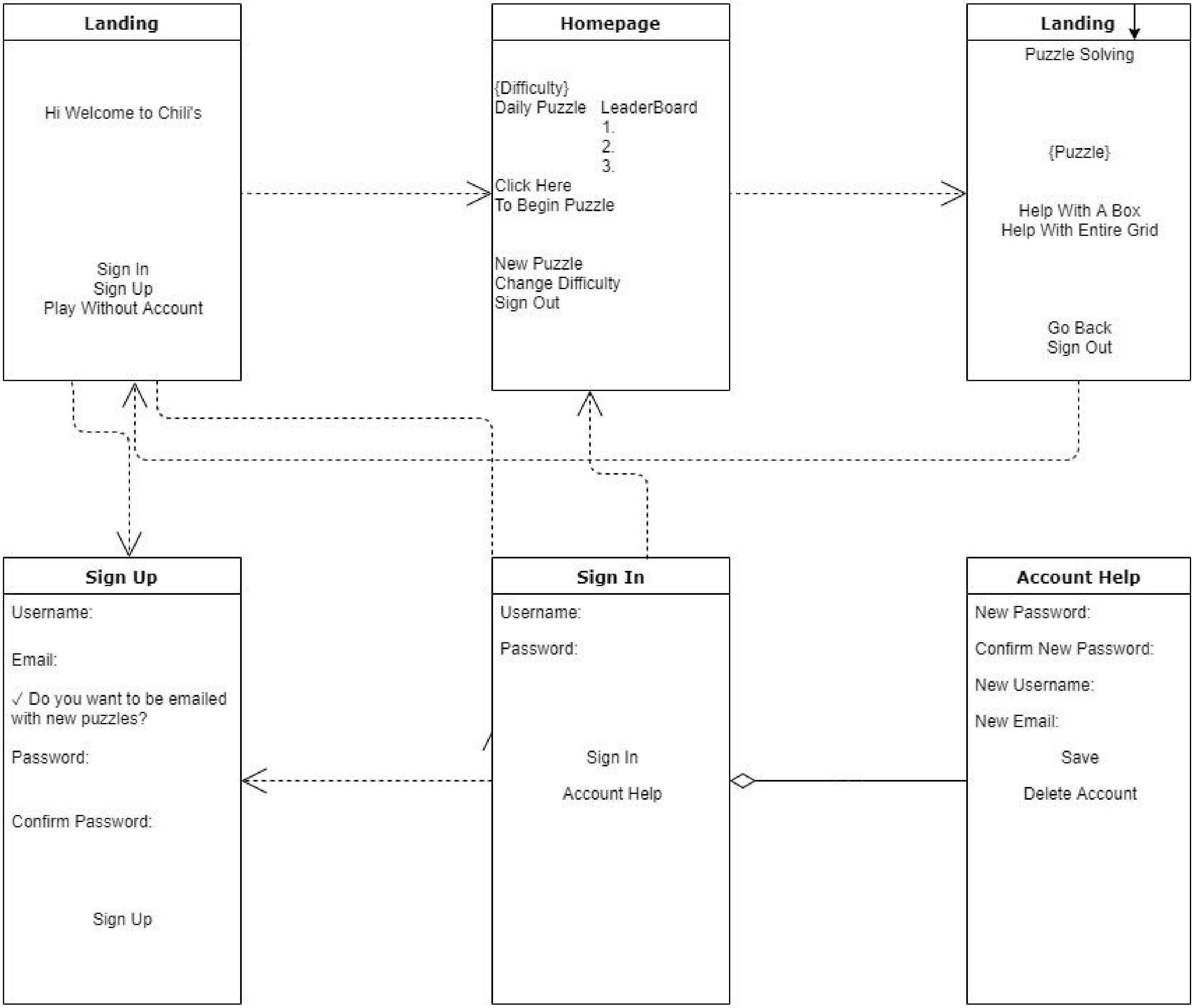
ROLES

1. **Frontend Dev including JS (Ivan and Jesse)**
2. **DB Management and Design (Ivan)**
3. **User Accounts and log in (Ivan)**
4. **Sudoku Solver and Generator (Ayham)**
5. **Email Management (Ayham)**
6. **Frontend Design including CSS (Hong Wei and Ayham)**
7. **Leaderboards (Hong Wei)**

COMPONENT MAP



SITE MAP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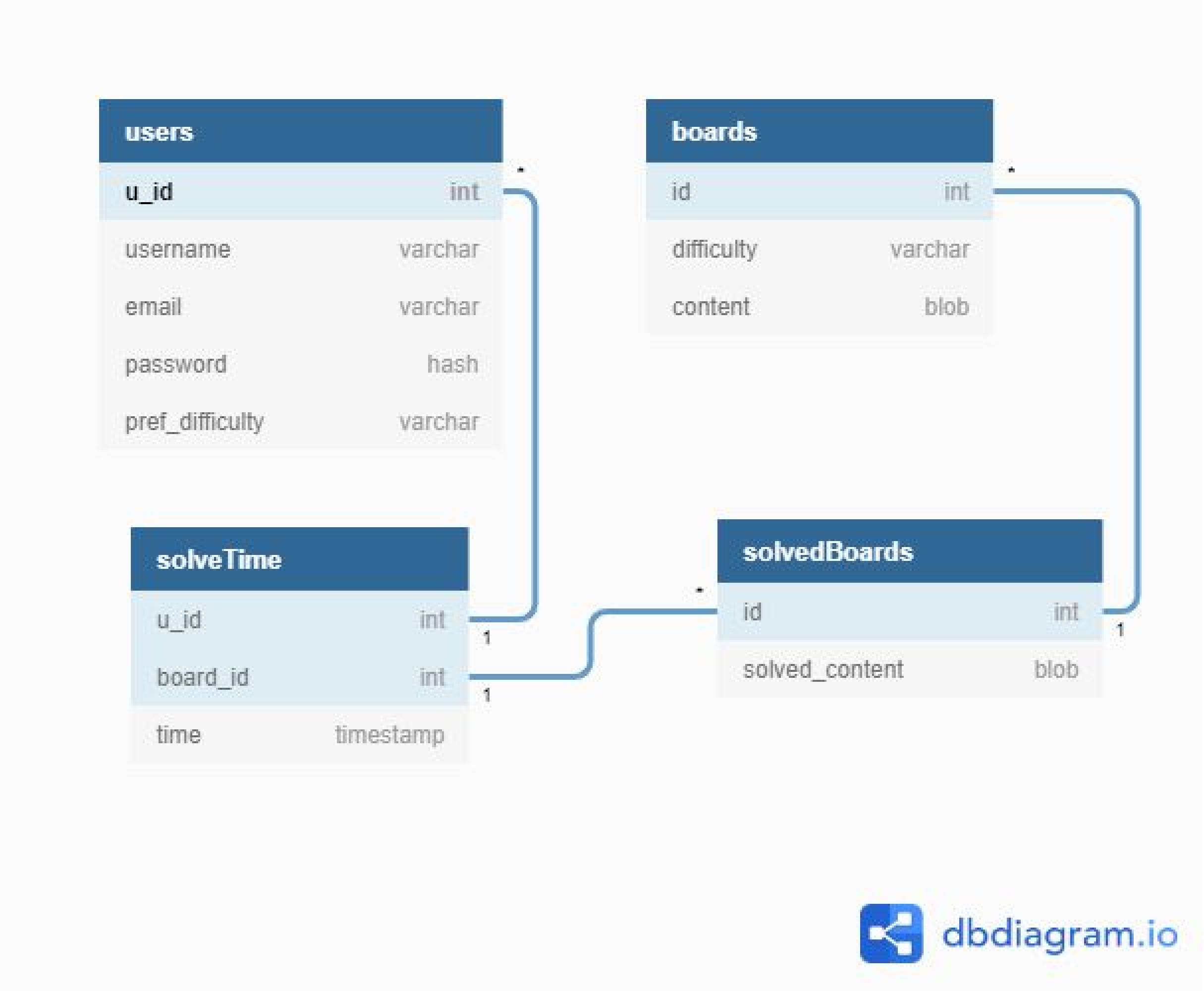
Sign In
Sign Up
Play Without Account
Homepage
{Difficulty}
Daily Puzzle
LeaderBoard
1.
2.
3.
Click Here
To Begin Puzzle
New Puzzle
Change Difficulty
Sign Out
Landing
Puzzle Solving
{Puzzle}
Help With A Box
Help With Entire Grid
Go Back
Sign Out
Sign Up
Username:
Email:
✓ Do you want to be emailed with new puzzles?
Password:
Confirm Password:
Sign Up
Sign In
Username:
Password:
Sign In
Account Help
Account Help
New Password:
Confirm New Password:
New Username:
New Email:
Save
Delete Account

DATABASE MAP



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email	varchar
password	hash
pref_difficulty	varchar

boards	
id	int
difficulty	varchar
content	blob

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board_id	int
time	timestamp

solvedBoards	
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solved_content	blob