

A black and white photograph of two chess knight pieces on a chessboard. The white knight is on the left, and the black knight is on the right. They are facing each other. The background is dark and out of focus.

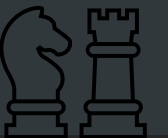
Chess Winner Prediction

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2021 DEC 16

Chess Winner Prediction

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Introduction

Imagine that we have a chess competition to prepare for and we need to find each player favorite opening move, to increase our chance of winning through data. The main goal of this data science research is to answer the following question:

Can I Predict the winner of a chess match using ML and past games dataset ?








Dataset

The dataset was obtained from Kaggle, it's rich in information which needs to be handled with first before performing nay modellings it contains 20,000 datapoints and 16 features.

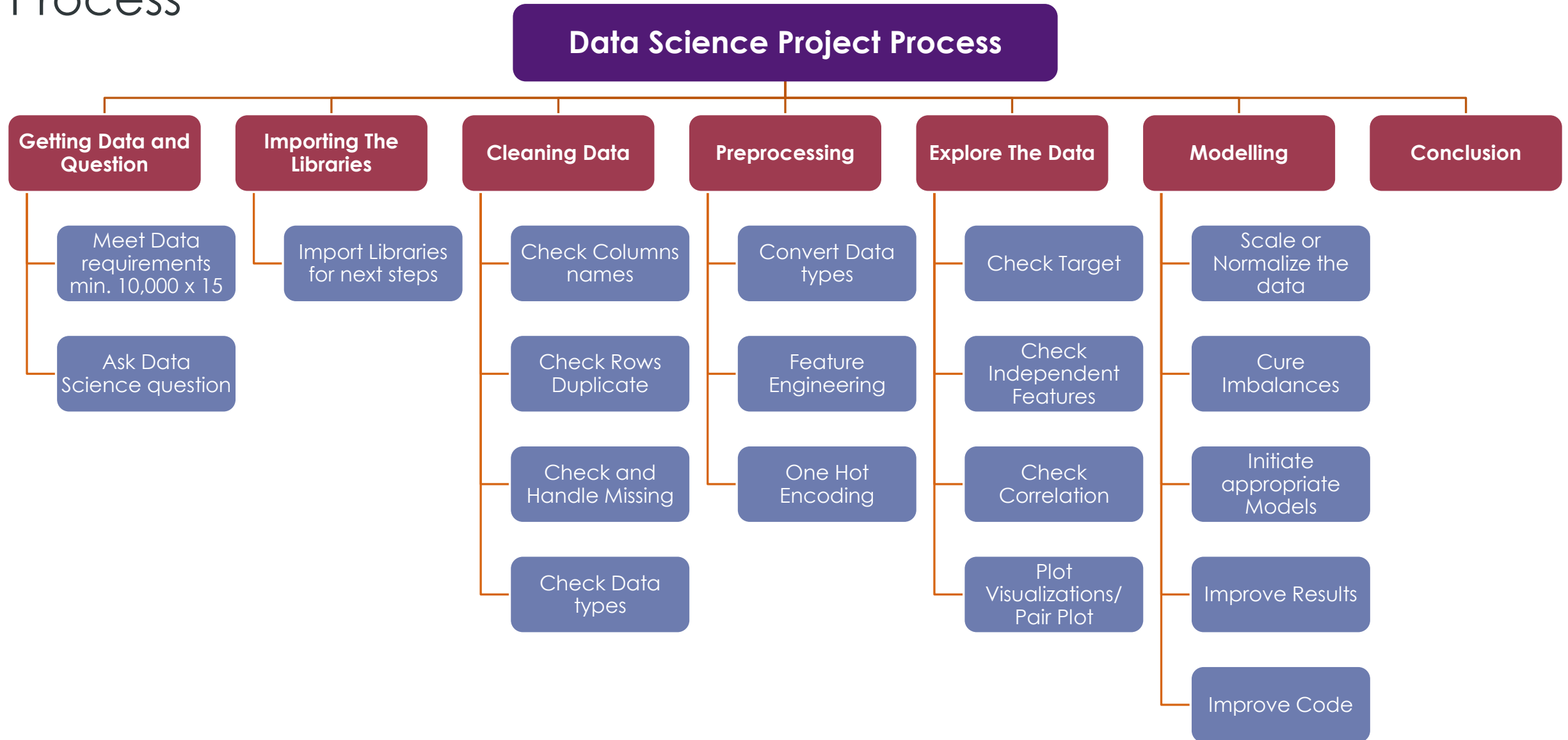
Data Feature	Description
Game ID	System generated game ID.
Rated (T/F)	Either the game is rated for points or casual
Start Time	start time of the game
End Time	end time of the game
Number of Turns	number of turns the game took
Game Status	game end status (mate, out of time, draw, resign)
Winner	White, Black or Draw
Time Increment	A fixed amount of time (in minutes) assigned at move 0 for the entire game, and increment (in seconds) is the Amount added after each move., more info increment methods
White Player ID	White player name
White Player Rating	White player level - the higher the more victories and experience
Black Player ID	Black player name
Black Player Rating	Black player level - the higher the more victories and experience
Moves	All Moves in Standard Chess Notation;
Opening Eco	Standard Code for opening moves
Opening Name	A set of moves in the beginning of the game which form into a move
Opening Ply	Number of moves in the opening phase which belongs to the opening moves

kaggle

Tools to be used

Programmin g Language	Data Handling Libraries	Modelling Libraries	Visualizations Libraries
 The Python logo, consisting of two interlocking snakes, one blue and one yellow, with the word "python" in a lowercase sans-serif font below it.	 The pandas logo, featuring a stylized bar chart icon with four bars of increasing height and the word "pandas" in a bold, lowercase sans-serif font.	 The XGBoost logo, with "XGBoost" in a blue, italicized sans-serif font.	 The matplotlib logo, featuring a circular icon with a multi-colored starburst and the word "matplotlib" in a blue, lowercase sans-serif font.
	 The NumPy logo, featuring a 3D cube icon made of smaller cubes and the word "NumPy" in a blue, bold, sans-serif font.	 The scikit-learn logo, featuring a blue circle and an orange circle, with the word "scikit" in a small font above the word "learn" in a black, lowercase sans-serif font.	 The seaborn logo, featuring a circular icon with a bar chart and the word "seaborn" in a blue, lowercase sans-serif font.

Process



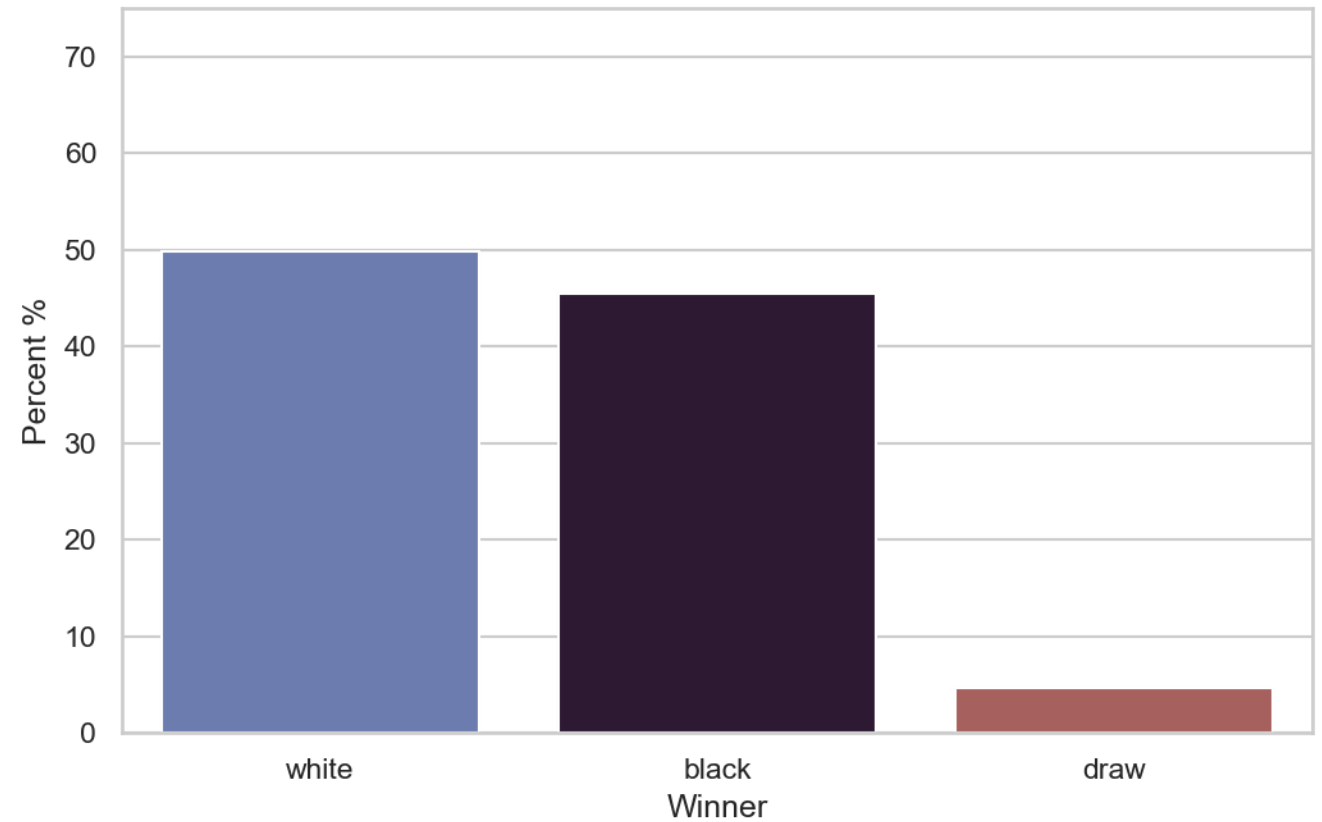
Cleaning Data

- ✓ 400 + Duplicated data records
- ✓ Converted timestamp feature(created_at, last_move_at) which was in Unix format
- ✓ Decode increment_code column
- ✓ Shorten opening names which had many sub variations
- ✓ Extracted rating difference for each game
- ✓ Categorized games based on rating average.

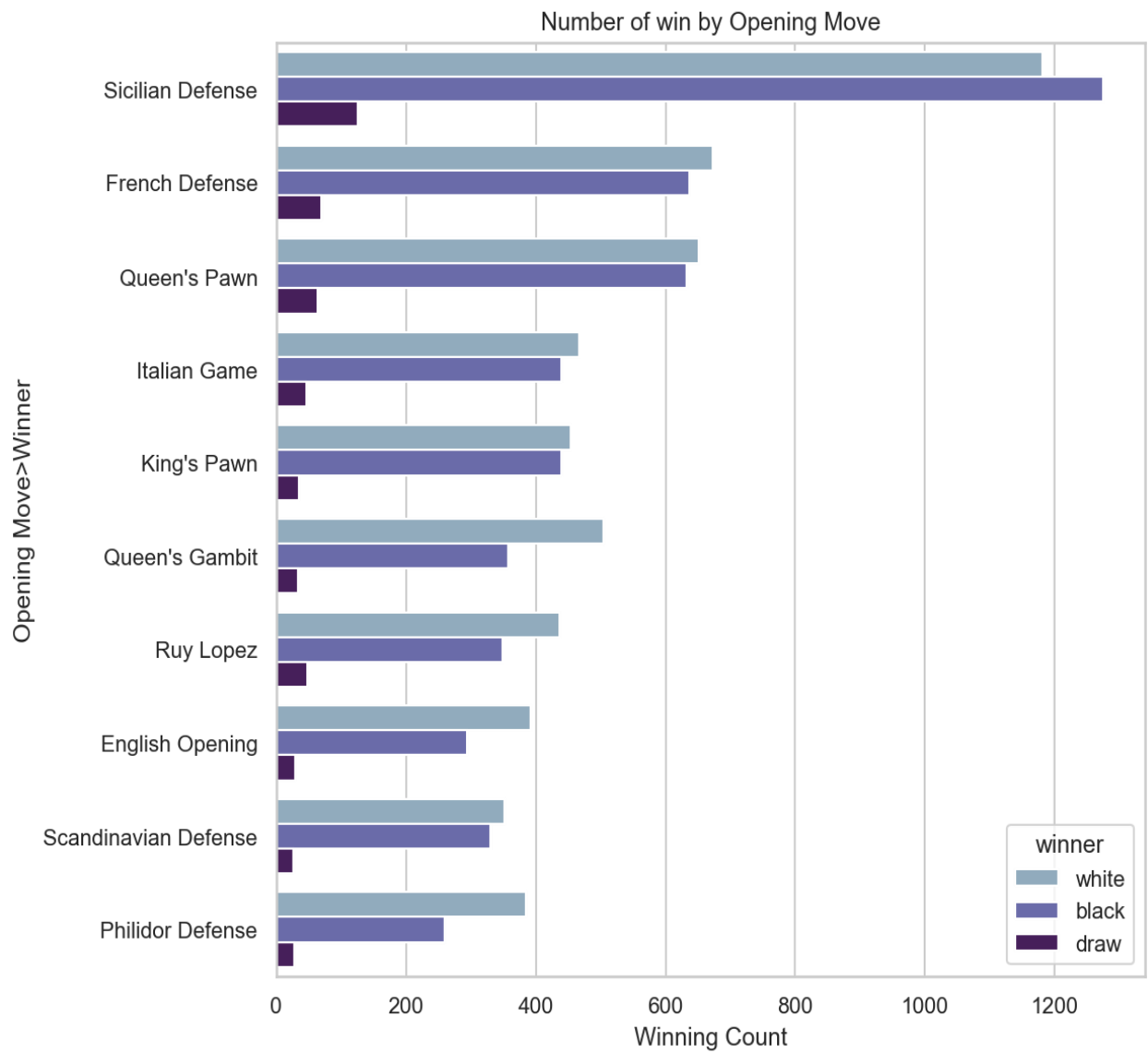
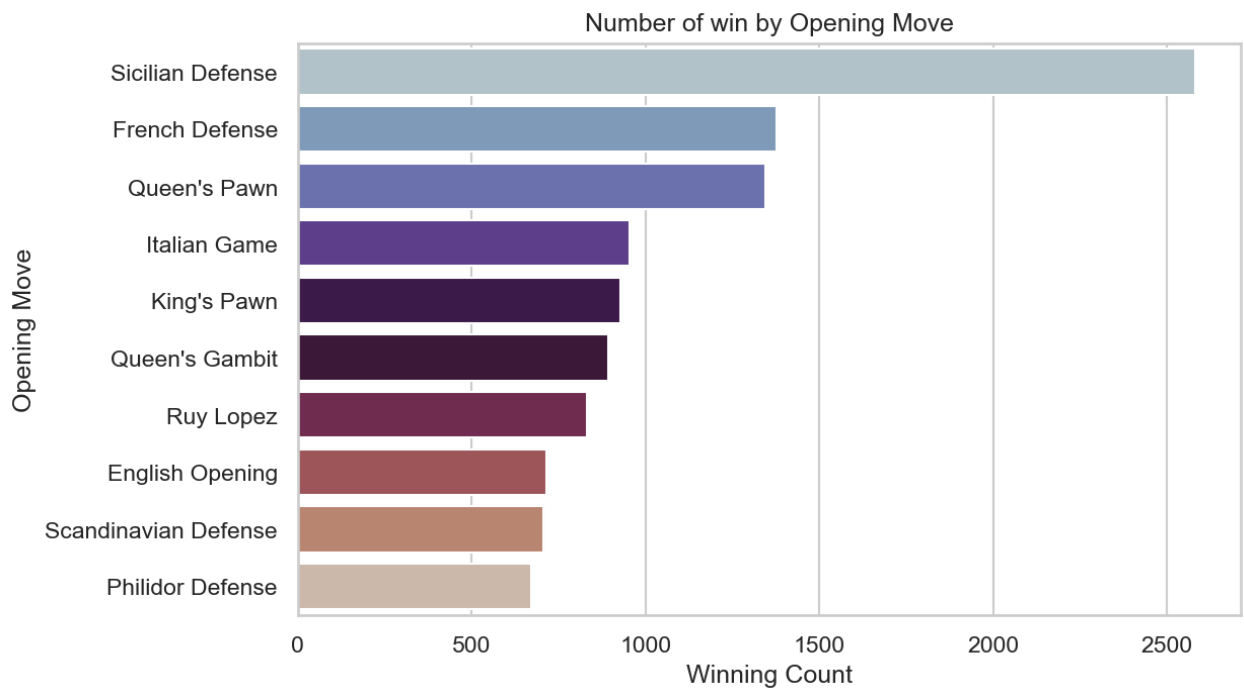
Target data

The fight between white and black is a close call , white edges a little bit.

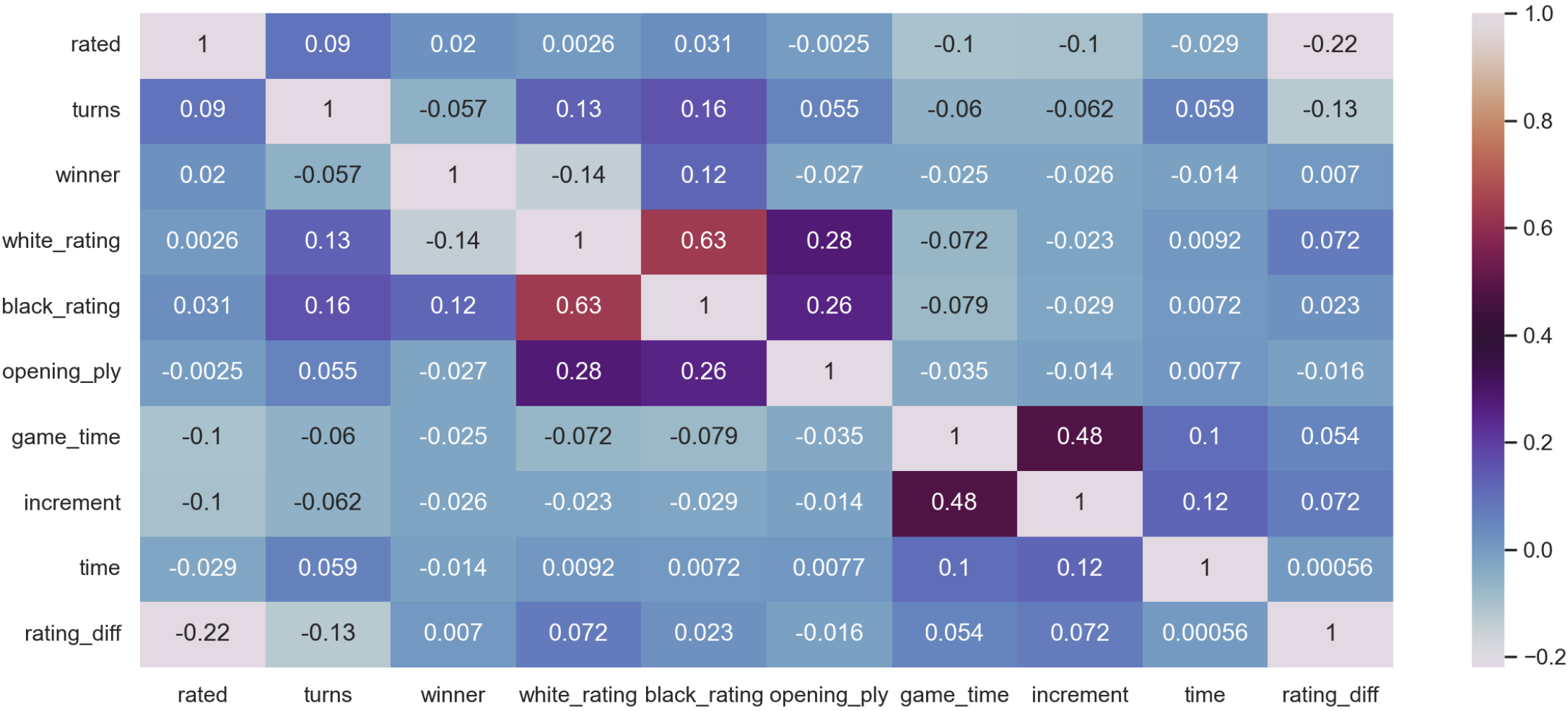
This a multi-classification problem



Opening moves data



Features Correlation Heatmap

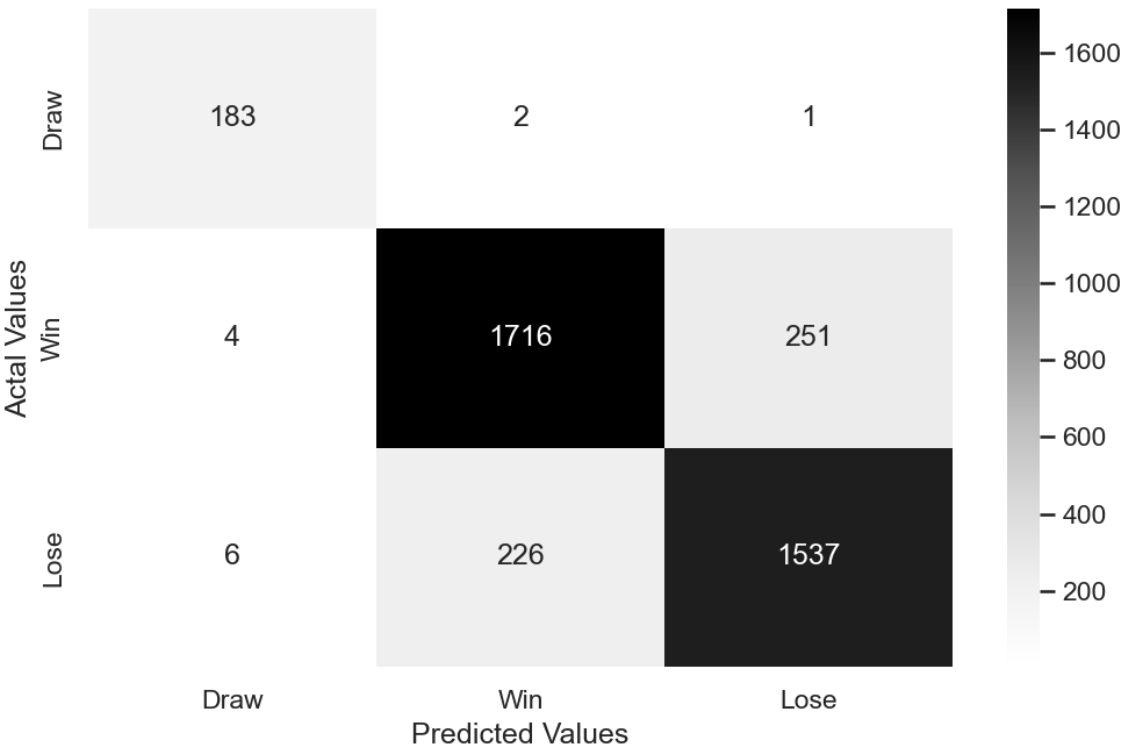


Scorings

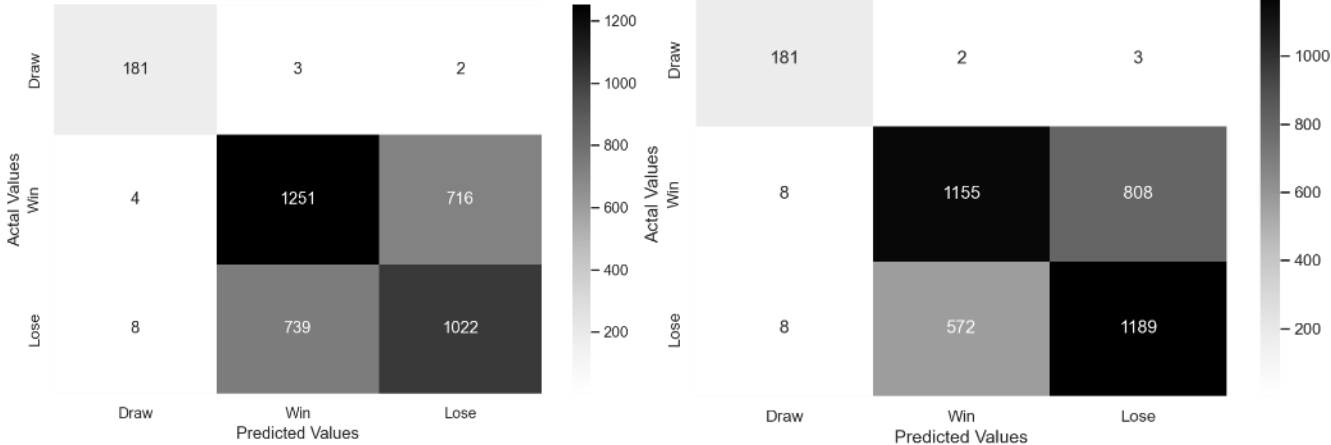
MODELS	ACCURACY SCORE	F1 SCORE
Logistic Regression	0.665053	0.664628
Random Forest	0.67244	0.672021
XGBoost	0.875191	0.875144
SVM	0.643148	0.642504
KNN	0.625064	0.624595

Confusion Matrix

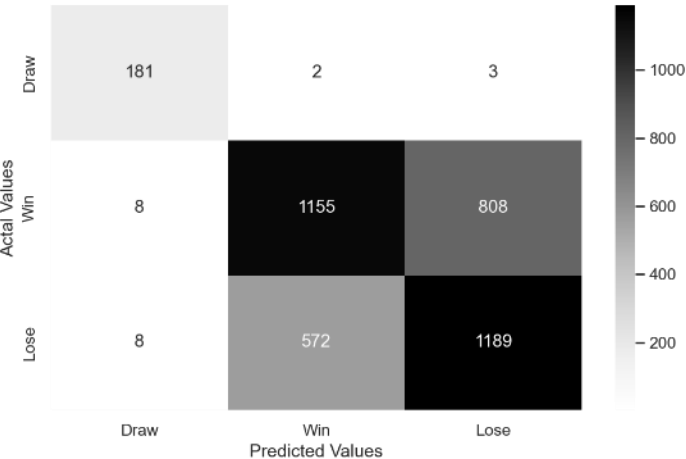
XGBoost Confusion Matrix



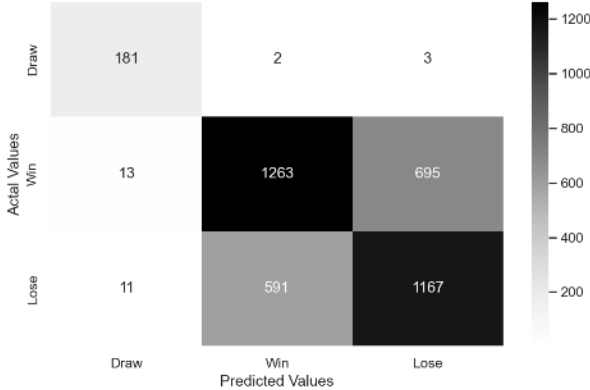
KNN Confusion Matrix



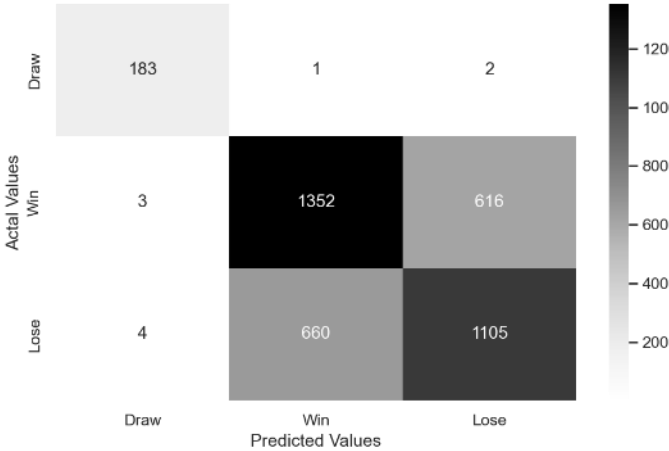
SVM Confusion Matrix



Logistic Regression Confusion Matrix

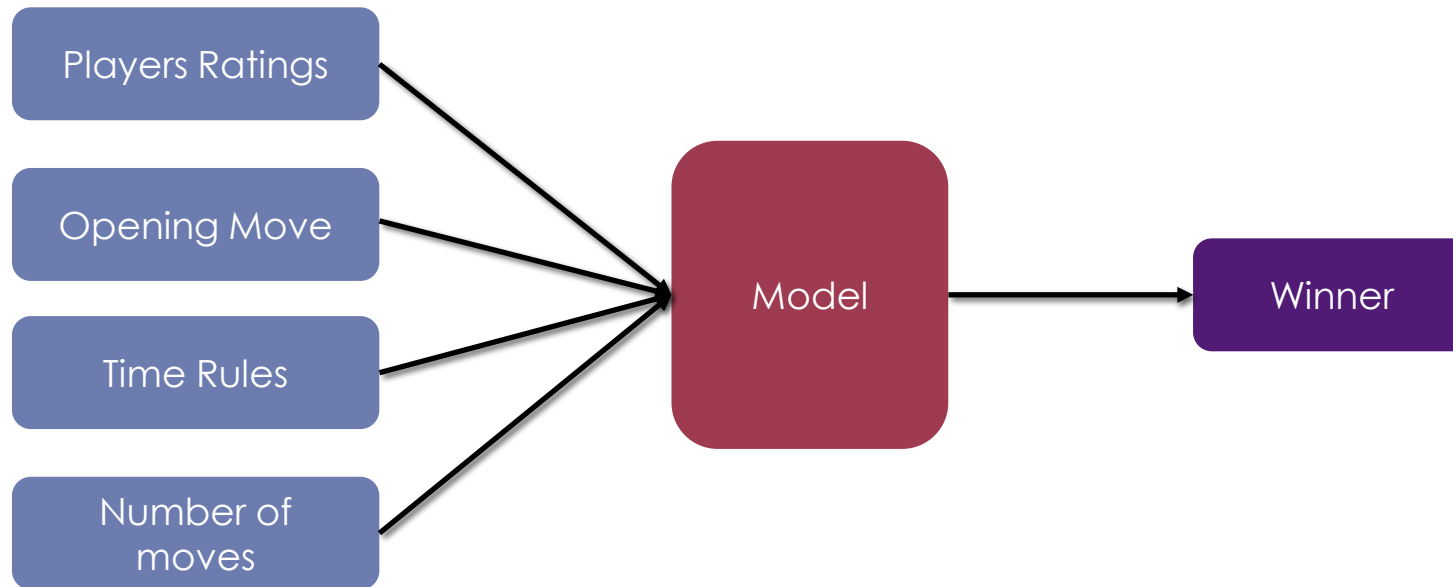


Random Forest Confusion Matrix



Future Direction

- Connect the model with the original lichess.org API to be updated with realtime data.
- Deploy to production on a webapp using Flask.
- Apply the model on different sport games.
- Upgrade the model to including detailed movement analysis using on Neural Network models.



Thank you

Any Questions?

