Player Valuation

Modelling European football player valuation

https://github.com/MarcoWong96/Capstone-Project.git

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“Doing a Leeds”

PROBLEM

In football's hyper competitive world, clubs face significant financial risks due to inaccurate player valuations.

SOLUTION

1. Utilize last season's player statistics to accurately determine player valuations.

2. Find which features are most predictive of valuations

Impact

Value Appreciation

Improve Fan Relations

Compliance Assurance

Long Term Sustanability

Financial Stability

Marketing Opportunities

Datasets

Player Statistics

2022 – 2023 Season
2921 rows x 143 columns

2021 – 2022 Season
2689 rows x 124 columns

Player Valuation

Transfermarkt

Player Valuation
440643 rows x 9 columns

Players
30302 rows x 23 columns

Proposed Solution:

Player X

Age:
Team:
Height:
Matches Played:
Passes Completed:
Goal Creating Actions:
Aerial Won%:

→ **€ X mil**

Player X

Player Statistics

Name	Age	Team	Matches	Passes Completed
X	20	MUN	180	690

Player Valuation

Player ID	Year	Valuation
121	2022	1,000,000

Player Name

Player ID	Player Name
121	X

Player X

Player Statistics

Name	Age	Team	Matches	Passes Completed
X	20	MUN	180	690

Player Name & Valuation Merged (On Player ID)

Player Name	Year	Valuation	Player ID
X	2022	1,000,000	121

Player X

Final Dataframe *(5422 rows × 128 columns)*

Name	Age	Team	Matches	Passes Completed	Valuation
X	20	MUN	180	690	1,000,000

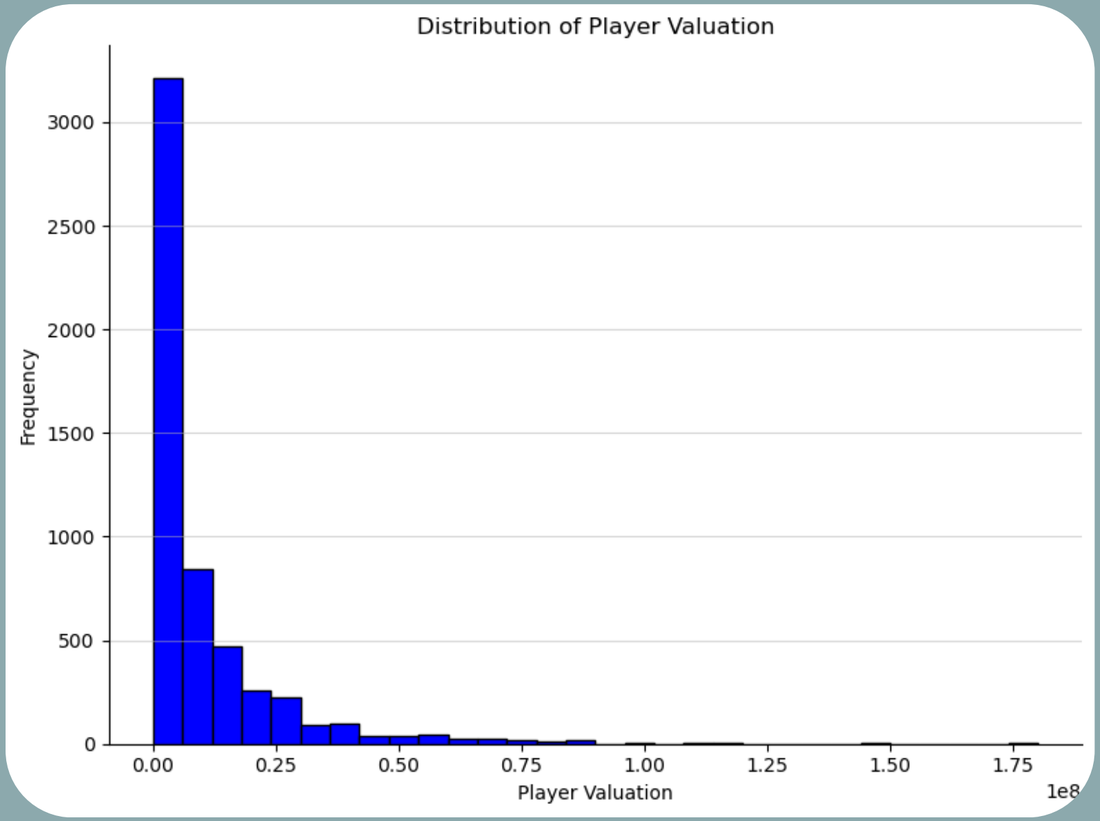
Name

Features

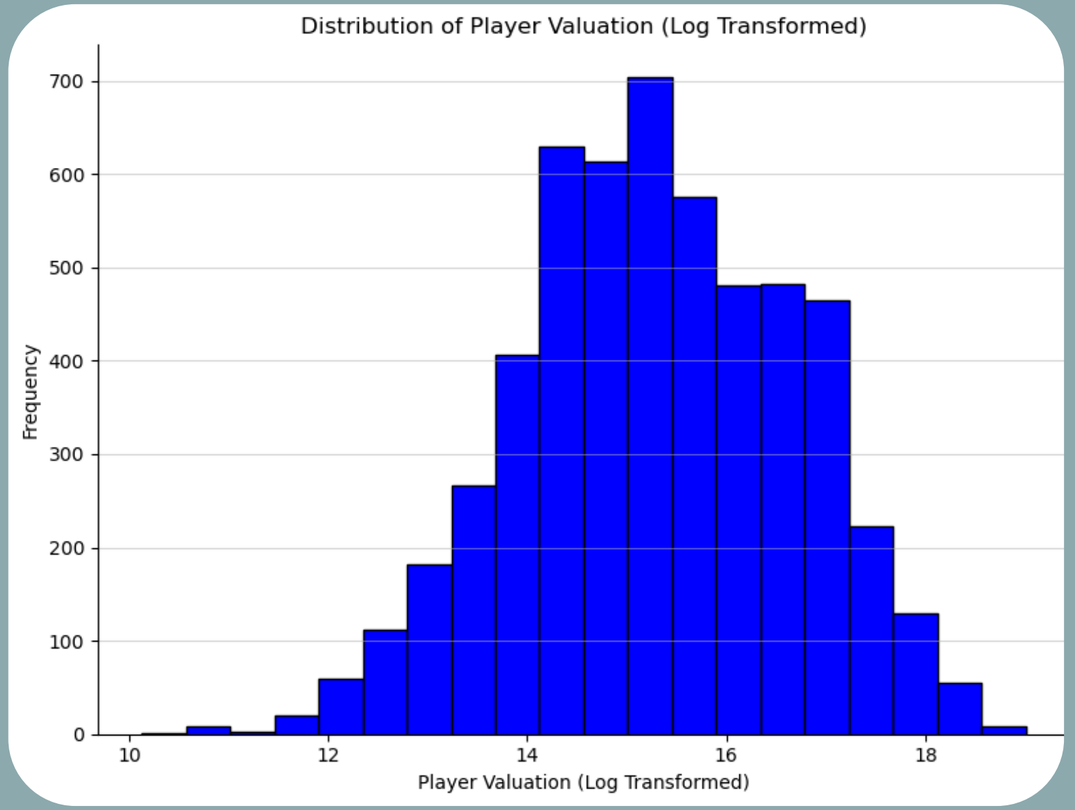
Target (Valuation)

EDA

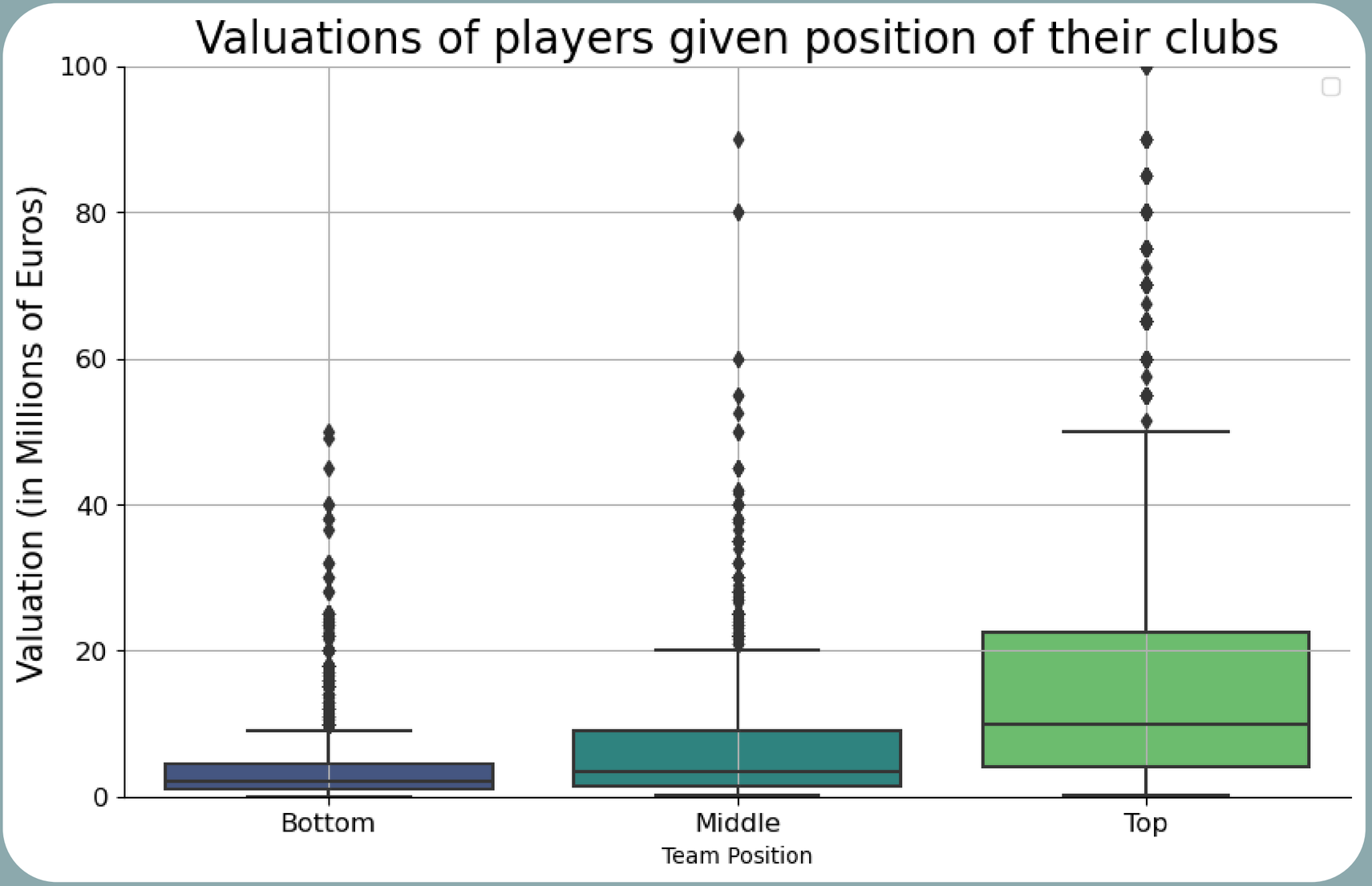
Original Valuation



Log Transformed



FURTHER EDA (Nations)



- Players in top teams have higher mean, median valuation
- Players in top teams have more high valuation outliers
- Anova Test:
  P value: 0.00

Data Modeling

Linear Regression (Baseline)

Decision Tree

Random Forest

Neural Network

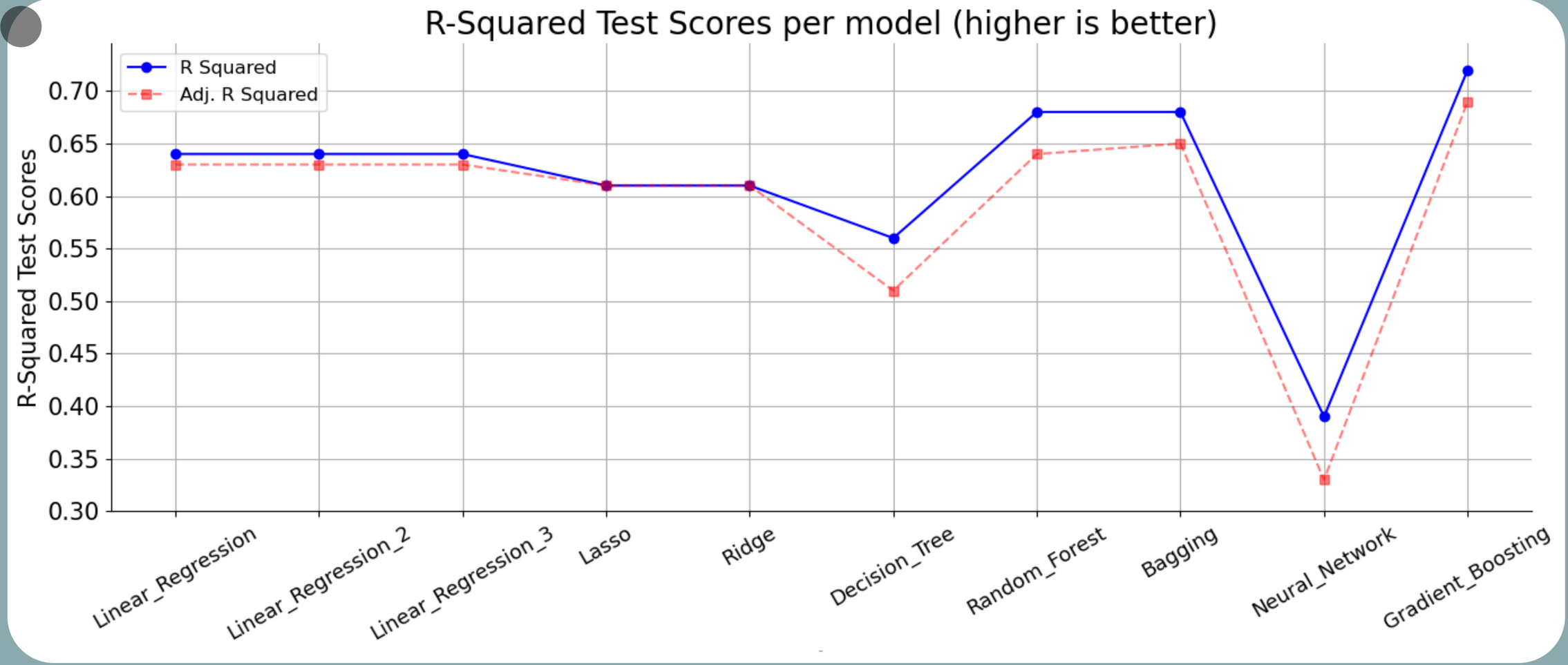
Bagging

Gradient Boosting

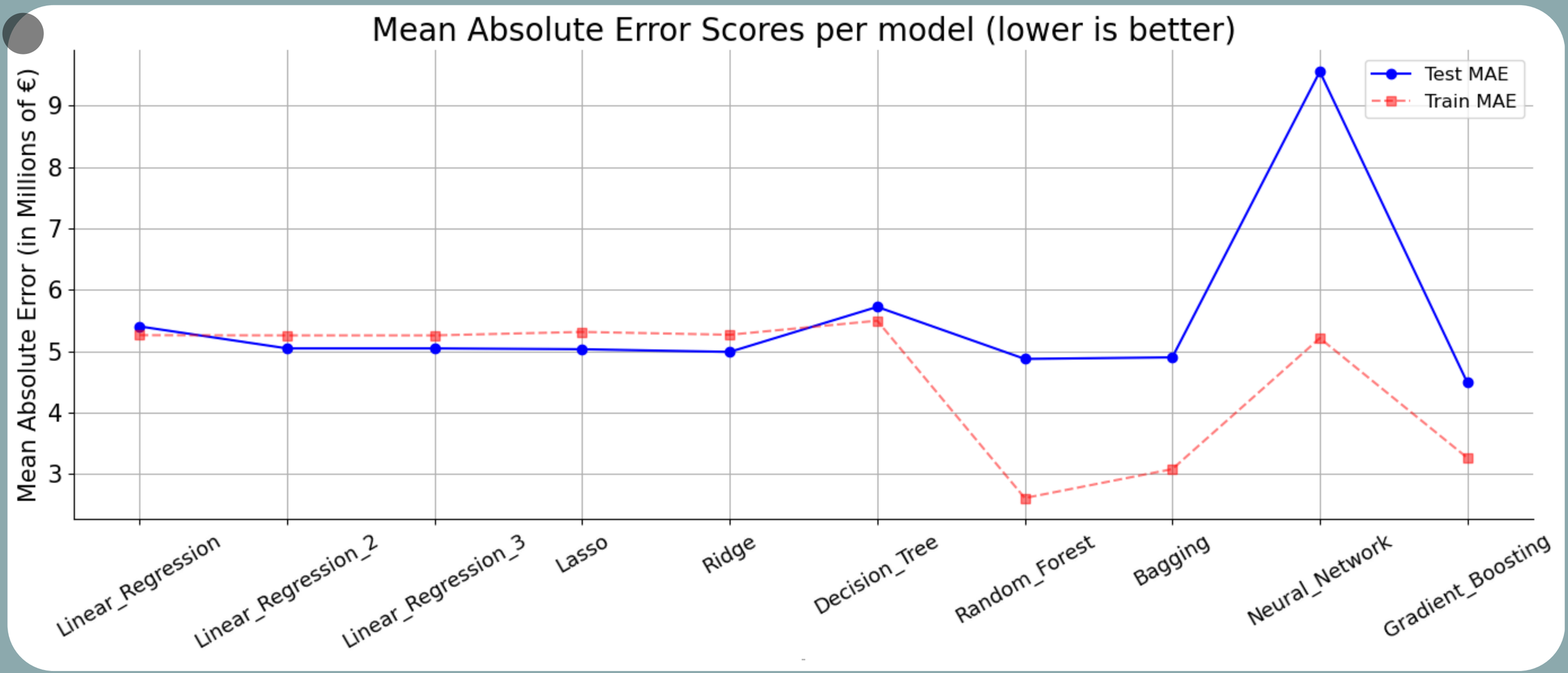
Model Evaluation

- ↑ R Squared
- ↑ Adj R Squared
- ↓ Mean Absolute Error (MAE)
- ↓ Percentage Mean Absolute Error (PMAE)

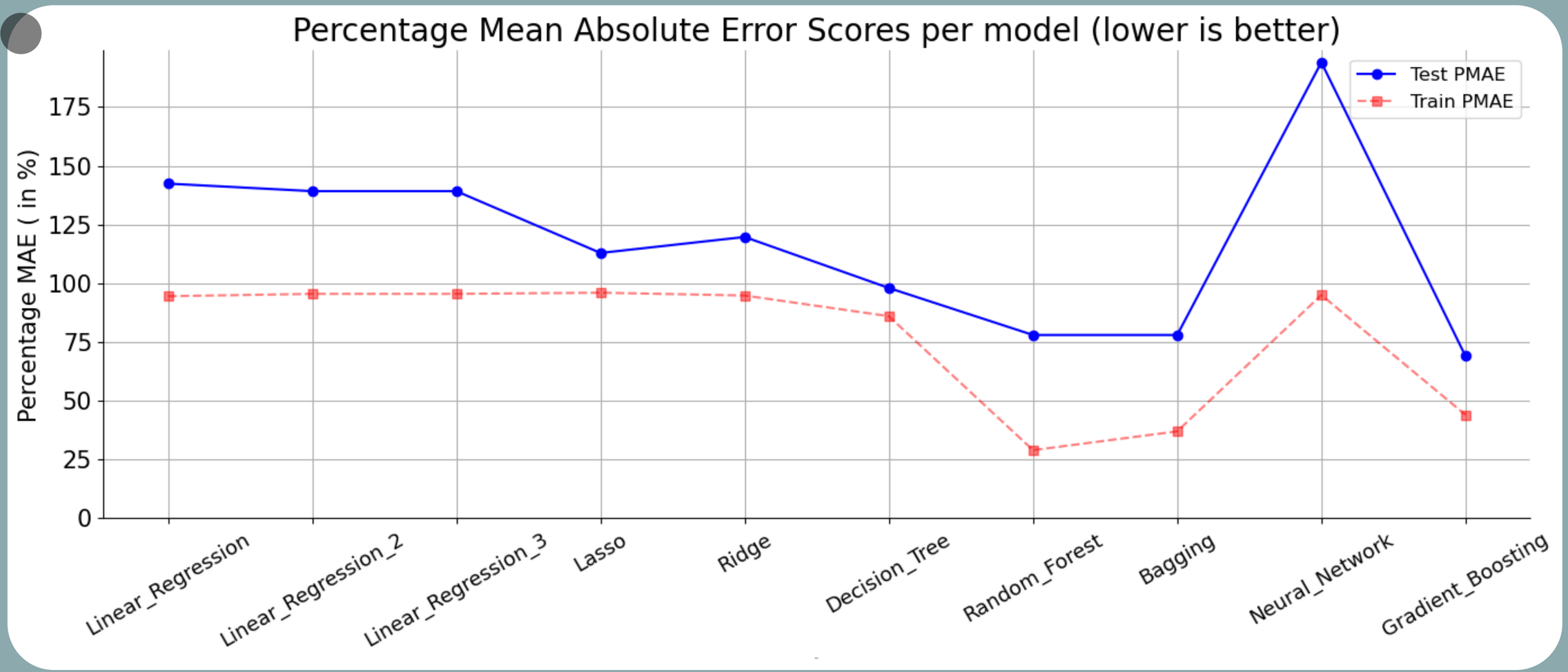
R Squared


R-Squared Test Scores per model (higher is better)
R Squared
Adj. R Squared
R-Squared Test Scores
0.70
0.65
0.60
0.55
0.50
0.45
0.40
0.35
0.30
Linear_Regression
Linear_Regression_2
Linear_Regression_3
Lasso
Ridge
Decision_Tree
Random_Forest
Bagging
Neural_Network
Gradient_Boosting

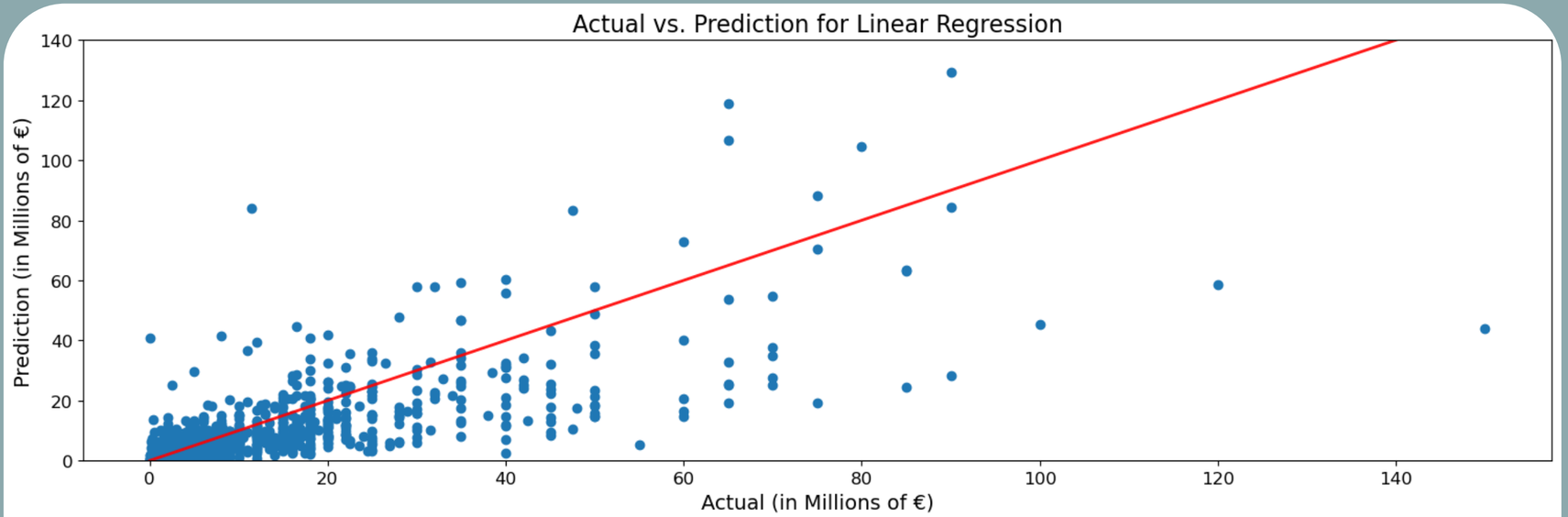
Mean Absolute Error

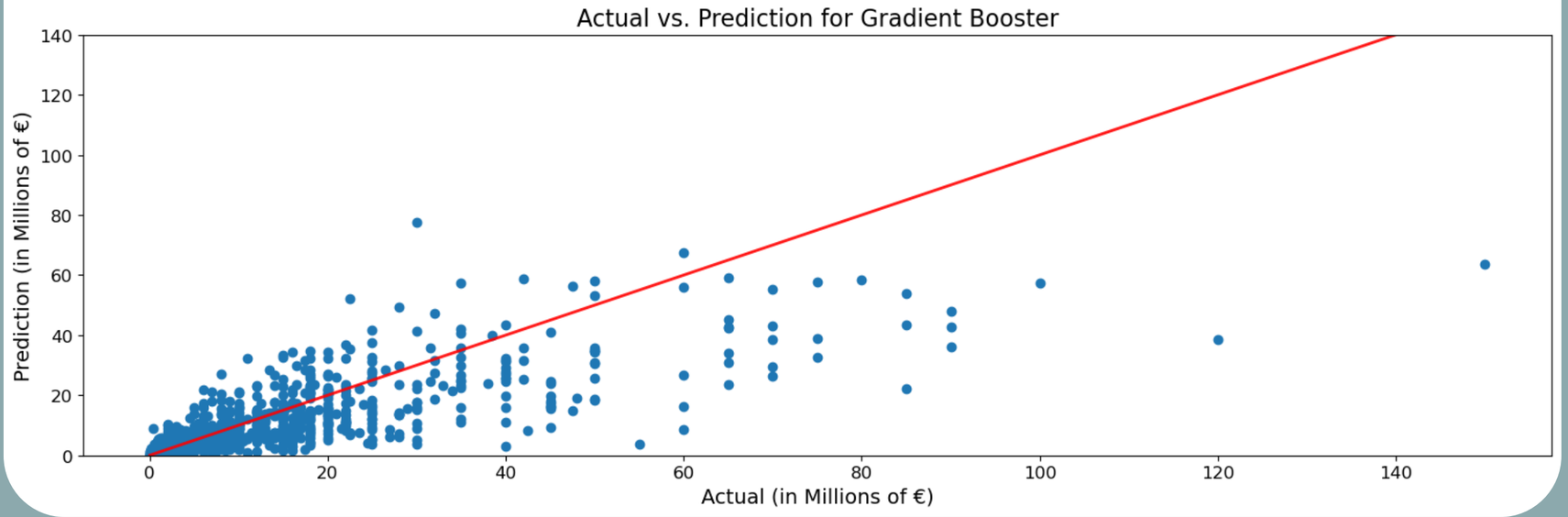


% Mean Absolute Error



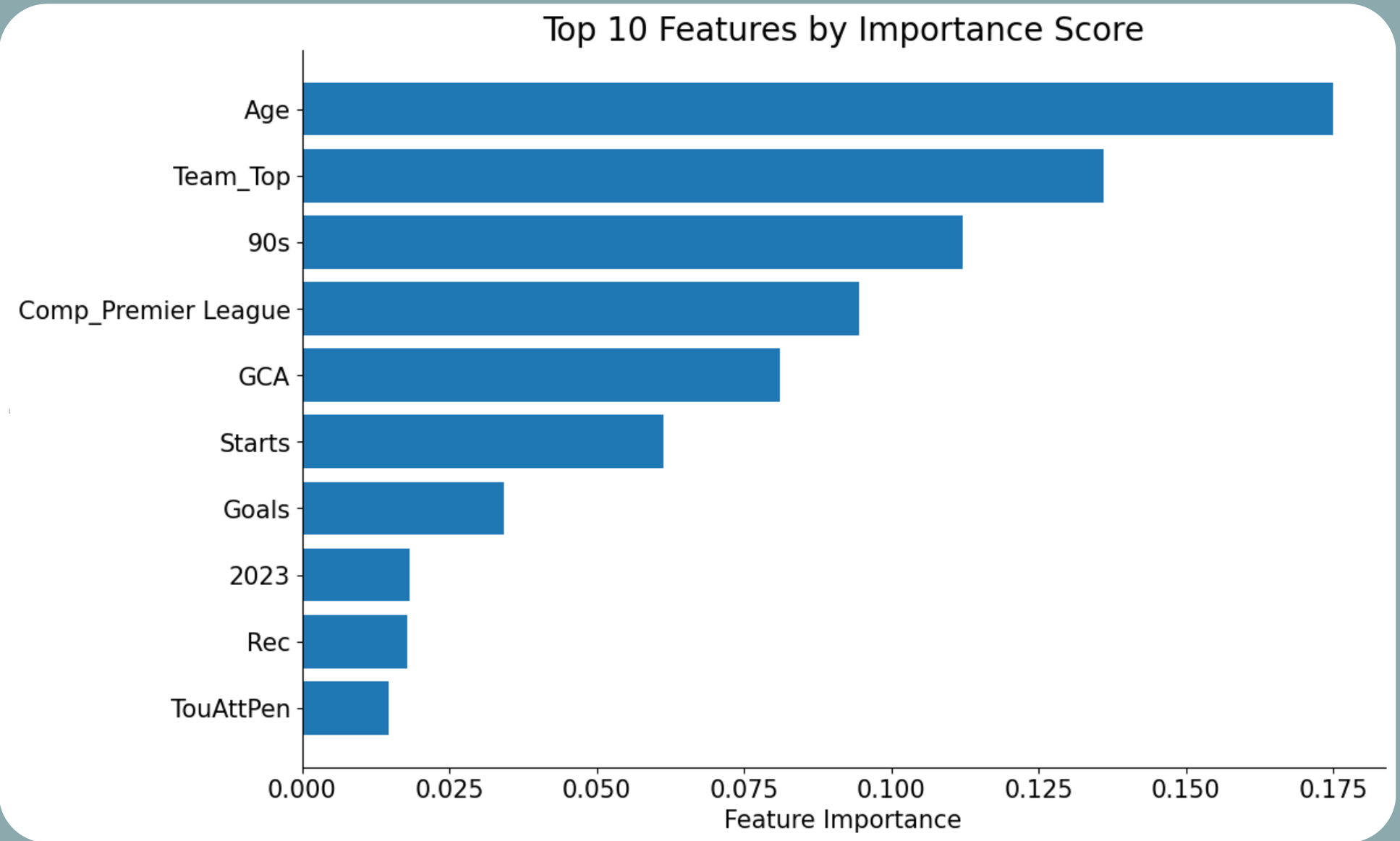
Actual vs Predicted Values





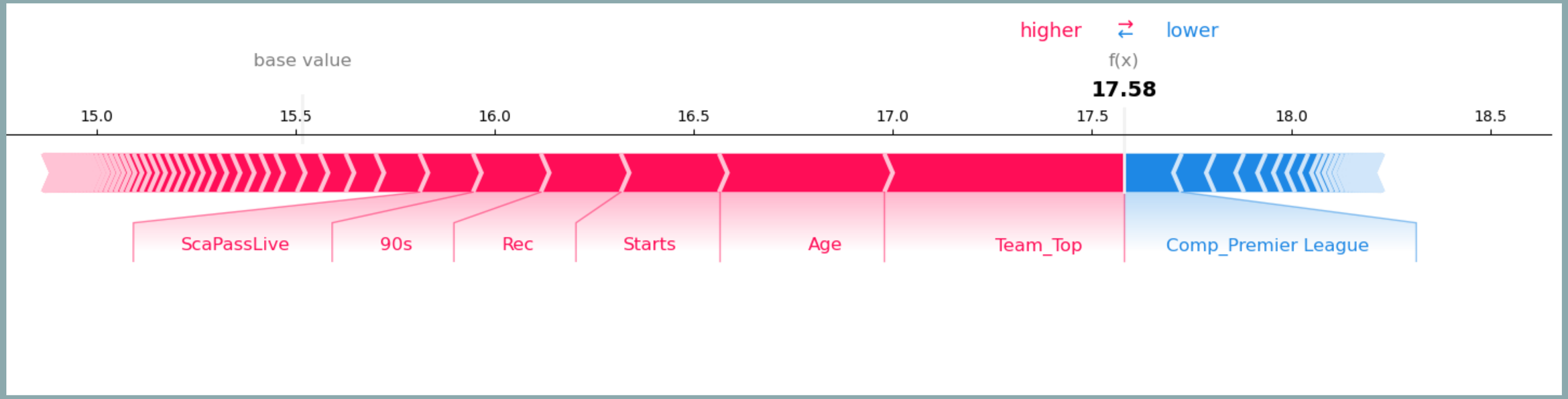
- Red line is perfect valuation
- Linear Regression more spread out
- Gradient Booster largely undervalues

Feature Importance



Alphonso Davies

Valuation: €70 million



Positive Features:

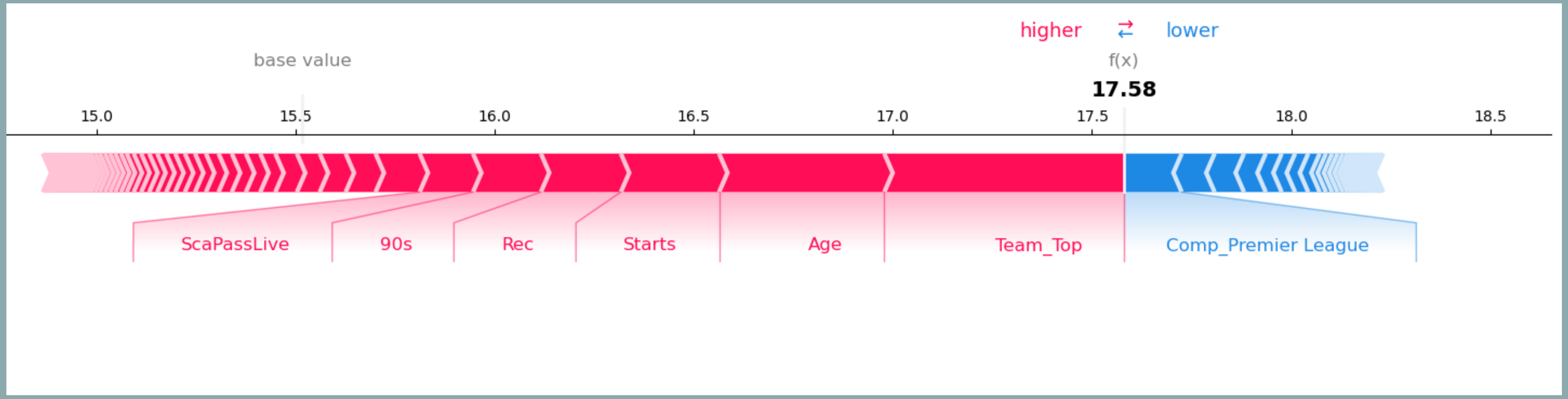
- Top Team
- Age
- Starts

Negative Features:

- Doesn't play in Premier League

Alphonso Davies

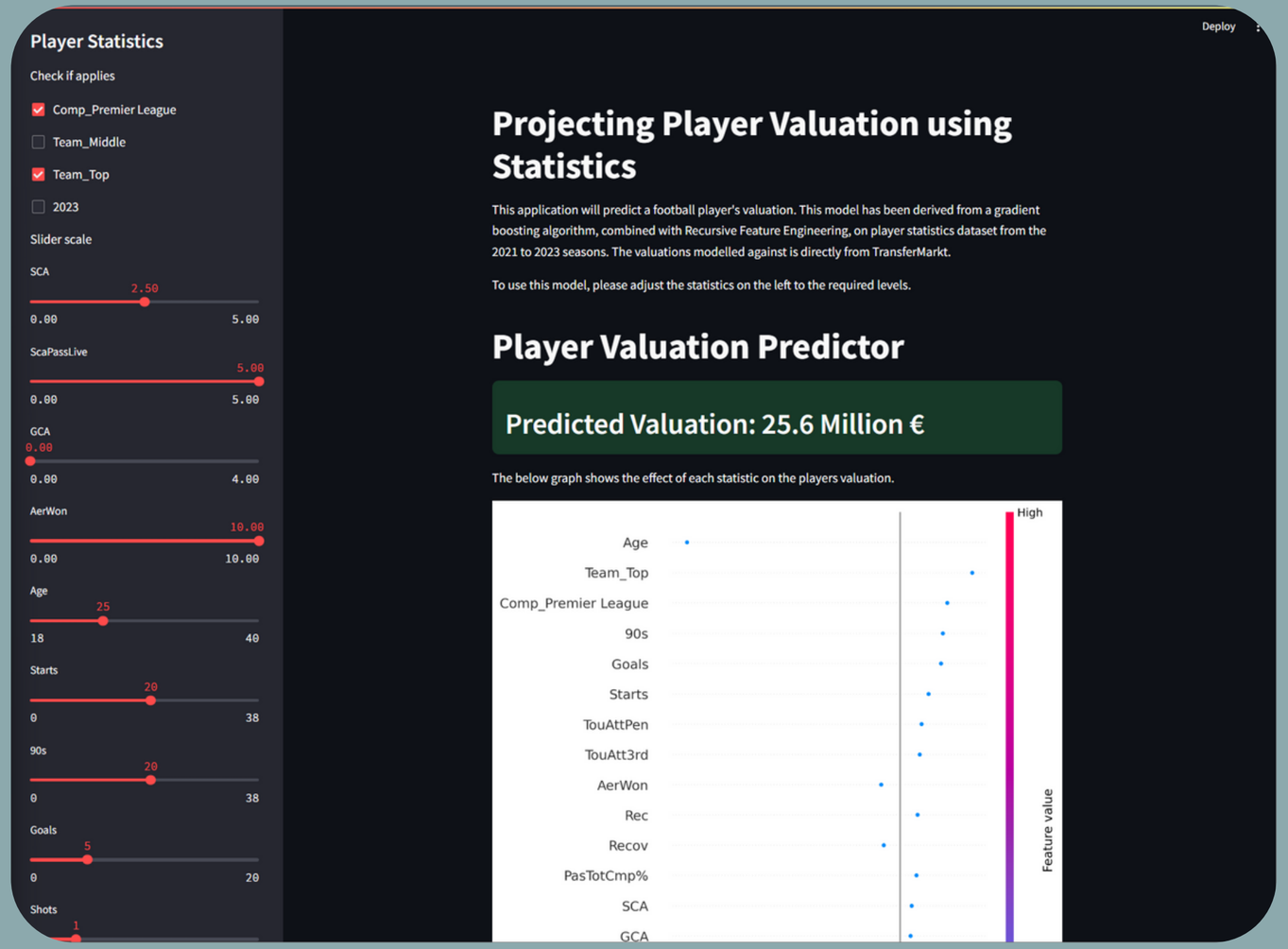
Valuation: €70 million



Shap Prediction:
43 Million

Booster Prediction:
43 million

Product Demo



Future Steps

- Look at transfer fees in past two years and evaluate model
- Find methods to improve model: Contract length, wages, other statistics
- Create more robust application
- Consider ethical implications of model/ project

Thank you!

LinkedIn Profile

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