Project– The ChessTrainer Application

Background
ChessTrainer is an app that will target chess players looking at improving their pattern recognition and knowledge of certain opening or midgame lines and variations.

The application will take certain sequences of chess moves (input by the user) and store them locally in libraries. The user will then be able to load those libraries to review and practice them.

The application will keep score of how the user is doing in every practice session.

System Features
This application required to have the following features built into it:

ChessTrainer will have only one type of user. There is no registration or Login required. ChessTrainer will not have any online playing (i.e. no playing chess online) or against any other players online or offline.
Libraries and other information will be stored locally
The pages that required are:
- Open Page (includes Name, Logo and App info)
- Main Home Page includes:
  - List of libraries
  - 'Trainer' button
  - 'Add Library' button
  - 'View Library' button
  - 'Rename Library' button
  - 'Delete Library' button
  - Small logo icon (Will be provided)

The functions of the system are explained below in detail:
- Home page
  - The home page should include clear list of the libraries, and clear links to the other features (Trainer, Add Library, View Library Delete Library)
  - Libraries:
    - The list of libraries will initially have only one library – This is to demonstrate to the user how the app work.
    - The List should display the sum of all libraries (1 initially)
    - The initial library's name will be called "The Spanish Opening". The Spanish opening is a very well-known chess opening and it has many variations.
    - Each library will contain one or more 'Lines'. A 'Line' will be defined as a sequence of chess moves and will be explained in detail in later sections.
    - This 'Spanish Opening' library will initially contain two 'Lines'.
    - All libraries should show the number of 'Lines' they contain.
    - All libraries will show a radio box for selection.
    - An example is shown below:
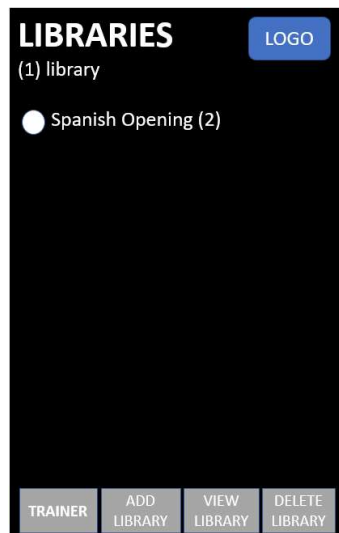
- o TRAINER: will be detailed in the 'Trainer' section
- o ADD LIBRARY: This feature will allow the user to create a new library.
  - New libraries will be added to the local storage (saved locally)
  - There is no limit on the number of libraries to add
 - Duplicate names are not allowed.
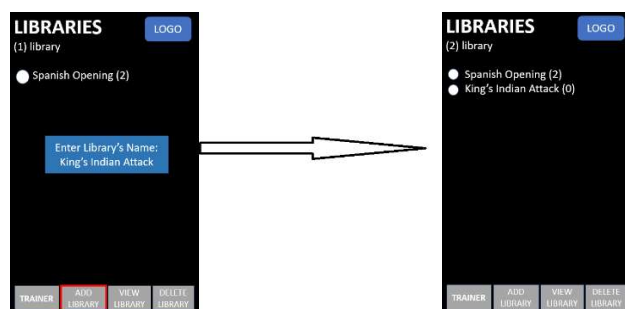
- o VIEW LIBRARY: will open the selected library and display the 'Lines' of that library
- o RENAME LIBRARY: will allow renaming the library – duplicate names aren't allowed.
- o DELETE LIBRARY: will remove the library and all its contents. A confirmation message should be displayed. The initial library (Spanish Open) can be deleted as well. (However, if the app is reinstalled, the Spanish Open library should be there)

- LINES Page
  - o Lines are defined as sequence of chess moves.
  - o The lines are contained and displayed in the libraries. They are accessed through 'VIEW LIBRARY' (as explained above)
  - o The Title of the library should be displayed on the top.
  - o The total number of lines should be displayed.
  - o Each line will show the number of moves contained in this line.
  - o There will be the following links in the 'LINES page'
    - Trainer
    - ADD LINE
    - VIEW LINE

- RENAME LINE
- DELETE LINE

- The initial line (on installation) will be 'Morphy Defense' and it will contain 3 moves.
- Example of the line page is shown below:

SPANISH OPENING
(1) Lines   LOGO

● Morphy Defense (3)

TRAIN LINE | ADD LINE | VIEW LINE | DELETE LINE
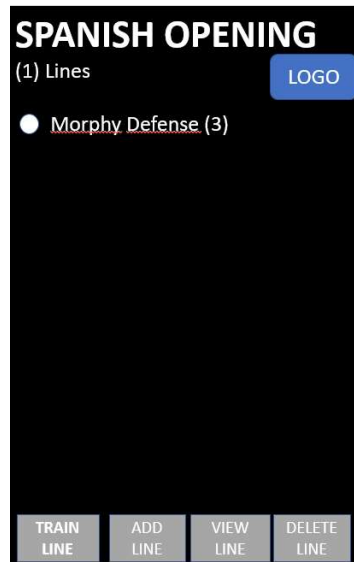
- TRAIN LINE: will allow the user to train the selected line (will be detailed in later section)
- ADD LINE:
  - will add new lines in this library. (Explained in detail below)
  - The number of lines should be updated both in this page and the libraries page (Home Page)
  - No limitation of the number of lines
  - Duplicate names are not allowed.
- VIEW LINE:
  - Will allow user to view the line moves on the chess board (will be detailed below)
- DELETE LINE:
  - Will delete the line and all the moves (and update the displayed total number of lines)
  - Confirmation is required before deletion.
- RENAME LINE: will allow renaming the line. Duplicates aren't allowed.

ADD A LINE:

The following occurs when adding a line:

- Prompt a name for the new line. Duplicates aren't allowed
- The chess board page will then be displayed.
- Chess board page:
  - The library name and line should be displayed on top.
  - The chess board with all the pieces are displayed in the starting position

- White pieces always displayed on the bottom initially
- There should be an icon (normally a circle half black half white) that flips the board
- link to a SAVE button (or just save on going back)
- 3 arrows visible under the chess board as displayed in the example ⏮️ ◀️ ▶️
- The moves will be recorded and displayed above the chess board in the following fashion: 1.(white's move) (black's move) 2.(white's move) (black's move) etc…

Making the moves:

- Only legal moves are allowed (according to the normal chess rules)
- To move the pieces the user tap and drag the pieces (like normal chess apps, good example is chess.com mobile app)
- The user move the pieces (white and black) and create a sequence of moves
- The moves are recorded and displayed above the board
- There is no limitation of the number of moves
- The user is able to go backward and forward through the moves using the arrows:
  - ⏮️ Back to the first move
  - ◀️ Back one move
  - ▶️ Forward one move
- When finished, the user saves the line (or go back and saves automatically)
- The user will be redirected to the previous page where now the new line is visible with the number of moves.
  - Replacing moves: if the user makes 5 moves for example but wishes to change move 3, the user will have to go back using the back arrow to move 3 and play all the new moves again from move 3.
    - Validation: If any move is replaced by new move a confirmation is required: "Overwrite? "
    - If no moves are made, the "Save" will show an alert that "no moves were made"
    - If saving a line that already exist, a notification showed be shown "Line already exist"

In the following example, we added a new line to the Spanish Opening Library. The line is called "Alpin Variation" and we have not added any moves yet.
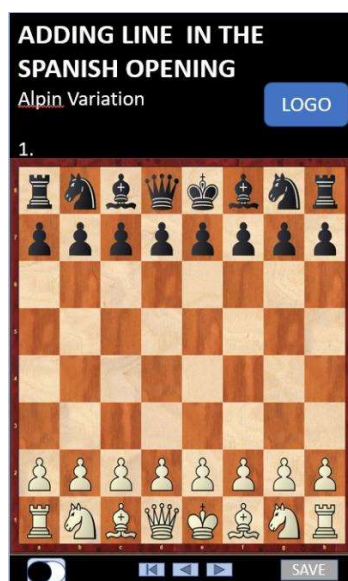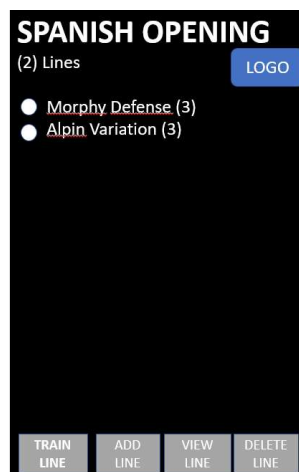
In the following example, we have completed the line by making 3 moves (3 moves for white and 3 for black). The moves are recorded above the chess board:

ADDING LINE IN THE SPANISH OPENING
Alpin Variation
LOGO

1.e4 e5 2.Nf3 Nc6 3.Bb5 a6

- Note: you should be able to flip the board at any time using the semi black semi white circle
- Note: you should be able to swipe the recorded moves right and left once they're out of visible range (over 4 or 5 moves..)

When the line is saved the user will be directed back to the library which will be updated and look similar to the following:


SPANISH OPENING
(2) Lines
LOGO

● Morphy Defense (3)
● Alpin Variation (3)

TRAIN LINE | ADD LINE | VIEW LINE | DELETE LINE

VIEW LINE:

View a selected line will display the chess board in the starting position, with the moves sequence on the top. The player now can review this line by using the arrows to move between the moves.

OVERWRITING: the player is able to change or add moves. If any move is changed or added there will be alert that "The line has been modified" will prompt to "Overwrite the line" or "Save as a new line".

TRAIN LINE:

Train a selected line will prompt the user to choose the colour:
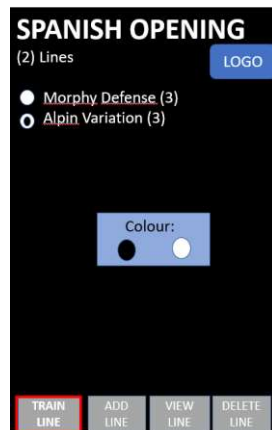
Once the colour is chosen the chess board will be displayed with the same features as before, plus an extra feature – THE SCORE FEATURE (explained below)

NOTE: If the selected colour is black, the black pieces will be displayed on the bottom (towards the user)

TRAINING:

- The user now will play the side he/she chosen and the app will play the other colour according to the moves saved in this line.
- Example: User selects white – board is displayed – User play first move (white always plays first in chess) if the user plays the right move the app will play the move according to the line. In the Alpin Variation of the Spanish Opening for example above, if the user starts with e4 the app will respond with e5 and so on.
- If the user make the wrong move the app will alert the user "Incorrect move" and will take the user's last move back so the user can try again. If the user makes the right move the line continues as normal. If the wrong move is made again, the alert now will show the right move i.e. "Incorrect move. The right move is Nf3" for example.

- SCORE feature:
  - In training mode, there will be score keeping.
  - The score is displayed above the board (or any other place as suitable)
  - The max achievable points is equal to the total number of moves of the line (If a line contain 3 moves the max score is 3)
  - The score is calculated as follows:
    - For every right move the user make, 1 point is earned
    - If a wrong move is made the score will reach its maximum for this line.

TRAINER:

- Trainer is run from the main page (see above)
- One or more libraries need to be selected for the trainer.
- There is no limit on how many libraries can be selected but at least one is required.

- When a library is selected and trainer is tapped, a setting dialog box is opened:
  - The user will be prompted to set the following:
    - Colour (Black or White)
      - This will be the colour the user is playing
    - Shuffle (on or off)
      - If shuffle is turned on, the selected library's (or libraries) lines will be shuffled in random order
    - ALL Lines (on or off)
      - If this feature is turned on all the selected library's (or libraries) lines will be included in the trainer, otherwise all lines will be displayed in a list with radio box near them for possible multiple selection
- Once the settings are done the chess board will be displayed with the first line
- All the features now will be similar to "**TRAIN LINE**" as above (moves, score, display) The only difference that here we may have multiple lines included and the score of each line will be accumulating.
  - Example if a Library (containing 5 lines) is selected for the trainer, then once the first line is completed, the next line will be displayed and the score of all lines will be added.
- At the end of all lines the final score will be displayed to user out of the maximum achievable score.

UI and technical requirements

- The UI can be similar to the above examples but opened to any other design or suggestions, for example Instead of buttons with names, icons can be included (i.e instead of "ADD" a + icon can be displayed)
- The project need to perform bug free on Android
- Logo and background images can be provided
- Chessboard and pieces preferable as in the examples above
- Good reference app for chess movements etc is Chess.com
- Original source code needs to be provided
- API integration may be necessary for Lines

Milestones:

1- Milestone 1: Complete design and navigation and functionality of links
2- Milestone 2: Complete functionality of the trainer and its features
3- Milestone 3 : validation and testing

Happy to discuss further comments or questions.

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