Milestone 2 - Data Visualization

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1 Introduction

Our project aims to present the different aspects of the game of chess to beginner and non-beginner players through an interactive website. We use a data set of 20'000 chess games to present the users with the kinds of plays that are done in real online games.

2 Main Visualisations

2.1 Tutorial

This visualisation aims to teach the rules of chess by demonstrating the possible moves of each piece and by explaining the different rules (illegal moves, end of game, draw etc.). We plan to accompany each rule with a visual demonstration of a case where it comes into place.

2.2 Opening Explorer

Explore the different theoretical openings and what kind of players use them and what are the typical outcome of a game after using a specific opening. The user has two options: select one of the openings in the list or click on the die to be presented a random opening. Once an opening is selected, it gets played automatically and some additional information appears such as: the list of moves in standard chess notation, a small text describing the opening, and statistics on this opening in our database.

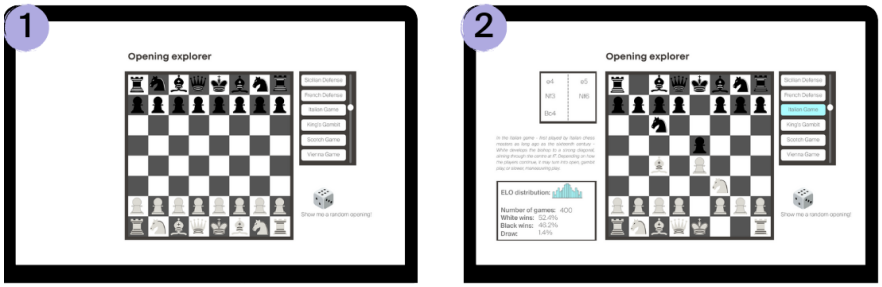

Figure 1: Opening explorer sketch, click here to see the images in full scale

We alredy have a basic visualization of a single opening in our website. Remains to be done:

- Process the data to get a list of all openings and their characteristics
- Implement the different visualisations for presenting the information (static)

2.3 Parallel Games Visualisation

For each piece, see all the 20'000 games (or a subset filtered by ELO) unfold before your eyes to get a sense of the different patterns that get played. Our idea is as follows:

1. Select a piece (black or white) to explore and an ELO (player level) range
2. Once a piece is selected, the user can either have a look at the animation of the different games unfolding in parallel or choose to go directly to the final positional heatmap
3. The animation of the game flows will allow the user to distinguish the different patterns of each piece for the games we have in our dataset.
4. At the end of the flow visualisation, we can observe a heat map of the final position of the selected piece. The user can choose to visualise the heat map for all, white-winning, black-winning or tie games.

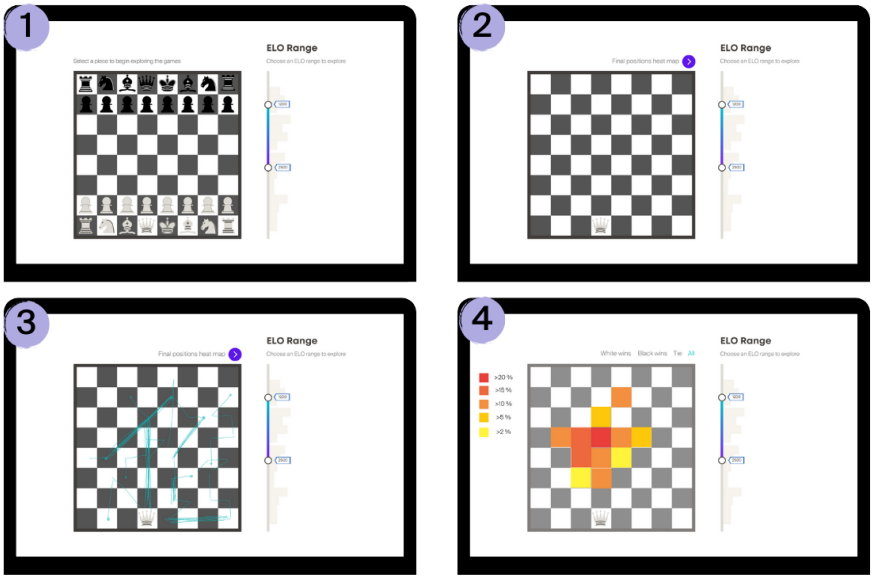

Figure 2: Game flows visualisation, click here to see the images in full scale

The different elements to implement for this part will be:

- Create the sliding ELO range selection with frequency histogram
- Create the flow arrows that simulate the pieces trajectories. We will need to pre-compute, for each of the 32 pieces in the game, the list of all moves in all the games, along with the game ELO. This visualisation might be the most challenging, we would like to see the flow evolve dynamically as all the games get 'simulated' at the same time, but if we don't succeed, we will show a static image of all the different flows.
- Create the heat map. This step will also need some pre-processing to

3 Extra Visualisations

3.1 Opening Explorer 2.0

Instead of selecting an opening and seeing it play by itself, we could also let the user move the pieces and inform them of what the current opening corresponds to, while showing various stats (inspiration).

3.2 Opening Explorer 3.0

Choose the desired properties of an opening, like median game duration, median ELO, mean win rate for black or white, times played, etc... (inspiration, visualization "match the taste").

3.3 General chess facts

Add some trivia information on chess such as: the top ten players in the world, the longest and shortest game ever played in competition, the number of possible positions, chess history, fun facts etc. We will need to create a data set for this task ourselves, but it should take a minimal effort as the number of facts we will display is small (< 10).

4 Lectures

For the chessboard, we have used lectures 4 and 5 about data joins. For the heatmaps, we will use 6 and 7 about colors and proper ways of visualizing things like this. For the piece flows, we were thinking of using lecture 9 about maps and using all the 2d curves and arrows. For the ELO slider, we will use the D3 range slider based on lecture 5 knowledge.