DEWEY DECIMAL TRAINER APPLICATION (V1.2) – DESIGN DOCUMENTATION

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Contents

Overview

The purpose of this document is to provide the user with guidance and insight on the Dewey Decimal Trainer application developed for a local library.

The application was developed in the C# .Net framework 4.6.1 WPF and can be run using either Visual Studio 2017 or 2019 integrated development environments. User records are stored in a local SQL Lite database which the application accesses using a Data Access Layer. SQLite.EF6(Database framework) with Dapper(object-relational mapping) are used for querying the database.

The purpose of the application is to make training library members on using the Dewey Decimal Classification(DDC) System a fun and engaging experience. To achieve this, the application uses gamification features . Training lessons provided by the application are as follows:

The application trains users on:

- identifying a books broad area
- finding the call number for a specific book topic
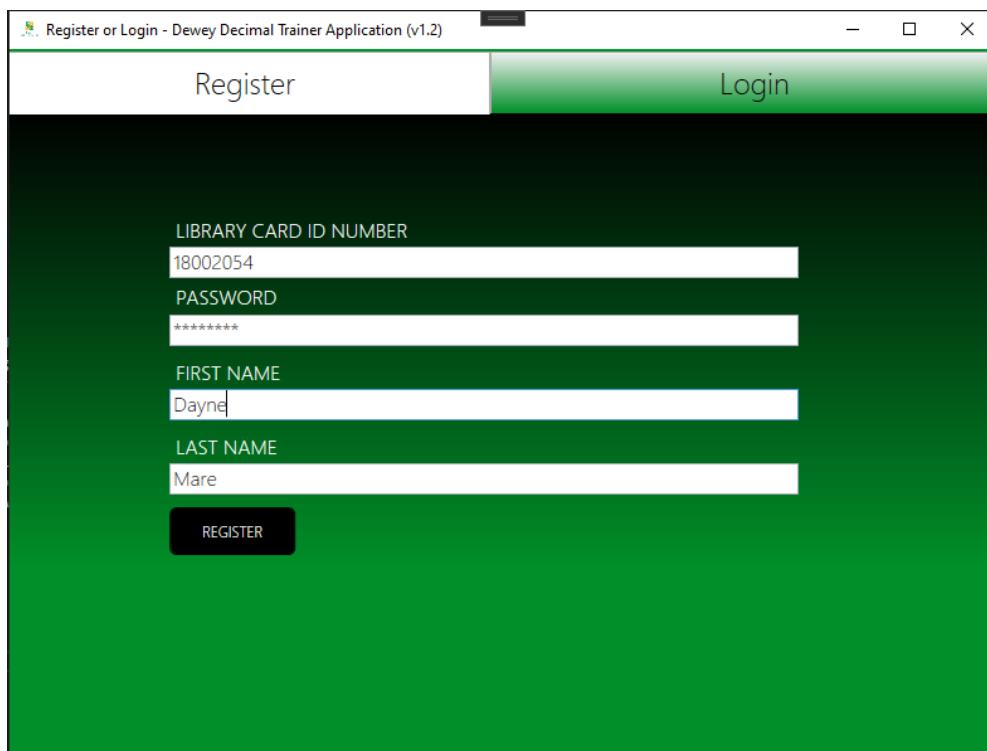- how to replace a book correctly on a library shelf in compliance with the DDC.

Functionality List

The Dewey Decimal Trainer application can perform the following functional requirements (Detailed descriptions provided in the **User Manual** section):

- **User Registration**
- **User Login**
- **DDC Trainer Game Mode – Replacing Books**
- **DDC Trainer Game Mode – Identifying Areas**
- **DDC Trainer Game Mode - Finding Call Numbers**
- **Leaderboards**
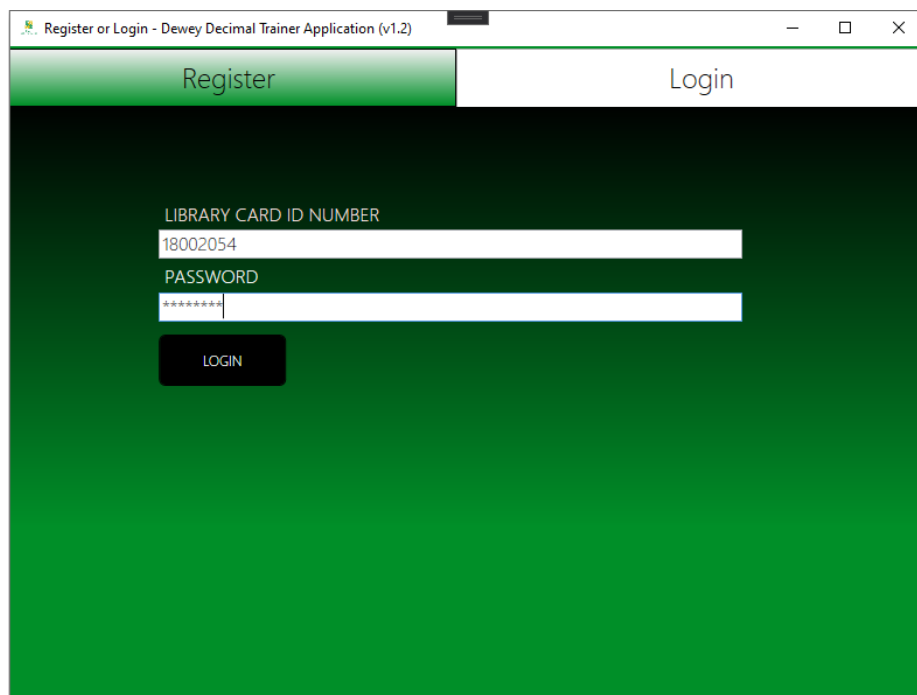- **Sign Out**

User Manual
<u>User Registration</u>

Each library member is required to register an account with the application to track their learning and game progress.

The user is required to fill in all fields which are <u>an 8-digit library card ID number</u> **(must be a number),** a <u>password</u> to use to access the **account (don't forget your password, max length is 50 characters)**, their <u>first name</u>(**max length is 50 characters**), and finally their <u>last name</u> **(max length is 50 characters)**. An example is shown in the image above.

Once all these fields have been filled the user can then click the **REGISTER** button to complete registration.
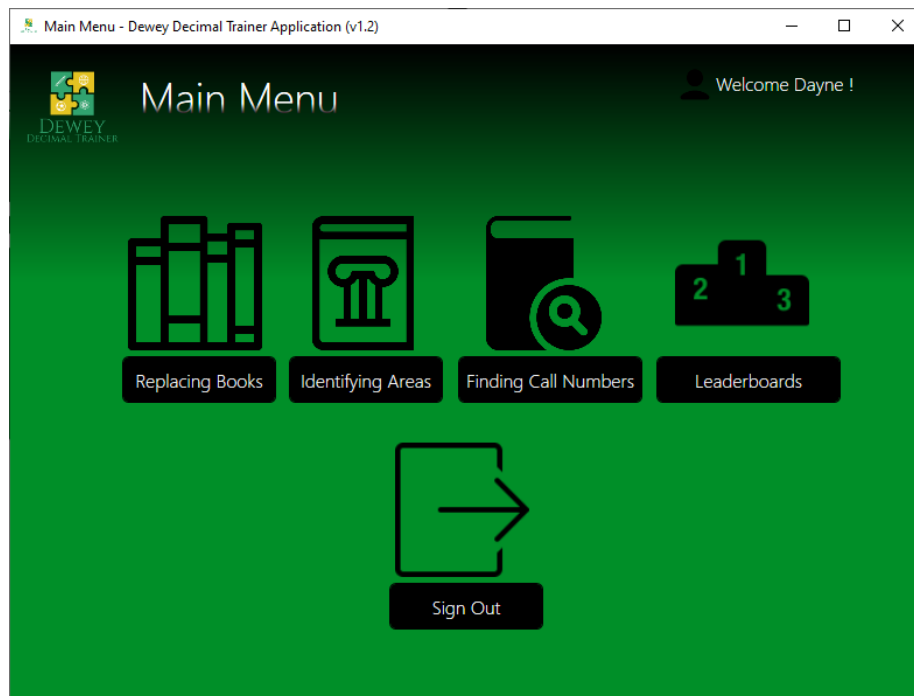
User Login

The gain access to the functionality of the application the user is required to enter the <u>library card ID number</u> and <u>*password*</u> they registered their account with.

Once these fields have been filled correctly the user can click the **LOGIN** button and should now be presented the **Main menu** window.

Main Menu/Sign out

The main menu allows is the central navigation hub for the functionality of the application. Here the user has access to the following features :

- **Replacing Books** - a game mode that trains the user on how to replace books correctly on the library shelf in compliance with the DDC.
- **Identifying Areas -** a game mode that trains the user to memorize top level DDC categories and their corresponding call numbers.
- **Finding Call Numbers -** a game mode that trains the user to find their way around the DDC hierarchy to find a specific book topic).
- **Leaderboards –** Allows the user to view the leaderboards for each game mode to see how well they are doing in comparison to their fellow library members.
- **Sign Out –** When the user is finished using the application they can sign out of their account with this feature.

To use anyone of the listed features the user is required to click the button with the feature name on it.

DDC Trainer Game Mode – Replacing Books
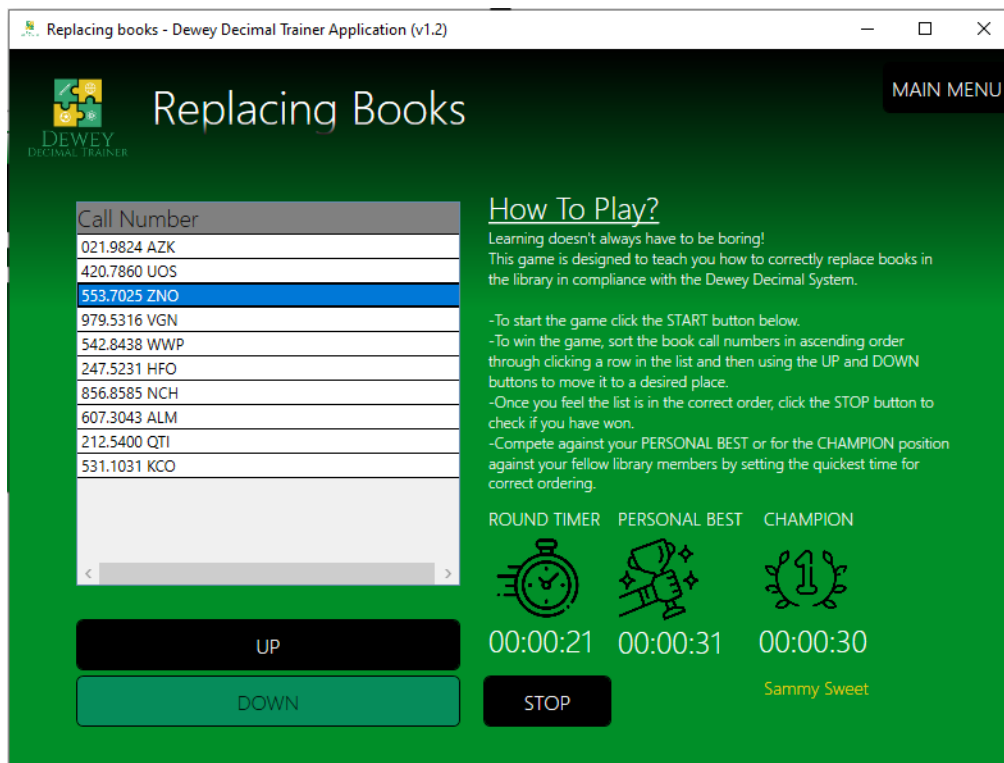
This feature is designed to teach the user how to correctly replace books in the library in compliance with the Dewey Decimal System. To start the game the user must click the **START** button. To win the game, the user must sort the book call numbers in ascending order through clicking a row in the list and then using the **UP** and **DOWN** buttons to move it to a desired index in the list. Once the user feels the list is in the correct order, they can click the **STOP** button to check if they have won. The user can compete against their **PERSONAL BEST** or for the **CHAMPION** position against their fellow library members by setting the quickest time for correct ordering.
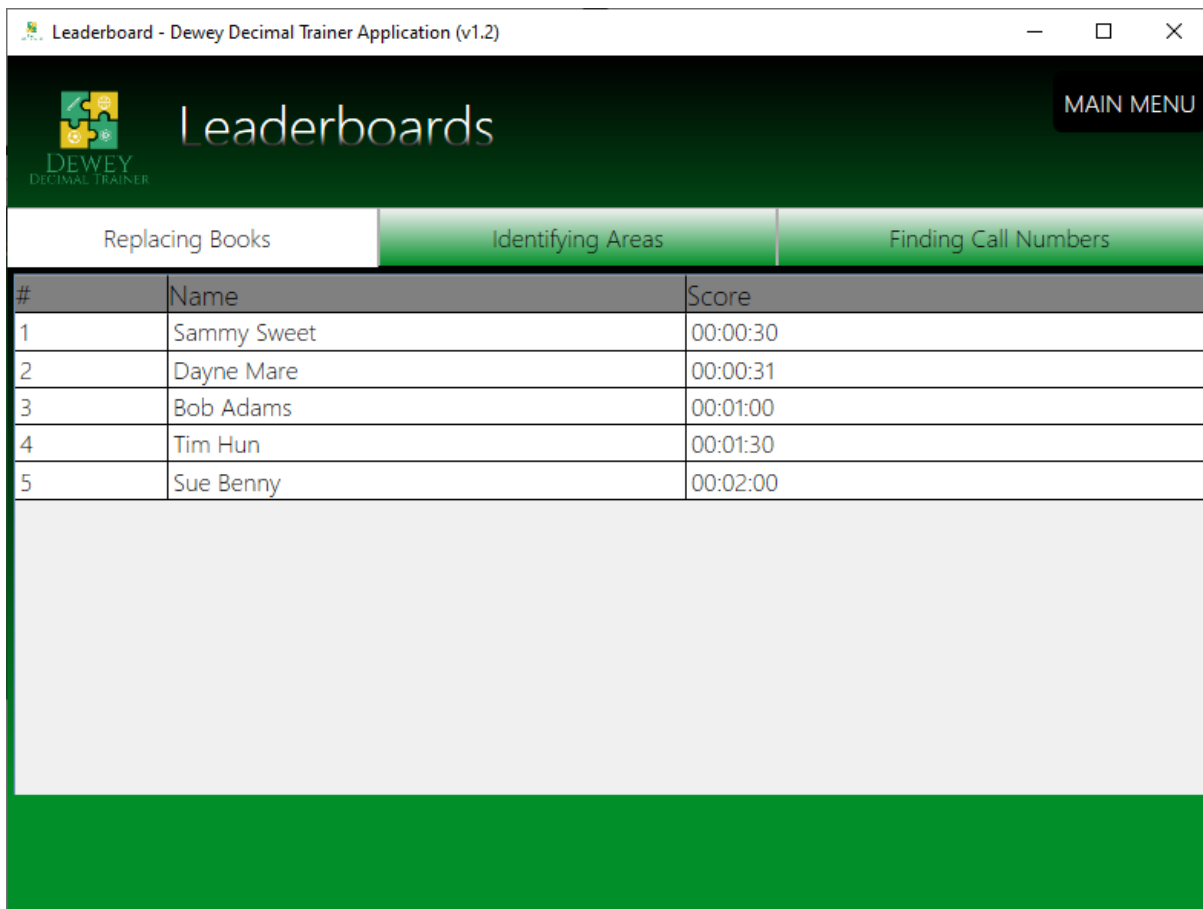
DDC Trainer Game Mode – Identifying Areas
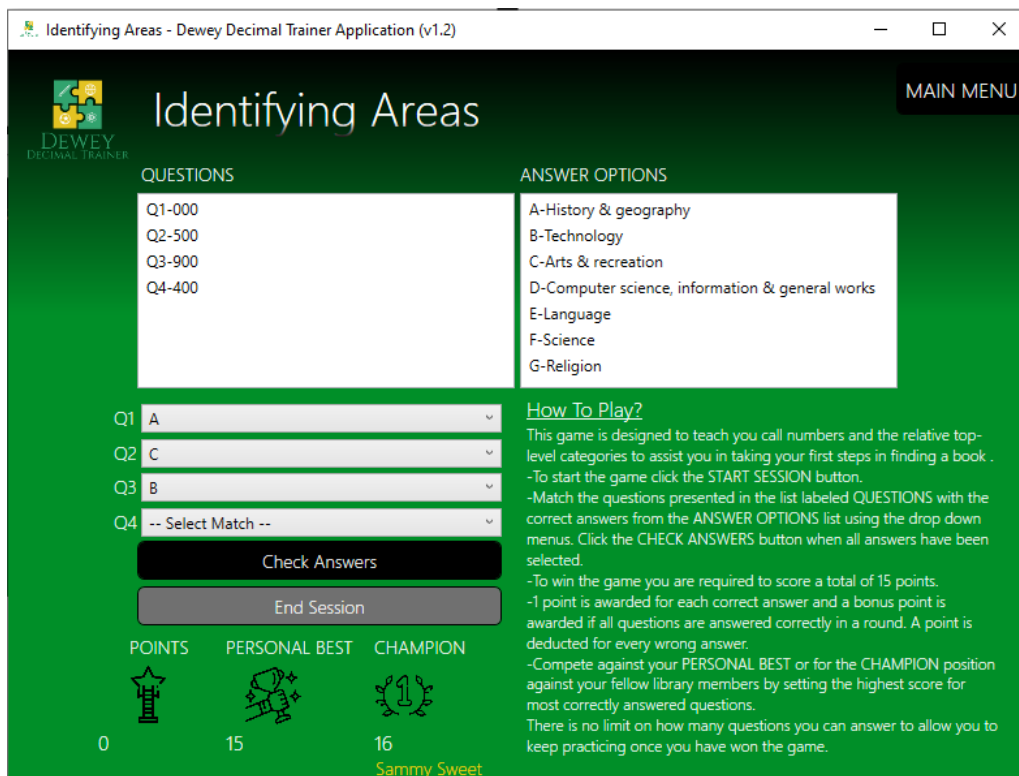
This game is designed to teach the user call numbers and the relative top-level categories to assist the user in taking their first steps in finding a library book . To start the game the user must click the **START SESSION** button. The user must match the questions presented in the list labeled **QUESTIONS** with the correct answers from the **ANSWER OPTIONS** list using the drop-down menus. The user must Click the **CHECK ANSWERS** button when all answers have been selected. To win the game the user is required to score a total of 15 points in a session.1 point is awarded for each correct answer and a bonus point is awarded if all questions are answered correctly in a round. A point is deducted for every wrong answer. To end the current session the user can click the **END SESSION** button. The user can compete against their **PERSONAL BEST** or for the **CHAMPION** position against their fellow library members by setting the highest score for most correctly answered questions. There is no limit on how many questions the user can answer to allow them to keep practicing once they have won the game.

DDC Trainer Game Mode - Finding Call Numbers
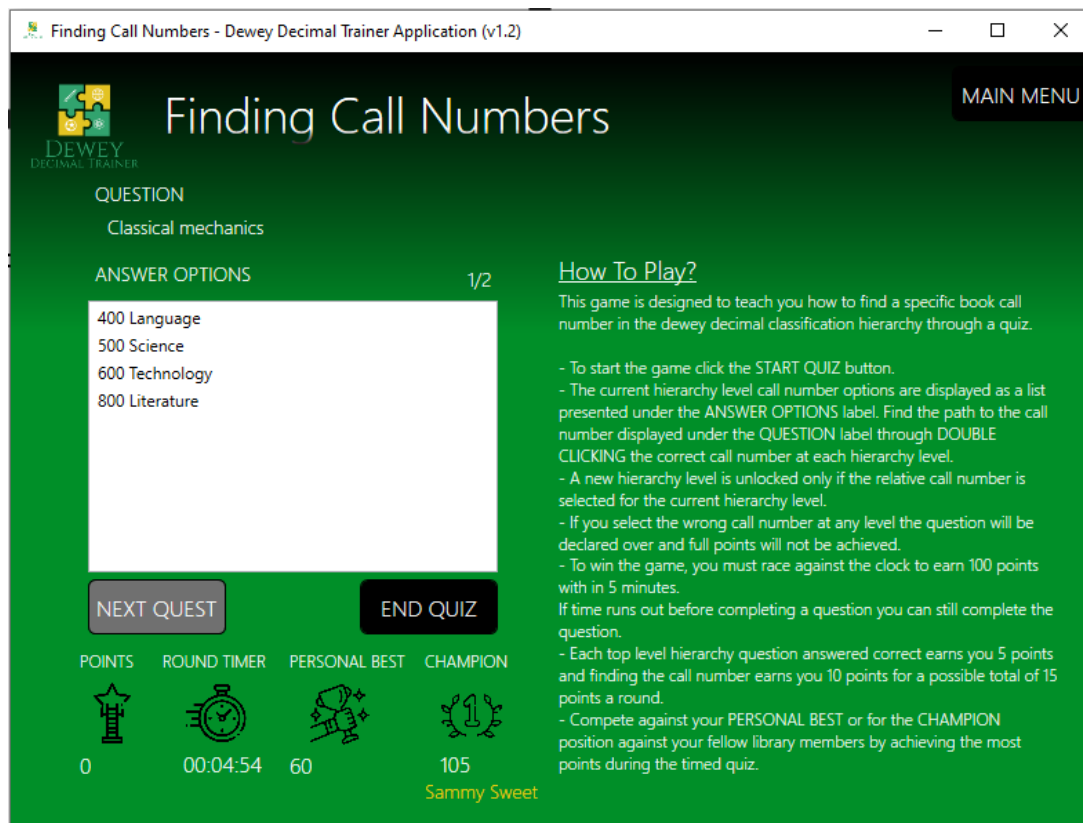
This game is designed to teach the user how to find a specific book call number in the dewey decimal classification hierarchy through a quiz. To start the game, the user must click the **START QUIZ** button. The current hierarchy level call number options are displayed as a list presented under the **ANSWER OPTIONS** label. Find the path to the call number displayed under the **QUESTION** label through **DOUBLE CLICKING** the correct call number at each hierarchy level. A new hierarchy level is unlocked only if the relative call number is selected for the current hierarchy level. If the user selects the wrong call number at any level the question will be declared over, and full points will not be achieved. To win the game, the user must race against the clock to earn 100 points within 5 minutes. If time runs out before completing a question the user can still complete the question. Each top-level hierarchy question answered correct earns the user 5 points and finding the call number earns the user 10 points for a possible total of 15 points a round. The user can compete against their PERSONAL BEST or for the CHAMPION position against their fellow library members by achieving the most points during the timed quiz.

Leaderboards

#	Name	Score
1	Sammy Sweet	00:00:30
2	Dayne Mare	00:00:31
3	Bob Adams	00:01:00
4	Tim Hun	00:01:30
5	Sue Benny	00:02:00

This feature allows a user to click the **tab** of the corresponding game mode to view where they stand in the rankings compared to other library users on a leaderboard. Each row on the leaderboard describes a users current position, their full name and their best score for the relevant game mode.

Use Case Diagram
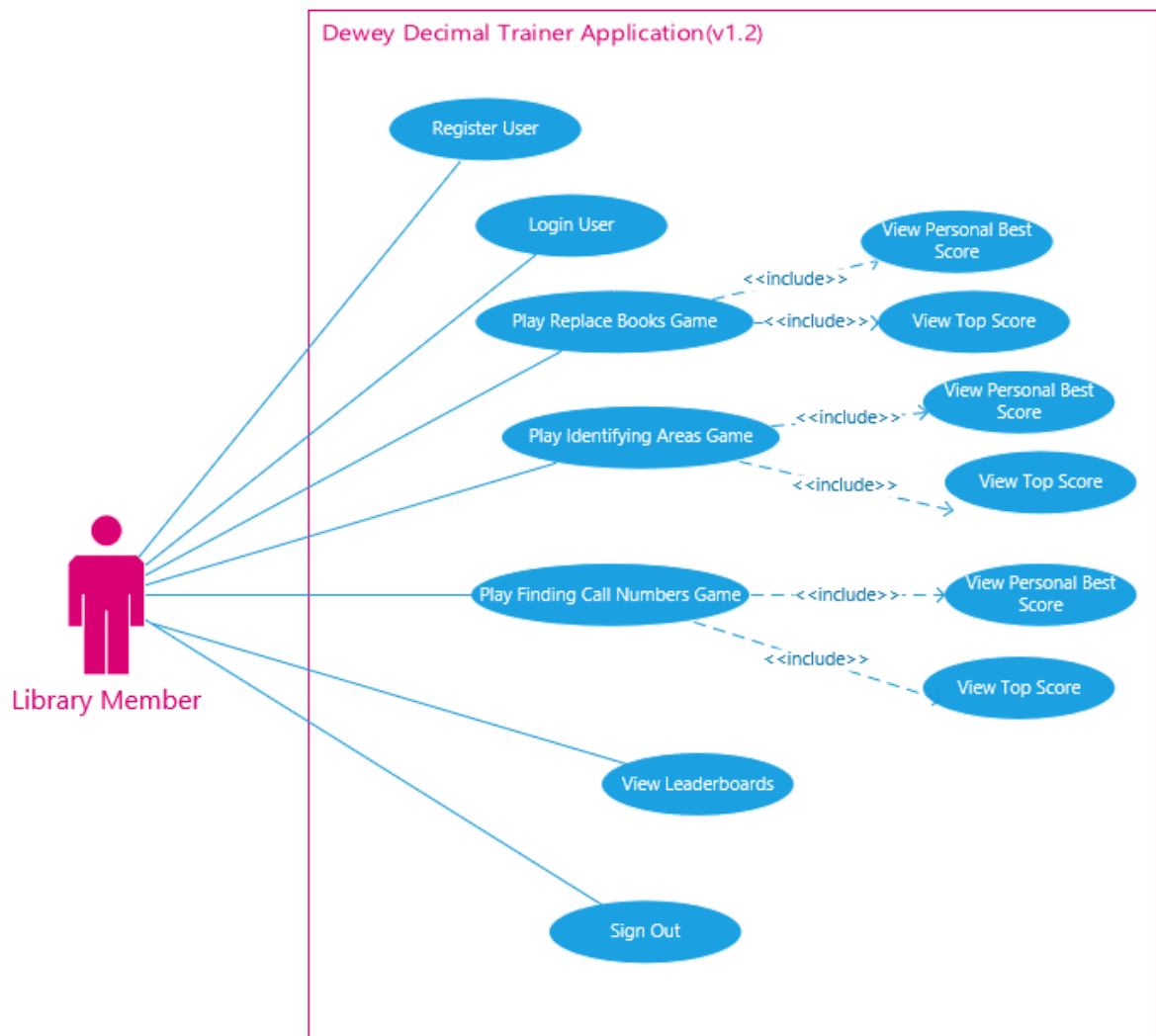
Database Schema

The following entities make up the database schema.

USER

PK	USER_LIBRARY_CARD_ID
	USER_PASSWORD
	USER_FNAME
	USER_LNAME

The USER table is responsible for storing data about the user for authentication purposes. This table is also used along side the LEADERBOARD table when a user's first and last name need to be displayed on screen.

LEADERBOARD

PK FK	USER_LIBRARY_CARD_ID
	REPLACING_BOOKS_PERSONAL_BEST
	IDENTIFYING_AREAS_PERSONAL_BEST
	FINDING_CALL_NUMBERS_PERSONAL_BEST

The LEADERBOARD table is responsible for storing the users best score for each game mode. This data here is used for leaderboard functionality, to track user progress and to be shown to the user as a target during game modes.