Chess piece position analysis

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1 What?

This project aims to visualise a relationship between the positions of various pieces and the players skill level. The positions of pieces, in states such as captured, capturing, or checking, can be easily represented using an `8x8` heat map. I also plan to present accompanying statistics utilising multi plots and histograms of events through out a game.

A key plot I aim to produce is a multi plot with ranking on x-axis and piece type on the y-axis. An example of this type of plot can be found here in the seaborn documentation.

2 Why?

The purpose of this project is to show the positional differences between different levels of play and over time. This is something not often visualised within the community thus I thought it would be a unique take on some common statistic.

3 How?

Throughout this project I have been utilising a number of libraries such as `numpy`, `matplotlib`, and `pandas` for general computation. Additionally I use the python-chess library to parse and interface with games on higher level.

For more general statistics I will adapt a `Chess.com` parsing script found here. An example of this script in action can be seen here.

4 Data source?

Chess games are found freely on the internet from many archives such as PGN Mentor. From here I am able to download thousands of games at mass. However as most games preserved will of famous players there will be significant bias. To help mitigate this I can use the public API's from Lichess and Chess.com to gather games from friends and players from various ELO's.

To pull games from Chess.com I use this shell command to gather the PGN files from individual months and write them to a single file as Chess.com does not support downloading of all games at once.

```
for g in $(curl -Ls https://api.chess.com/pub/player/$PLAYERNAME/games/archives | jq -rc
↪  ".archives[]") ; do curl -Ls "$g" | jq -rc ".games[].pgn" ; done >> games.pgn
```

Lichess easily allows for downloading of an entire players archive at once with a simple `curl`.

```
curl https://lichess.org/games/export/$PLAYERNAME > games.pgn
```

5 Examples

```
import chess
import chess.pgn
import chessHeatmap
```

```
pgn = chessHeatmap.load_pgn("Dae.pgn")

filename_pawn = chessHeatmap.lost_piece_plot(pgn, [chess.PAWN])
filename_pawn
```

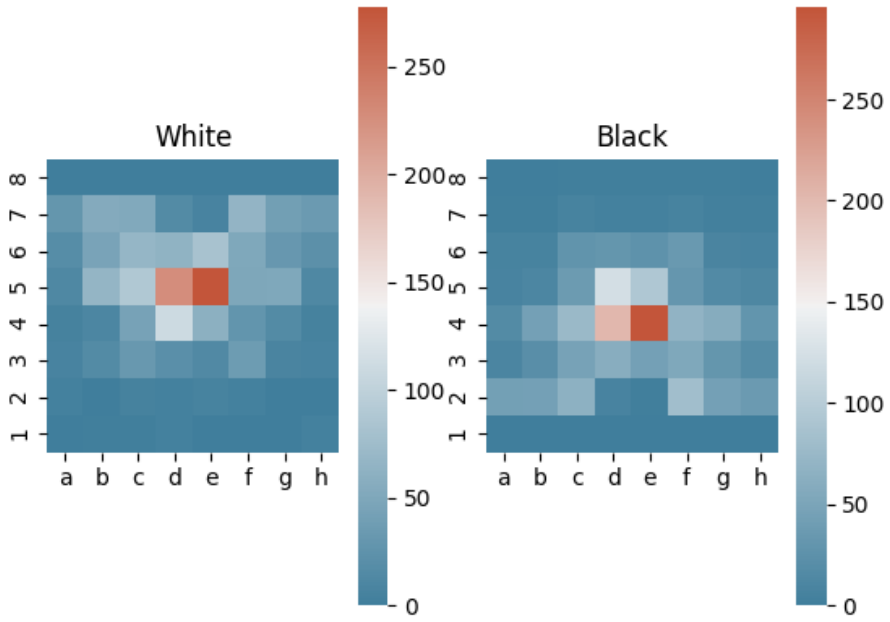

Figure 1: Pawns lost from whites POV

```
filename_knight = chessHeatmap.lost_piece_plot(pgn, [chess.KNIGHT])
filename_knight
```

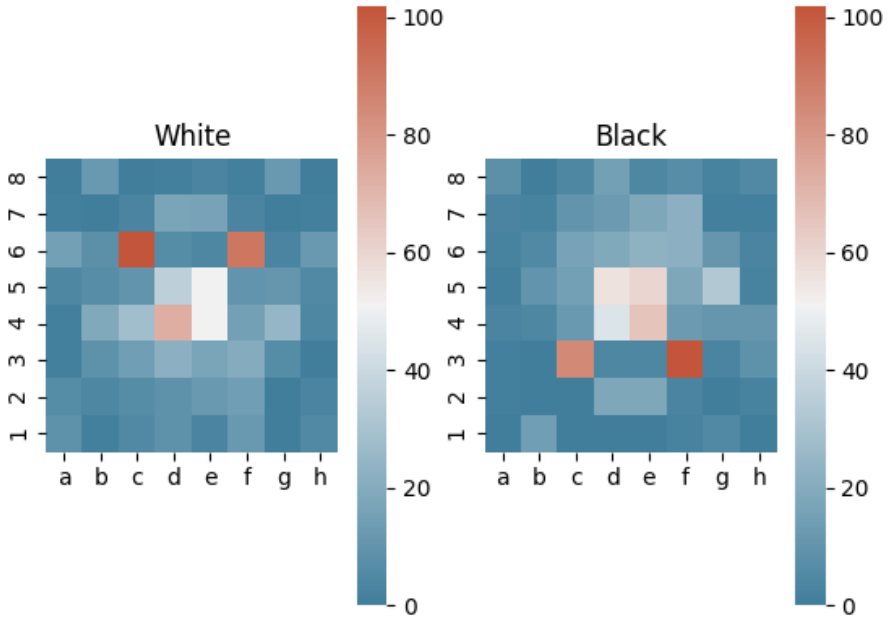

Figure 2: Knights lost from whites POV