CHESS

Team 6
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SUPERVISED

Classification In a new match between two players, who is most likely to win?
Regression Can a player's rating be determined from a single match record with another player?

LIST OF MOVES

01
DATA INSPECTION
Data Types, Anomalies, Features and Labels

02
DATA PREPARATION
Anomalies Handling, Feature Engineering, Train/Test Splits

03
FEATURE SELECTION
Spark Vectors

04
MODEL SELECTION
Decision Tree, Logistic Regression, Linear Regression

05
MODEL EVALUATION
Metric

06
PROJECT OUTLOOK
Improvements

DATA INSPECTION: OVERVIEW

Categorical

opening eco
opening name
moves
black id
winner
rated id
white id
victory status
increment code

Numerical

opening ply
turns
white rating
last move at
created at
black rating

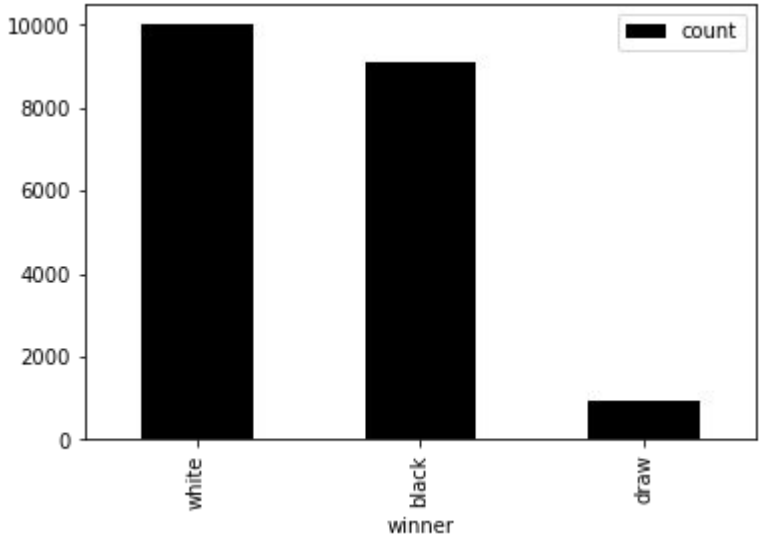
Labels

* Classification:
  target
* Regression:
  black_rating

Anomalies

* Duplicate Rows
* No Missing Values

DATA INSPECTION: LABELS



summary	black_rating	white_rating	rating_diff
count	20058.00	20058.00	20058.00
mean	1588.83	1596.63	-7.80
stddev	291.04	291.25	249.04
min	789.00	784.00	-1499.00
max	2723.00	2700.00	1605.00

DATA PREPARATION

WORD2VEC

`moves`

'e4 c6 Nc3 d5 Nf3 Bg4 h3 Bh5 exd5 cxd5 Bb5+ Nc6'
→ [0.1149, 0.0761, 0.019, ..., -0.056, 0.0682, 0.0676]

ENCODE TO NUMERICAL

`winner`

'draw' → 2.0
'white' → 0.0
'black' → 1.0

`white_id, black_id`

'konst767' → 0
'ducksandcats' → 1
'everybodylovesjesus' → 2

EXTRACT

`increment_code`

'30+25' → 30, 25
'10+0' → 10, 0

`opening_eco`

'B11' → 'B' → 1.0
'C60' → 'C' → 0.0
'D10' → 'D' → 3.0
'A00' → 'A' → 2.0
'E91' → 'E' → 4.0

ONE-HOT ENCODE

`victory_status`

'resign' → 0.0 → SparseVector(4, {0: 1.0}))

RECAP

CHESS

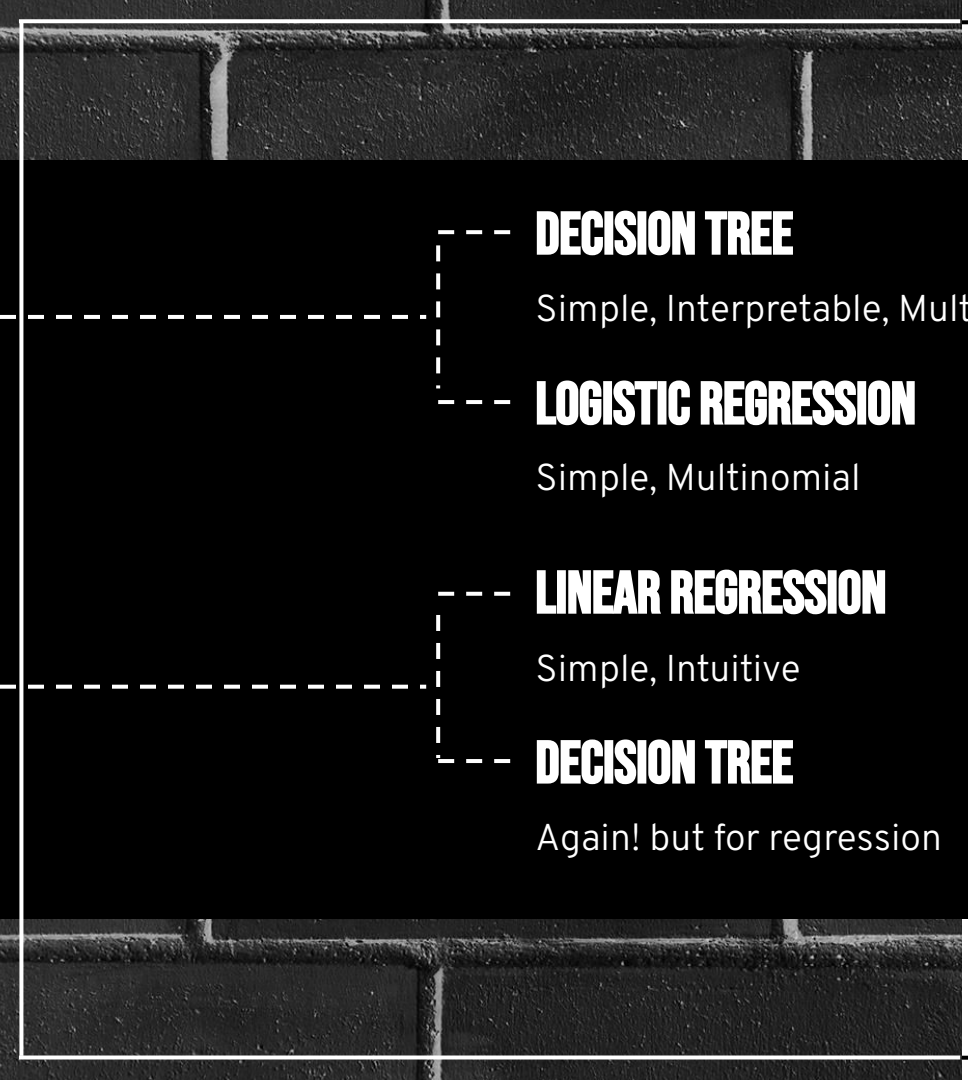
20,000+ Lichess Games, including moves, victor, rating, opening details

CLASSIFICATION

Predict winner given a match record

REGRESSION

Predict rating of one player



DECISION TREE

Simple, Interpretable, Multiclass

LOGISTIC REGRESSION

Simple, Multinomial

LINEAR REGRESSION

Simple, Intuitive

DECISION TREE

Again! but for regression

MODEL SELECTION

MODEL EVALUATION

F1 SCORES

Decision Tree CLF

Train 0.70613

Test 0.67201

Logistic Regression

Train 0.76362

Test 0.74706

Decision Tree REG

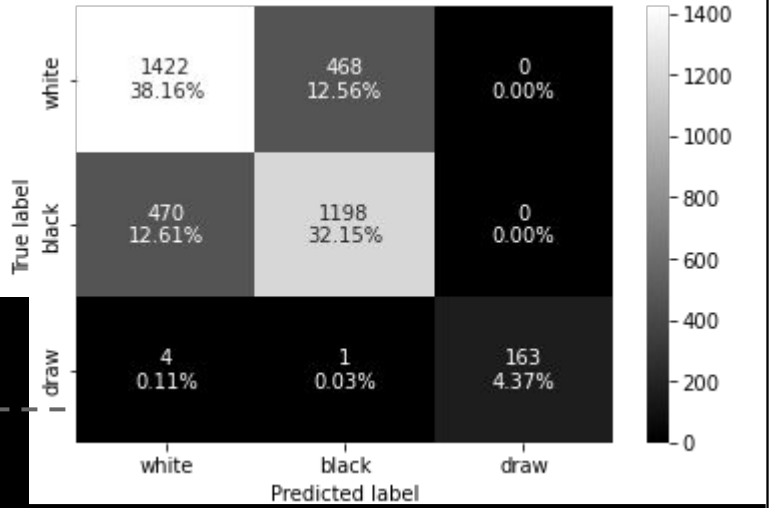
Train RMSE 259.35

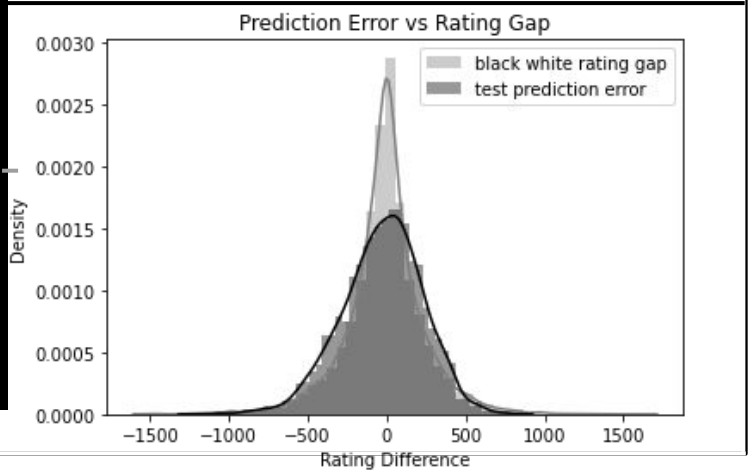
Test RMSE 275.86

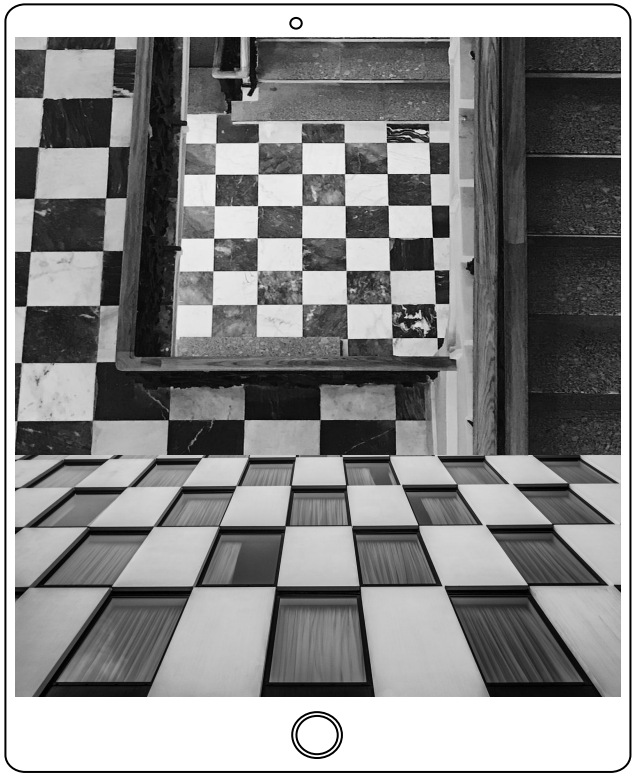
Linear Regression

Train RMSE 250.66

Test RMSE 258.24







PROJECT OUTLOOK

WAYS TO IMPROVE

- Use more robust models like Random Forest
- Leverage Lichess API and Spark ML Pipelines to build an end-to-end system
- Apply model to more data from Lichess

LEARNINGS

- Attempted Supervised Learning Problems
- Explored Spark API for ML
- Explored how to preprocess sequence data

THANKS

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