



# Chess.com Classification

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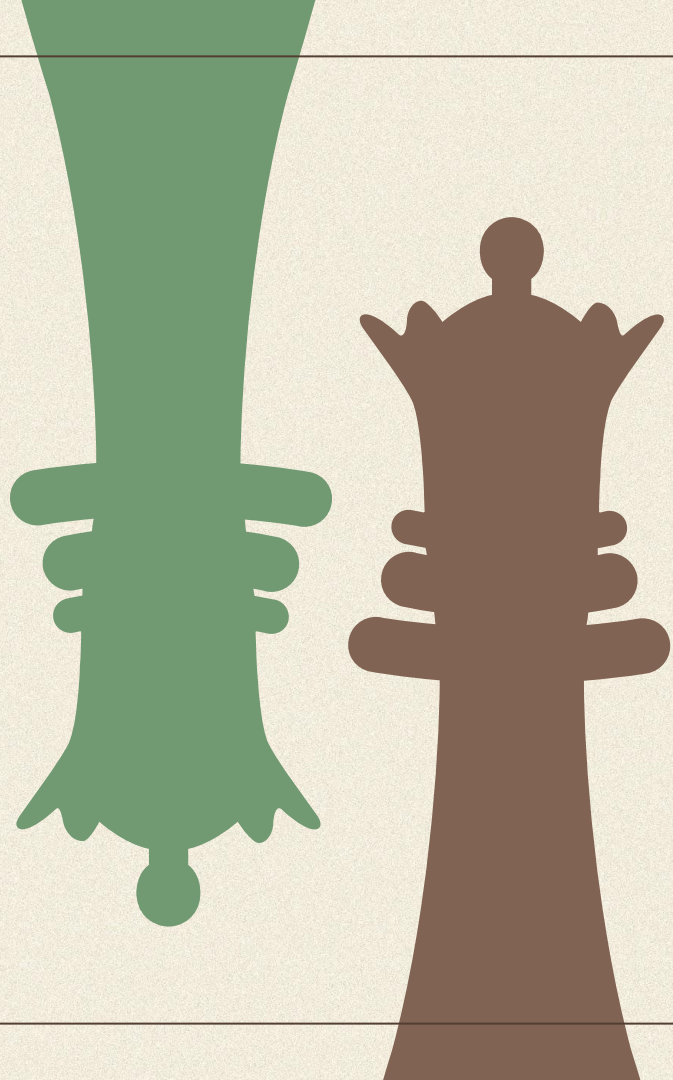
**02** Data & Cleaning

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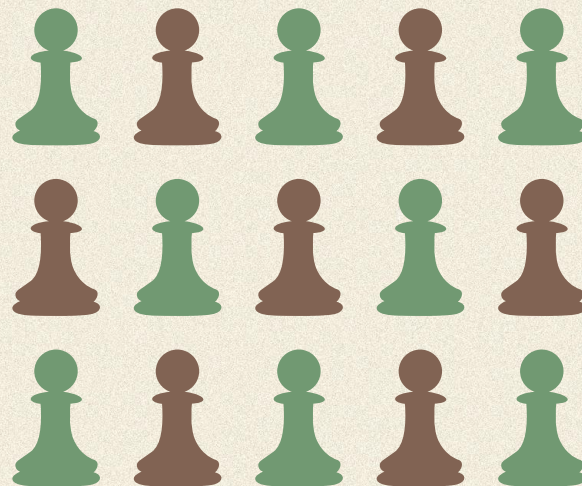
# 01

Problem  
Overview



# Problem Overview

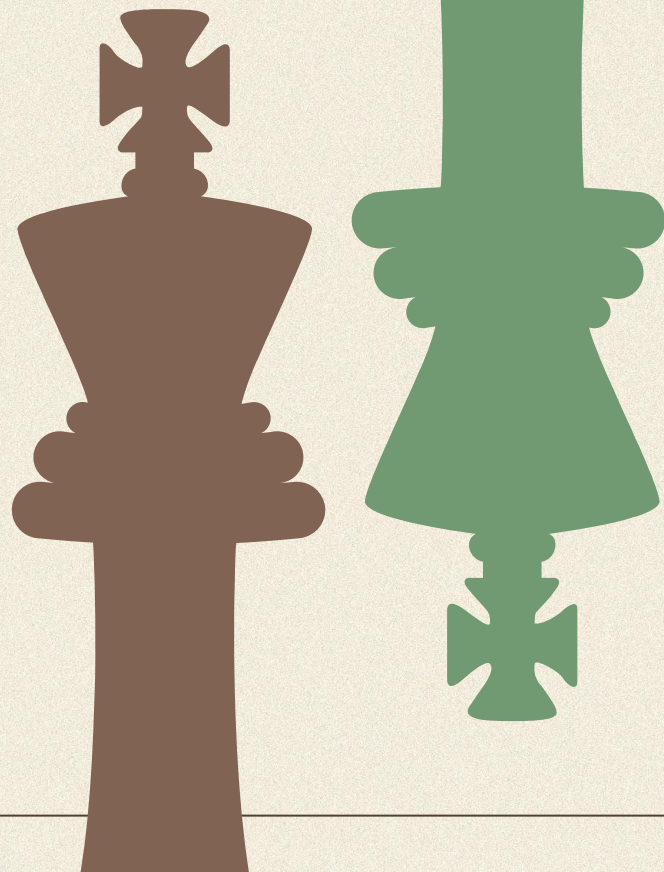
Chess is a classic game and lots of fun. The goal of this project is to classify a game as a win or a loss based on player statistics.





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Data







# Data

Well, actually...



## Games

All historical games from  
streamer archives




## Streamers

Normally dist ratings  
Lots of playtime



## Features/Player

Game Type Stats  
Lessons  
Puzzles







# Data Subset for Modeling

30K



Games

Randomly sampled with  
binned streamer subset

13K



Players



Created pipeline to gather all  
opponent statistics (not all  
opponents were streamers)

20

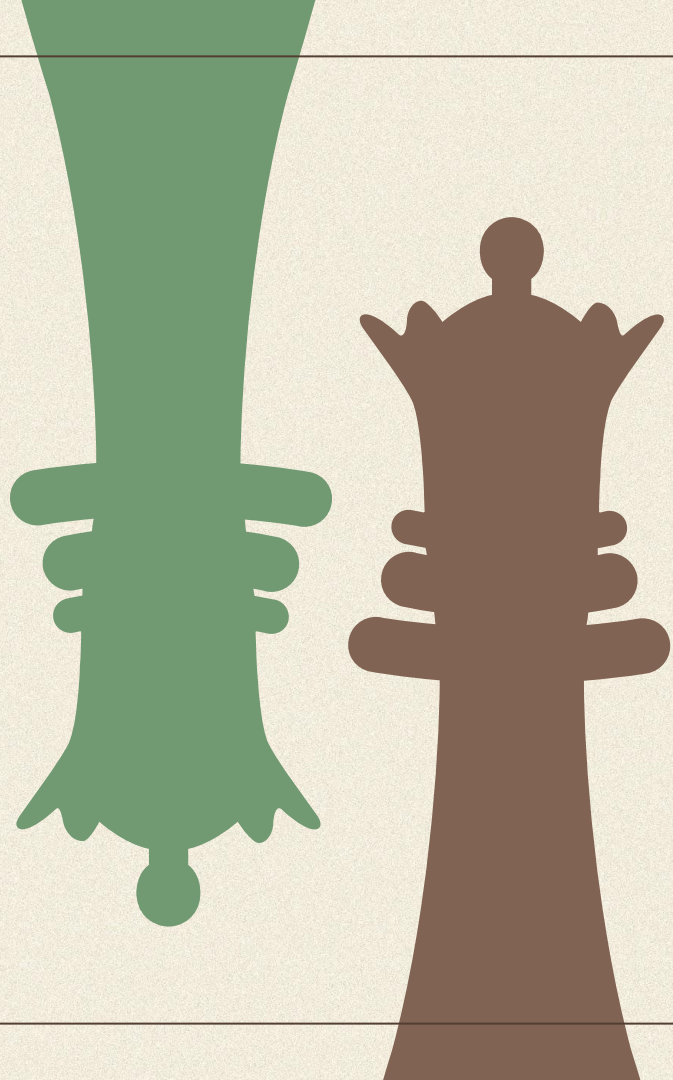


Features/Player

Game Type Stats  
Lessons  
Puzzles







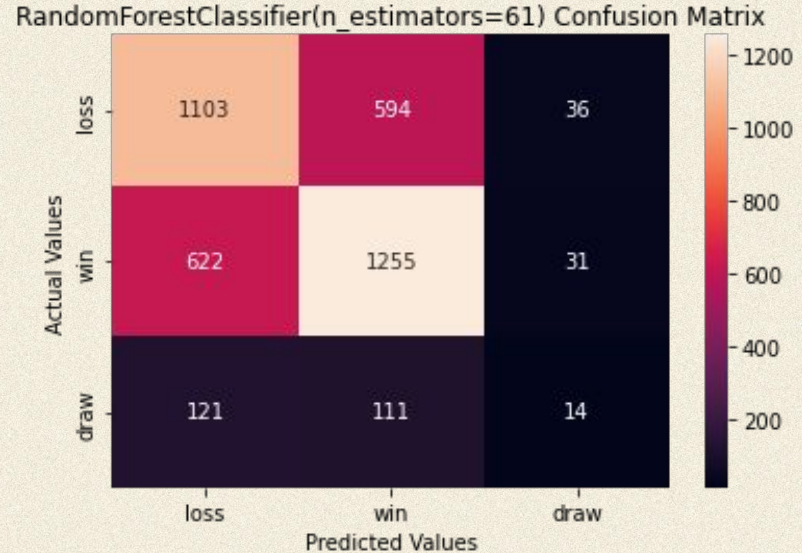
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Modeling



# Modeling – Class Imbalance Issue

- Draw class is rare
- ~0.03% Draw Pred Accuracy
- Solutions Tested on 5 Models:
  - Overbalanced Sampling
  - SMOTE Sampling
  - Class Weight Changes
- Results:
  - More Draw predictions
  - Drop in accuracy and F1





A decorative border surrounds the central text. It features a light beige background with a thin dark brown rectangular frame. At the corners are dark brown diamonds. Along the sides are stylized chess pieces: green pawns on the left and right, and brown rooks on the top and bottom.

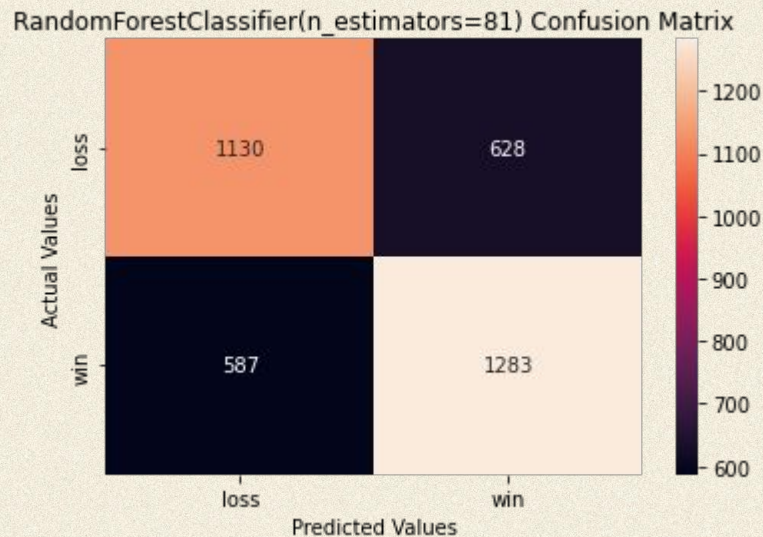
"Draws are boring."

— Me



# Modeling – Updated Classes

- Removed ~4% of data when removing draws
- New classes: win or loss





# Rating Only – Base Model Choices



**KNN**

Accuracy: 0.69

F1 Value: 0.69



**Random Forest**

Accuracy: 0.66

F1 Value: 0.66



**Logistic Reg**

Accuracy: 0.70

F1 Value: 0.70



**Decision Trees**

Accuracy: 0.65

F1 Value: 0.65



**XGBoost**

Accuracy: 0.58

F1 Value: 0.65







# Model Engineering

## Feature Engineering

- Categorical Features
  - Time Class
  - Rules
  - Game Type
- Date since best rating
- Win %
- Current rating/best rating

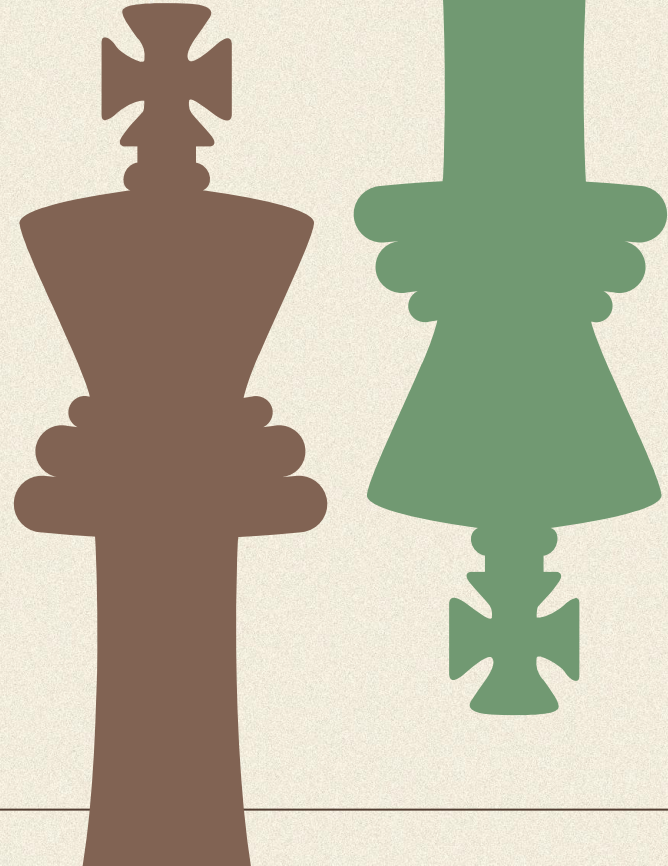
## Model Tuning

- GridSearchCV
  - Hyperparameters
    - C
    - Solver
    - Cost Function
- 
- 



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Results





# Final Model

## Metrics

Accuracy

0.7

F1 Score

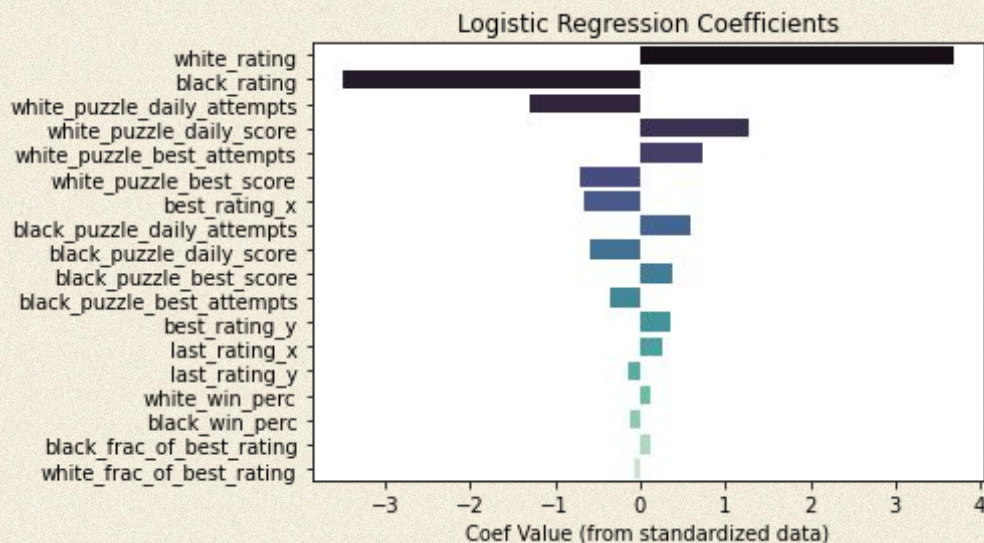
0.73

Confusion Matrix





# Top Features



Glicko Rating



Puzzle Stats



Best Rating



# Example Game



GAME:

Chess Rules

TYPE:

Chess Blitz

TIME CONTROL:

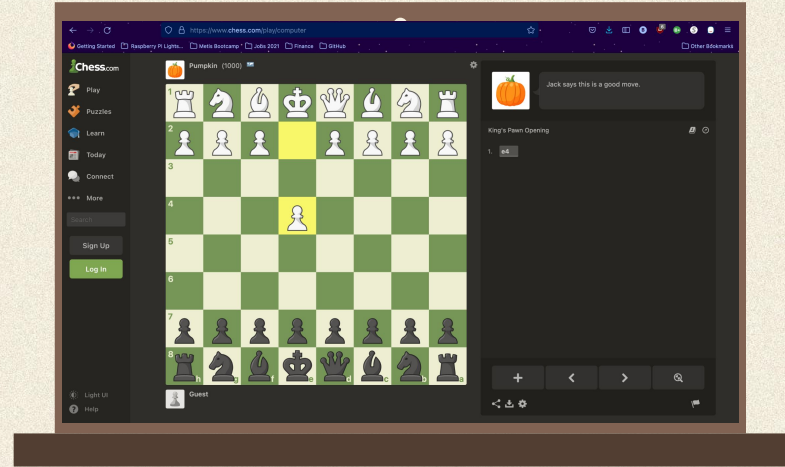
3 Minutes

	PLAYER	Rating	Puzzle Attempts	Pred / Prob	RESULT
WHITE:	Josiwales (streamer)	2621	57	Win (61.2%)	WIN
BLACK:	Agent-JL	2560	63	Loss (38.8%)	LOSS



# Conclusion

- Logistic Regression Model worked best
- Glicko Ratings difficult features to outperform
- Future Work
  - Design more advanced feature
  - NLP to analyze gameplay
  - More Data
  - Spark







# THANKS

## QUESTIONS?

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