

NCAA Basketball Presentation

M4AI

By the Nonchalant Hoopers
[Adeev, Oren, Omar, Akshay, and Kai]



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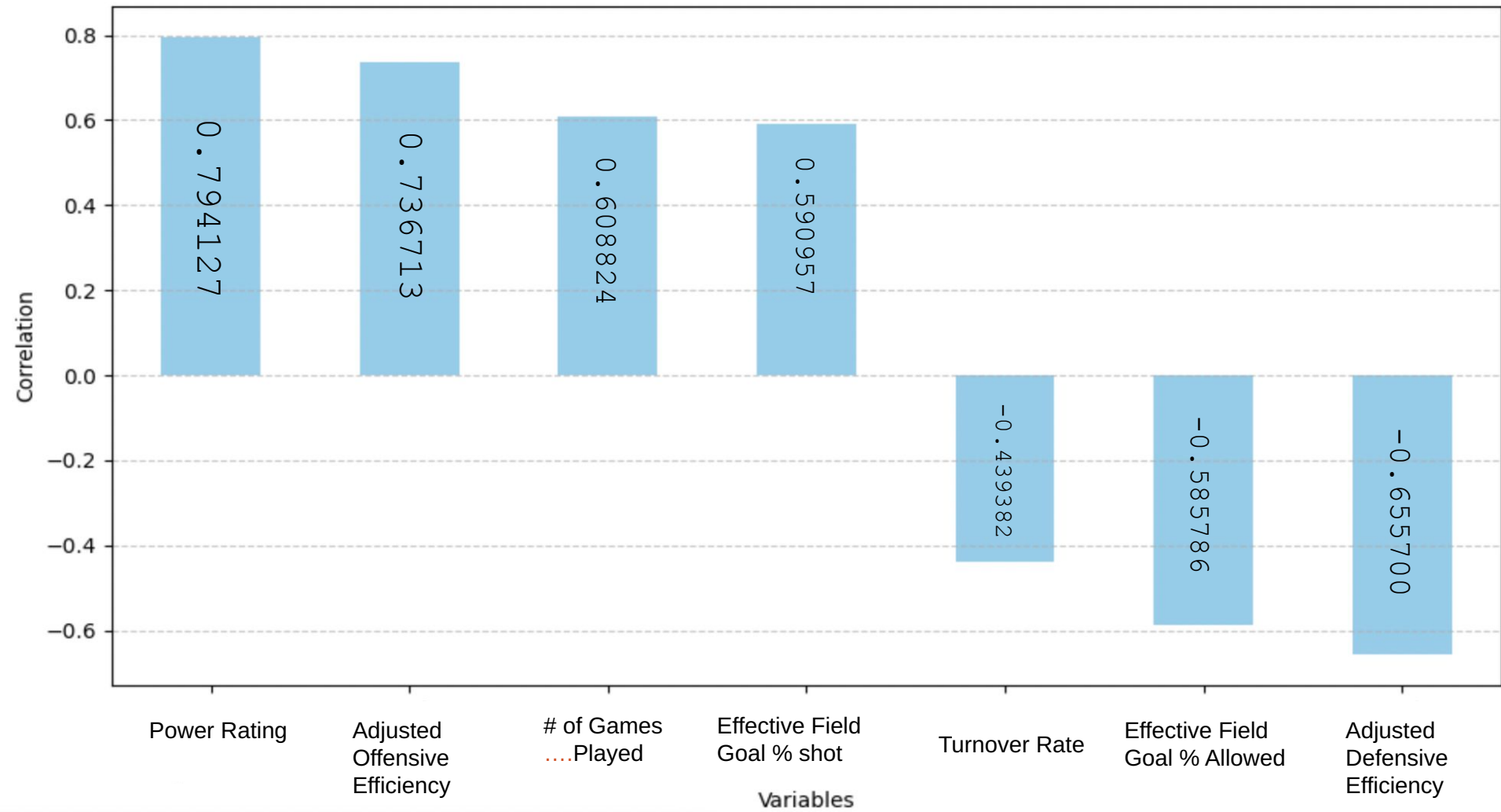


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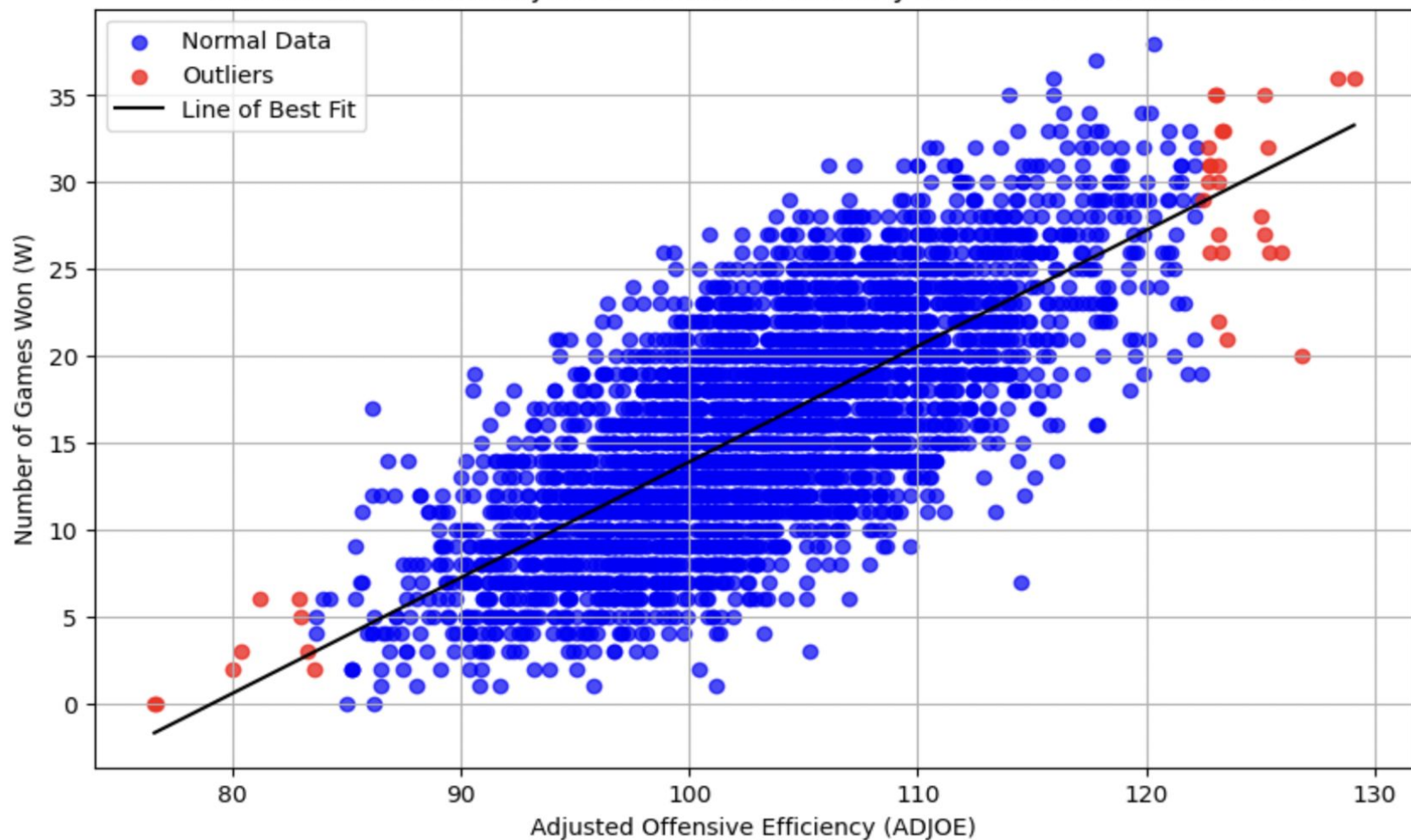
Recap

Of Data Visualisation Presentation

Correlation of Variables with Games Won



Correlation between Adjusted Offensive Efficiency and Number of Games Won



Mean Squared Error:

20.41

Intercept (β_0):

-53.17

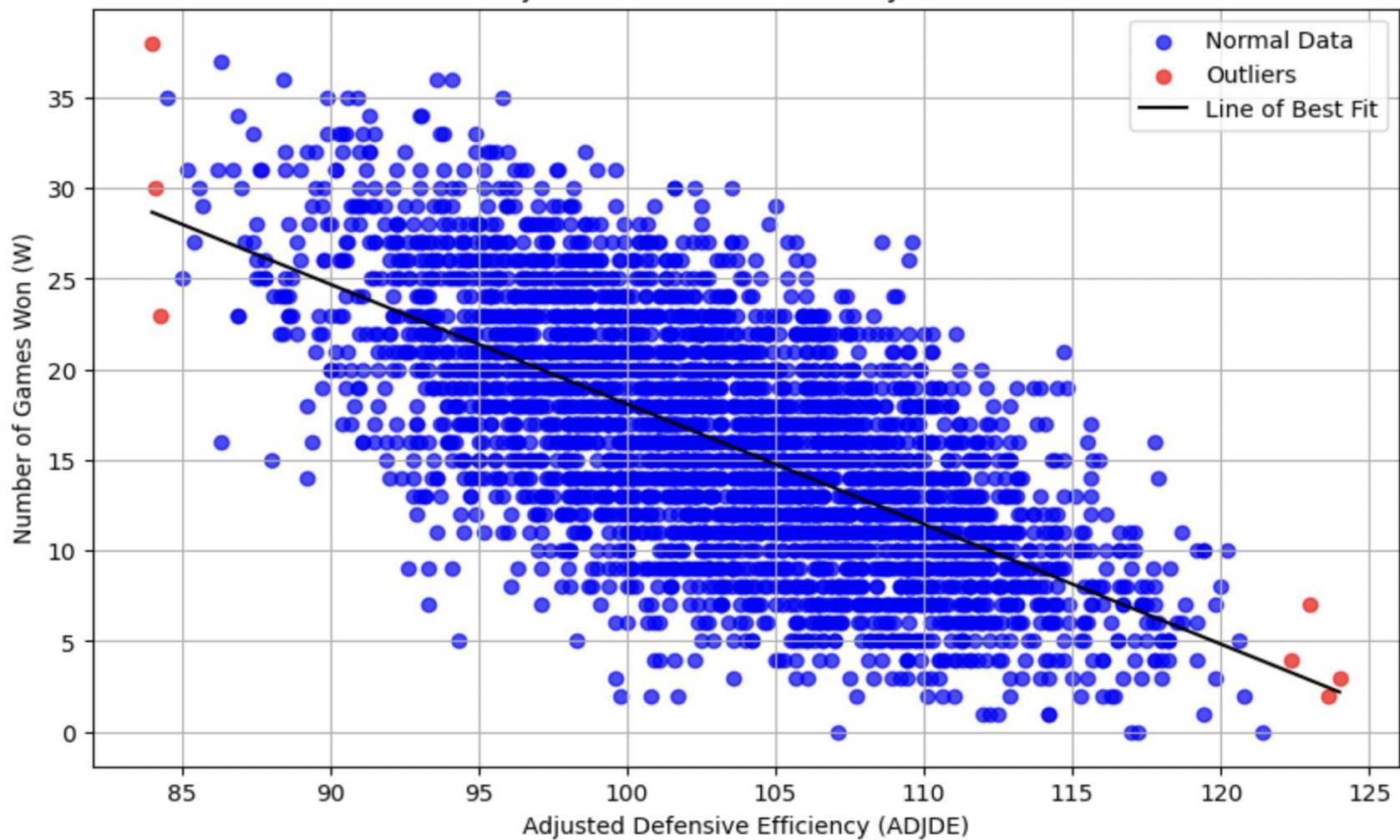
Total Squared Error:

14386.87

Slope coefficient (β_1):

0.670

Correlation between Adjusted Defensive Efficiency and Number of Games Won



Mean Squared Error:

23.34

Intercept (β_0):

84.26

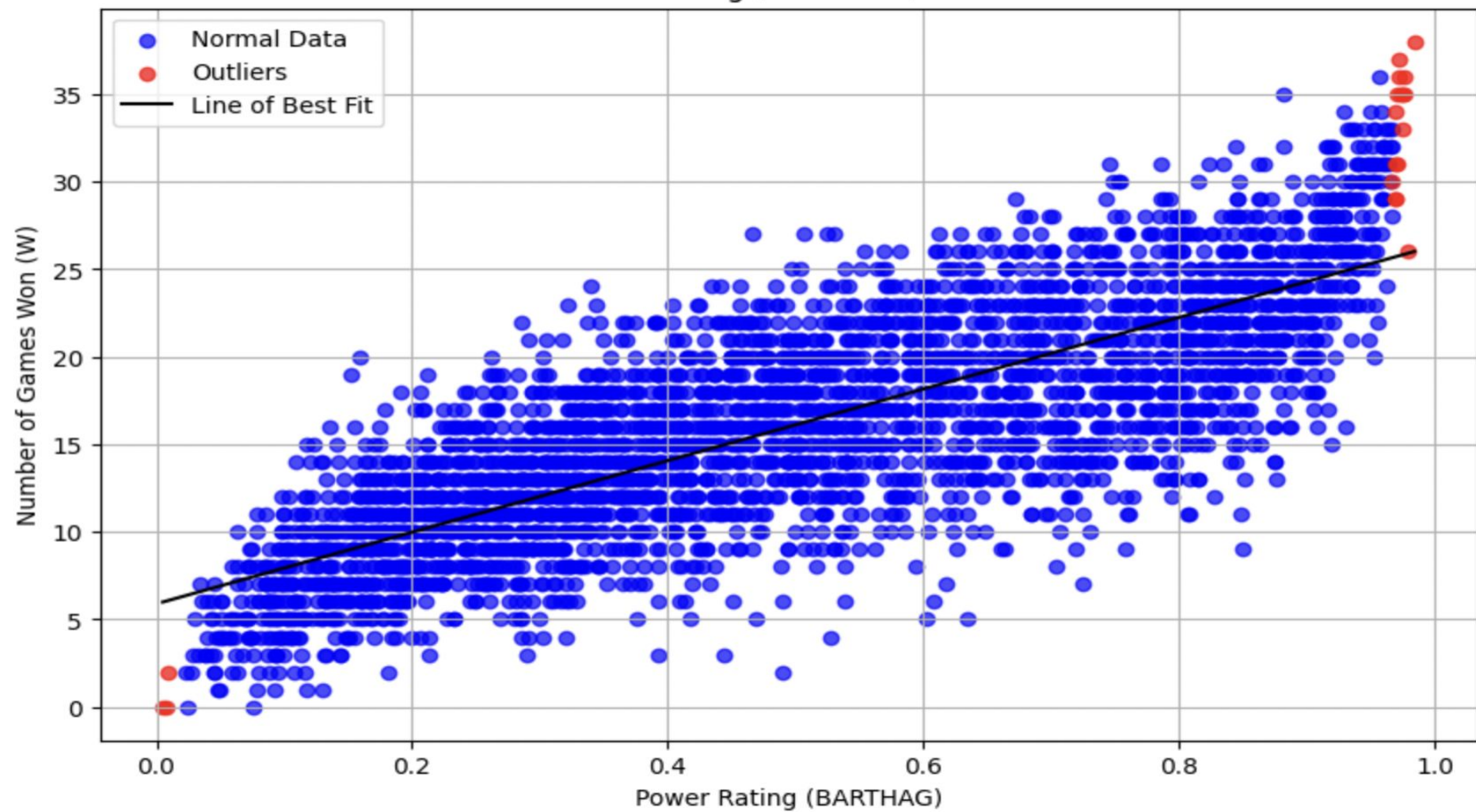
Total Squared Error:

16454.08

Slope coefficient (β_1):

-0.662

Correlation between Power Rating (BARTHAG) and Number of Games Won



Mean Squared Error:

15.57

Intercept (β_0):

5.891

Total Squared Error:

10979.96

Slope coefficient (β_1):

20.44

02

New Data Analysis

More Data Visualization relevant to the
topic

https://colab.research.google.com/drive/1pfh3KttG4dh_9LMIZcuHaxAjpZq6cDRD?usp=sharing#scrollTo=tHZsAxxwvpVv

03

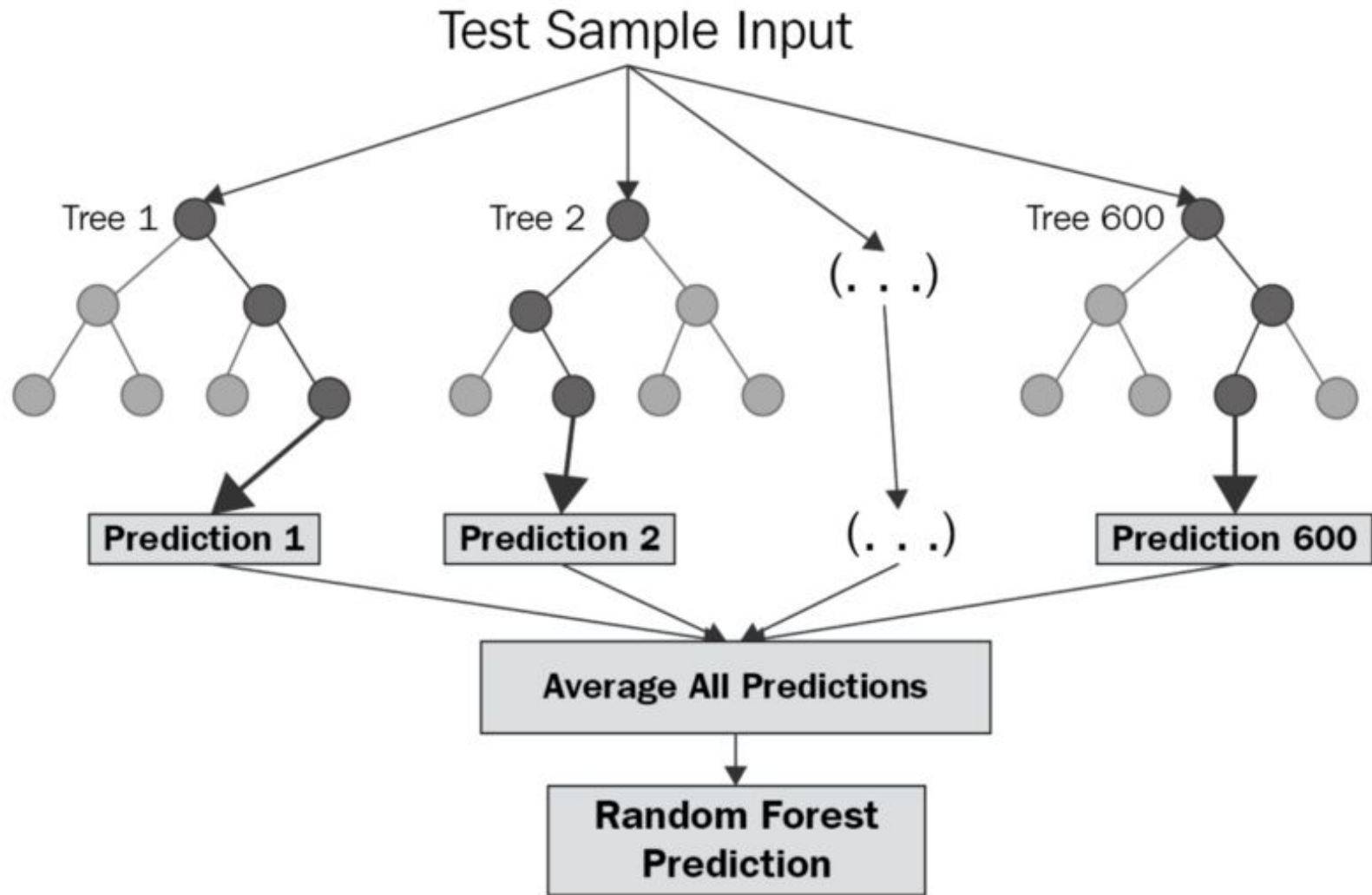
Game Prediction Model

Our AI game prediction model

All college basketball teams

List of all teams

Random Forest Regression



Why can't we incorporate Std.Dev?

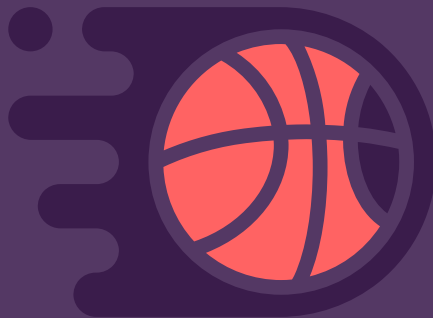


Conditional Probability

Applying Conditional Probability in Our Model

Context: Adjust the win probability of a team based on whether the game is played at home ('H') or away ('A').

Rationale: Teams often perform better at home due to familiar surroundings, crowd support, etc.



Model Adjustment

Home Advantage:

Increase the probability of the home team winning by a small factor.

Example: If the base probability is P , then home probability = $P + \Delta$ (where Δ is a small adjustment factor that's different for every team).

Prediction VS Reality Part I



Enter the name of the first team: Wisconsin

Enter the name of the second team: Michigan

Prediction for Wisconsin vs Michigan:

Probability of Wisconsin winning: 0.57

Stats for Wisconsin: {'G': 40.0, 'W': 36.0, 'ADJOE': 129.1, 'ADJDE': 93.6, 'BARTHAG': 0.9758, 'EFG_0': 54.8, 'EFG_D': 47.7, 'TOR': 12.4}

Probability of Michigan winning: 0.43

Stats for Michigan: {'G': 40.0, 'W': 33.0, 'ADJOE': 114.4, 'ADJDE': 90.4, 'BARTHAG': 0.9375, 'EFG_0': 53.9, 'EFG_D': 47.7, 'TOR': 14.0}

Wisconsin is more likely to win

Wisconsin is playing at home



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64



Michigan Wolverines

(14 - 12)

Wisconsin Badgers

(15 - 10)

Prediction VS Reality Part II



```
Enter the name of the first team: Duke
Enter the name of the second team: Virginia
Prediction for Duke vs Virginia:
Probability of Duke winning: 0.55
Stats for Duke: {'G': 39.0, 'W': 35.0, 'ADJOE': 125.2, 'ADJDE': 90.6, 'BARTHAG': 0.9764, 'EFG_0': 56.6, 'EFG_D': 46.5, 'TOR': 16.3}
Probability of Virginia winning: 0.45
Stats for Virginia: {'G': 38.0, 'W': 35.0, 'ADJOE': 123.0, 'ADJDE': 89.9, 'BARTHAG': 0.9736, 'EFG_0': 55.2, 'EFG_D': 44.7, 'TOR': 14.7}
Duke is more likely to win
Duke is playing at home
```



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4 Duke Blue Devils

(26 - 8)

2 Virginia Cavaliers

(25 - 7)

Prediction VS Reality Part III



Enter the name of the first team: Louisville

Enter the name of the second team: Notre Dame

Prediction for Louisville vs Notre Dame:

Probability of Louisville winning: 0.67

Stats for Louisville: {'G': 40.0, 'W': 35.0, 'ADJOE': 115.9, 'ADJDE': 84.5, 'BARTHAG': 0.9743, 'EFG_0': 50.6, 'EFG_D': 44.8, 'TOR': 18.3}

Probability of Notre Dame winning: 0.33

Stats for Notre Dame: {'G': 38.0, 'W': 32.0, 'ADJOE': 125.3, 'ADJDE': 98.6, 'BARTHAG': 0.9401, 'EFG_0': 58.3, 'EFG_D': 47.9, 'TOR': 14.5}

Louisville is more likely to win

Louisville is playing at home



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Louisville Cardinals

(2 - 19)

Notre Dame Fighting Irish

(10 - 12)

Model Limitations

Model Assumptions



Injured Key Players

Psychological Factors



Team Formations and Strategies

Randomness and Unpredictability



Historical and Old Data

04

Conclusion

Who would use our AI model and why?

- **Coaches and Team Managers:** optimize player rotations
- **Sports Analysts and Commentators:** Predictions for pre-game and post-game shows
- **Sports Enthusiasts and Fans:** understanding important variables to make accurate bets.
- **Sports Journalists:** To enrich their articles with data-backed predictions and analyses.
- **Betting Companies:** To set more accurate odds and manage risks

Comprehensive Overview

Project Objectives

- Develop an AI model to predict game outcomes for NCAA basketball teams and helping in betting.
- Utilize various machine learning techniques and statistical methods.
- Incorporate additional factors such as home court advantage using conditional probabilities.



Concepts we Utilized:

- Random Forest Regressor
- Conditional Probability
- Interquartile Range (IQR)
- Matplotlib
- Correlations
- Sklearn
- Linear regression
- Squared errors
- Slope coefficient & intercept
- Plotly - For plotting 3 dimensional graphs
- Tkinter - For GUI

THANK YOU