PROJECT PROPOSAL
Chess Performance Analyzer

Table of Contents

Project Proposal

Project Abstract

In this project, we propose developing the Chess Performance Analyzer, a program allowing you to input a chess game and get analysis on all your moves including an accuracy rating and an overall summary on an area to improve upon. This product is different from similar chess analysis tools because it gives you concise summaries on areas you missed over the course of the game. It would give users a personalized message like "You struggle with pawn movement and board control" relative to their own mistakes. The software takes a PGN link from a chess game and analyzes all your moves, then provides a report and rating on all of them and an overall summary of your weak points. The intended users of our program would be beginners to intermediate chess players looking for a way to quickly spot their weaknesses and mistakes in a more digestible and easier to understand way. This project is valuable because it provides a new simpler way to improve, especially for players just starting as they can't recognize their own mistakes.

High Level Requirement

The product lets users input a PGN file they have downloaded or link their profile from any online chess website, and our site will use stockfish to analyze their chess moves and then create a graph showing data analysis on their performance.

Conceptual Design

I will use the python-chess package to parse PGN files over multiple threads to collect data across multiple games at once and then use the Stockfish chess engine to calculate move scores across each PGN. I will then collect the game analyses and mistakes into pandas DataFrame and use matplotlib to create trend maps and visualize your performance so users can identify their recurring mistakes. This system will be coded in python using the python-chess library, the Stockfish engine that can be run through python-chess library, and the matplotlib and pandas libraries for data analysis and graphs.

Proof of Concept

https://github.com/CIS3296SoftwareDesignF21/Lichess-Multi-Board-Analysis-Tool
This uses similar tools but none of the code will be used in this project. https://github.com/niklasf/python-chess python-chess which will be used in this project.

Background

This product will let you input a link to your own chess games and will give you a rundown of all your moves with accuracy ratings and a summary of your mistakes. This is similar to the chess.com coach, except this project will specialize in short summaries on what you need to improve on and will allow you to upload multiple games at once to get a summary of your weak points over all the games combined which is not a feature on chess.com.

Required Resources

Python-chess library, matplotlib library, pandas library

Project Design

Vision

FOR chess beginners WHO want to improve at chess systematically, THE Chess Performance Analyzer is a python program THAT allows users to see graphs of their performance grades from the StockFish chess engine. UNLIKE chess.com and other chess improvement sites, OUR PRODUCTallows users to analyze multiple games at once and see their performance represented visually through a graph.

Persona Frank, student

1. *Frank Bob – Chess Advocate*

   - *Name: Frank Bob*
   - *Age: 21*
   - *Occupation: College Student and Part-Time Server*
   - *Educational Background: Some college*
   - *Technology Experience:*
       - *Average tech knowledge for his age. Proficient use of a laptop.*
       - *No coding or computer science knowledge.*
   - *Demographics:*
       - *Resides in North Philly around Temple University's campus.*
       - *Single, 1 cat.*
   - *Why They'd Use Chess Analyzer:*
       - *To further his knowledge on chess strategy through an analysis of his gameplay*
       - *To learn what moves have put him in losing positions during his previous games.*
       - *To see what caused him to go from winning to losing (or vice versa) and study the moves.*

Persona Emily, event planner

2. Emily Carter – Game Tournament Planner
   - Name: Emily Carter
   - Age: 37
   - Occupation: Event Planner
   - Educational Background: Bachelor's degree in hospitality

- Technology Experience:
  - Average tech knowledge for her age. Proficient use of a laptop.
  - No coding or computer science knowledge.
- Demographics:
  - Resides in North Philly around Temple University's campus.
  - Single, 9 cats.
- Why They'd Use Chess Analyzer:
  - To get an understanding of the skill level of people planning to attend her event.
  - The data can help her organize different brackets for skill levels.

Persona Cole, student

3. Cole Tom – High School Chess Advocate
   - Name: Cole Tom
   - Age: 18
   - Occupation: High School Senior
   - Educational Background: Highschool
   - Technology Experience:
     - Average tech knowledge for his age. Proficient use of a laptop.
     - No coding or computer science knowledge.
   - Demographics:
     - Resides in the suburbs of Philadelphia.
   - Why They'd Use Chess Analyzer:
     - To further his knowledge on chess strategy through an analysis of his gameplay
     - To learn what moves have put him in losing positions during his previous games.
     - To see what caused him to go from winning to losing (or vice versa) and study the moves.
     - To find out what he needs to practice for chess scholarships.

Persona Joe, professional chess player

4. Joe Shmoe – Professional Chess
   - Name: Joe Shmoe
   - Age: 29
   - Occupation: Chess Player
   - Educational Background: Masters in mathematics
   - Technology Experience:
     - Average tech knowledge for his age. Proficient use of a laptop.
     - No coding or computer science knowledge.
   - Demographics:
     - Resides in North Philly around Temple University's campus.

- Single, 1 cat.
- Why They'd Use Chess Analyzer:
    - To further his knowledge on chess strategy through an analysis of his gameplay
    - To learn what moves have put him in losing positions during his previous games.
    - To see what caused him to go from winning to losing (or vice versa) and study the moves.
    - To practice his strategy to prepare for tournaments.

Persona Jaclyn Kennedy, Event Planner

- *Name: Jaclyn Kennedy*
- *Age: 45*
- *Occupation: High School Event Planner*
- *Educational Background: College Graduate*
- *Technology Experience:*
    - *Average tech knowledge for his age. Proficient use of a laptop.*
    - *No coding or computer science knowledge.*
- *Demographics:*
    - *Resides in North Philly around Temple University's campus.*
    - *Single, 1 cat.*
- *Why They'd Use Chess Analyzer:*
    - *To get an understanding of the skill level of people planning to attend her event.*
    - *The data can help her organize different brackets for skill levels.*
    - *Organize participants based on their chess data.*

Class Diagram
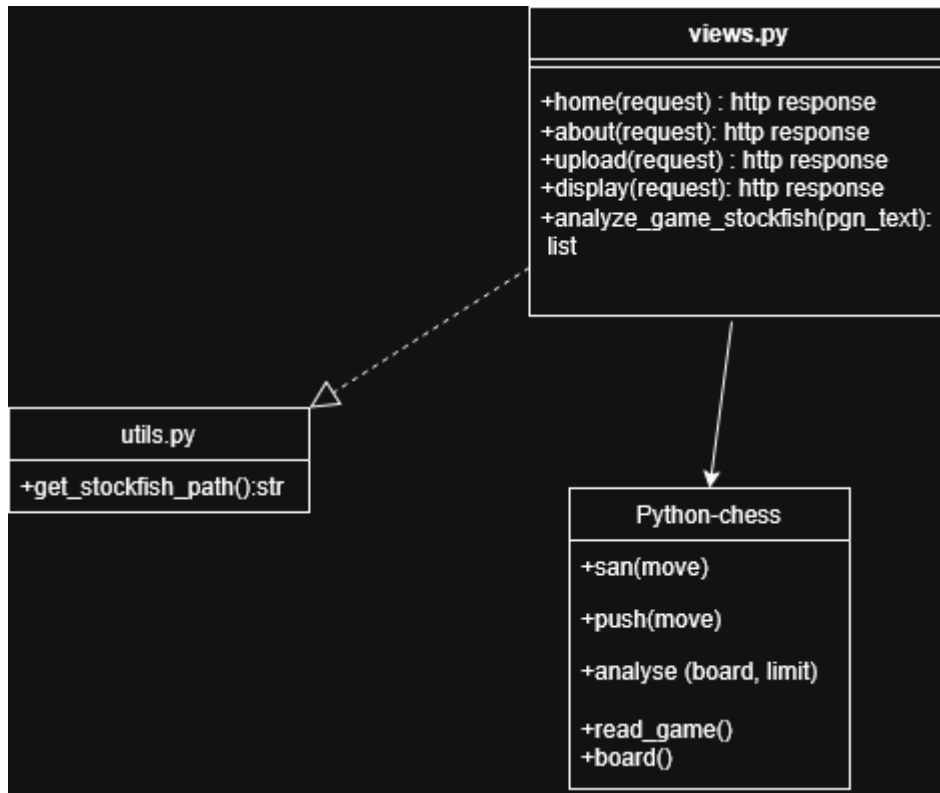
Views.py has functions home, about, upload, display and analyze game which all take a request from a user on the page and return something happening on the website. The last function takes a pgn filename and returns a list of each move with its evaluation. Views.py uses the python chess library for its functions +san, +push, +analyze, +read_game, and + board which are all used to help analyze and run through each move in the game that was submitted by the user. These functions are used in views during the analyze_game_stockfish function. Views.py also uses utils.py to get the path of stockfish which is used in the analyze_game_stockfish function.

Sequence Diagram

User requests list of move evaluations

User clicks and uploads a file on the browser, the browser saves the filename and its content and sends it to views which opens, reads, then does the analyze_game_stockfish function with the file. Views then sends a request to utils which will find the path of stockfish and return it to views. Then views.py and the python chess library enter a loop where ever move is analyzed by python chess and then the evaluation is returned to views and stored in a list. Views then redirects the page to display to show the list, which then appears for the user.
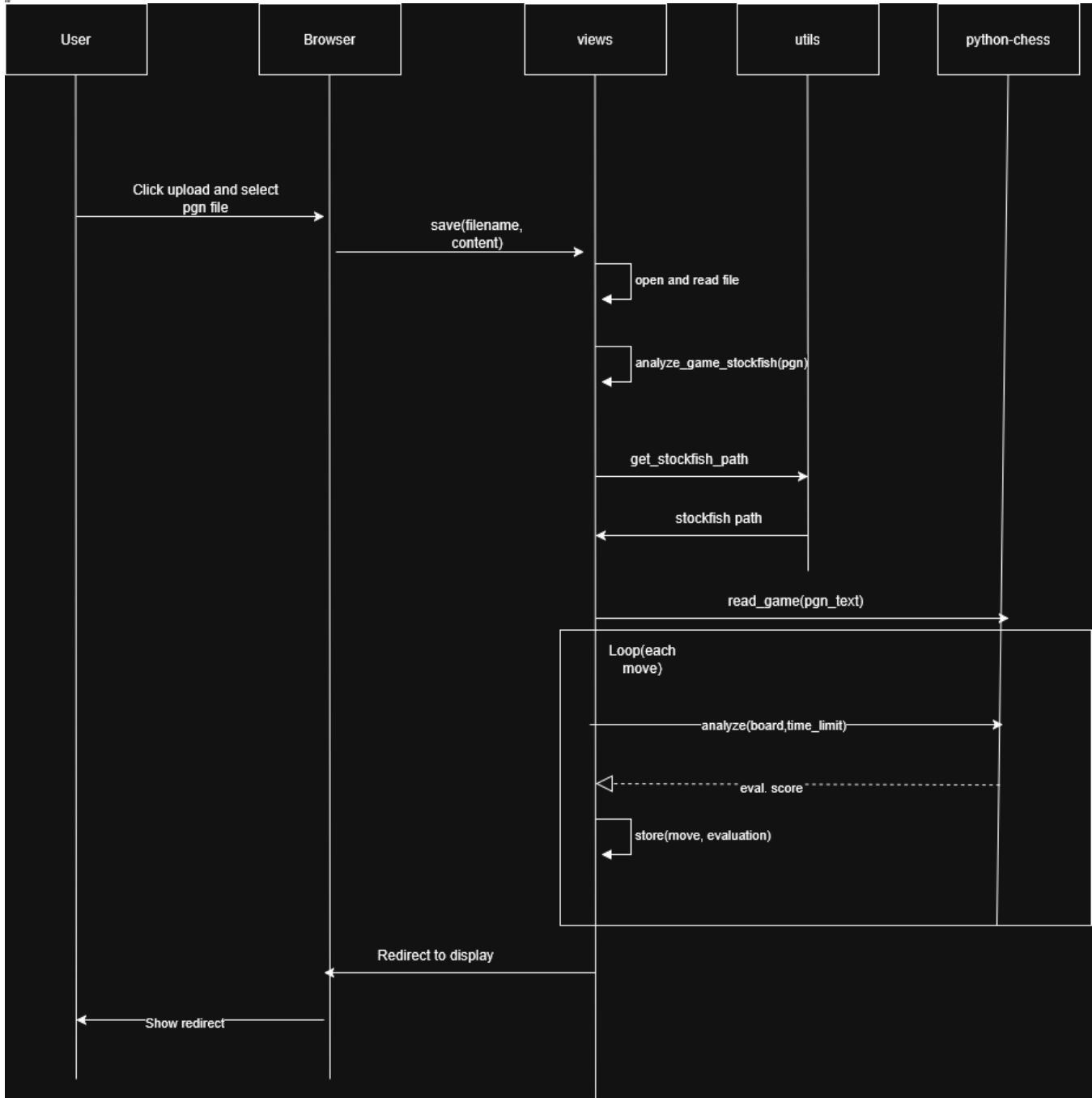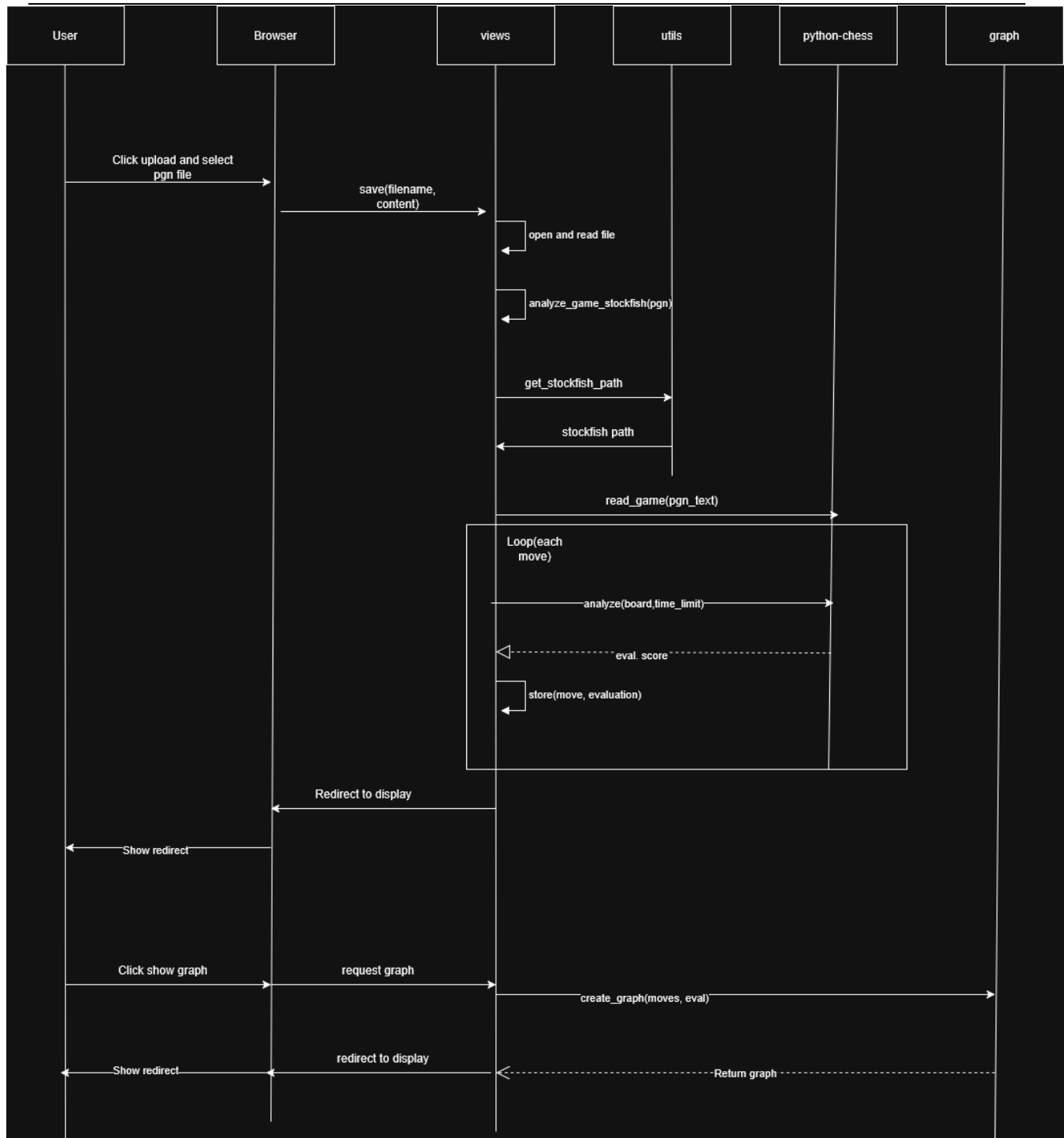
User requests graph showing game state

This graph is the same except for the end where the user will click show graph on their browser, which requests a graph to views which calls function create_graph to a class graph which will return the graph back to the user the same way the list of evaluations was returned.

Project Progress

Week 2 Progress

Scrum Master: Ian

Sprint Goal: Allow files to be uploaded to the site and work on the front end.

Backlog Features

Create storage for uploaded files

Tasks in Sprint	Task Status at end of Sprint	Assigned To
Allow files to be uploaded	Completed	Michael
Work on front end	Completed	Jesse
Analyze files with chess engine	Completed	Andrew, Justin
Use chess api to get game files	Completed	Ian

Week 3 Progress

Sprint Goal: Implement all new features onto the front end, continue to work on APIs and finish the reports

Scrum master: Jesse

Backlog Features

Front end

Project report

Api being called in the backend

Tasks in Sprint	Size	Task Status at end of Sprint	Assigned To
Work on the front end	L	Partially completed	Jesse
Work on project report	M	Completed	Andrew
Call apis	M	Partially completed	Ian
Implement ability to create graphs	M	Partially completed	Michael, Justin

Estimated Velocity (At beginning of Sprint)	14
Calculated Velocity (At end of Sprint)	3~

Week 4 Progress

Sprint Goal: Implement all new features onto the front end, continue to work on APIs and finish the reports
Scrum Master: Justin

Backlog Features

> Front end
>
> Project report
>
> Api being called in the backend
> Graph creation

Tasks in Sprint	Size	Task Status at end of Sprint	Assigned To
Work on the front end, fix stockfish issue **Work on uml diagrams and file parsing** **Work on api integration** **Work on getting our site onto the cloud** **Implement ability to create graphs**	L M L M	Completed Completed Partially completed Complete	Jesse Andrew Ian Michael Justin

Estimated Velocity (At beginning of Sprint)	16
Calculated Velocity (At end of Sprint)	11