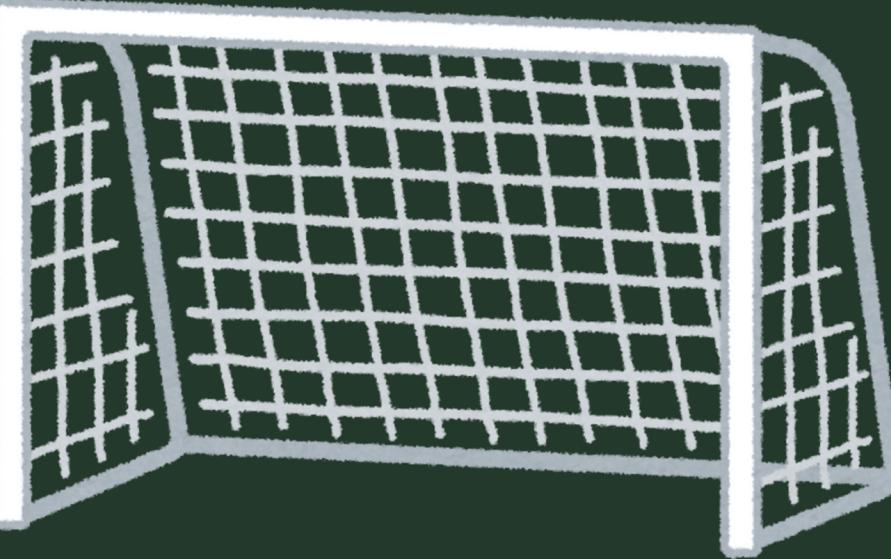
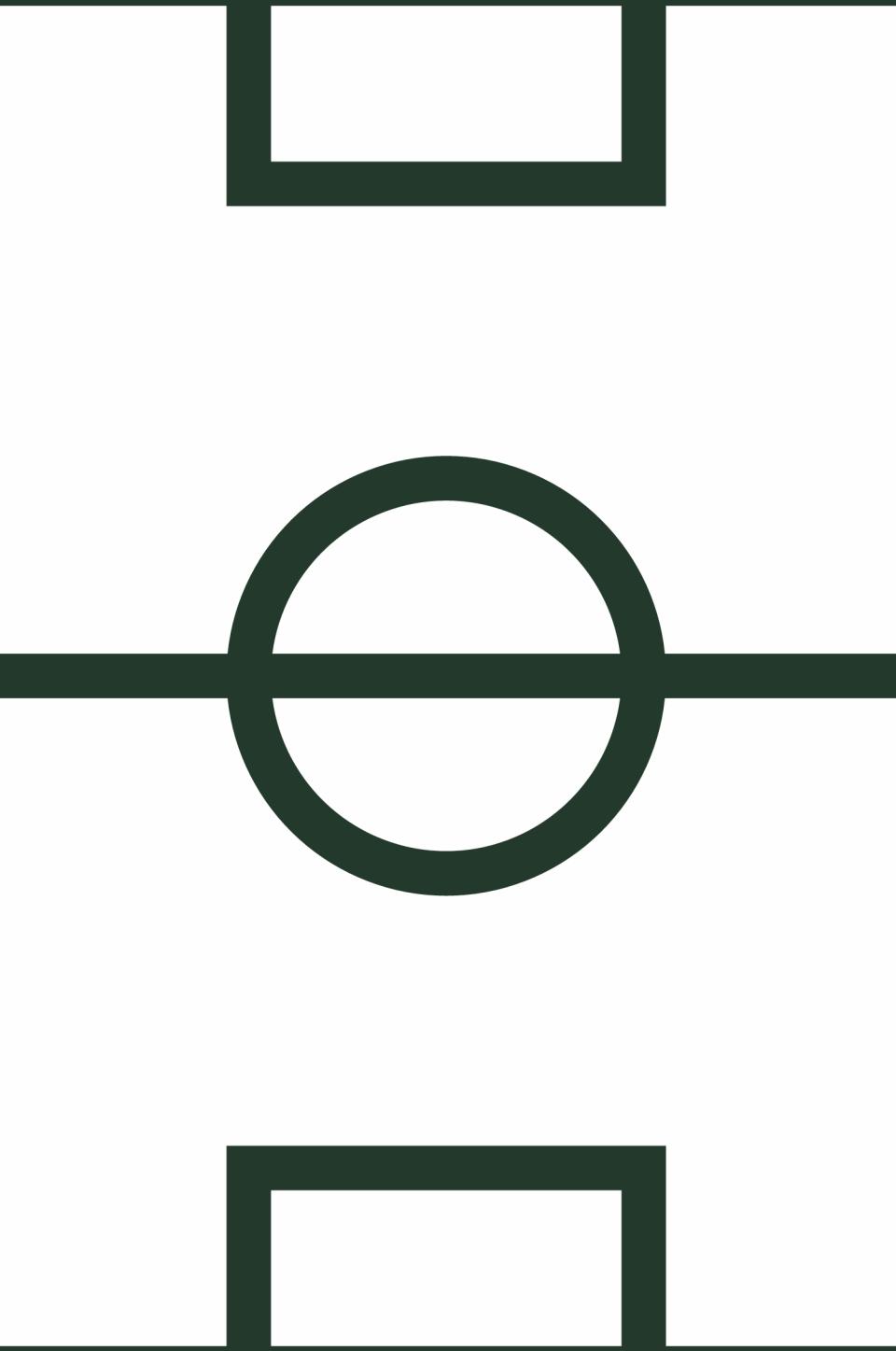


IMPACT OF THE FIRST GOAL

DOES THE FIRST GOAL MATTER?

- Scoring the first goal is often seen as a critical moment that shifts momentum in a soccer match.
- Previous studies show teams that score first have a significantly higher chance of winning.
- We explore if this holds true for La Liga matches during the 2023–2024 season.





OBJECTIVES

- Analyze whether scoring the first goal significantly increases a team's probability of winning.
- Build predictive models (Logistic Regression, Decision Trees) to test predictability.
- Investigate secondary factors such as match attendance.
- Visualize and interpret results to draw strategic insights.



DATASET DESCRIPTION

**Dataset from Sports Reference: La Liga
2023–2024 season match data**

- 380 matches

Key Variables:

- First goal scorer
- Match winner
- Expected Goals (xG, xG.1)
- Attendance



METHODOLOGY

Data Cleaning: Dropped matches with missing first goal data
(0-0 draws)

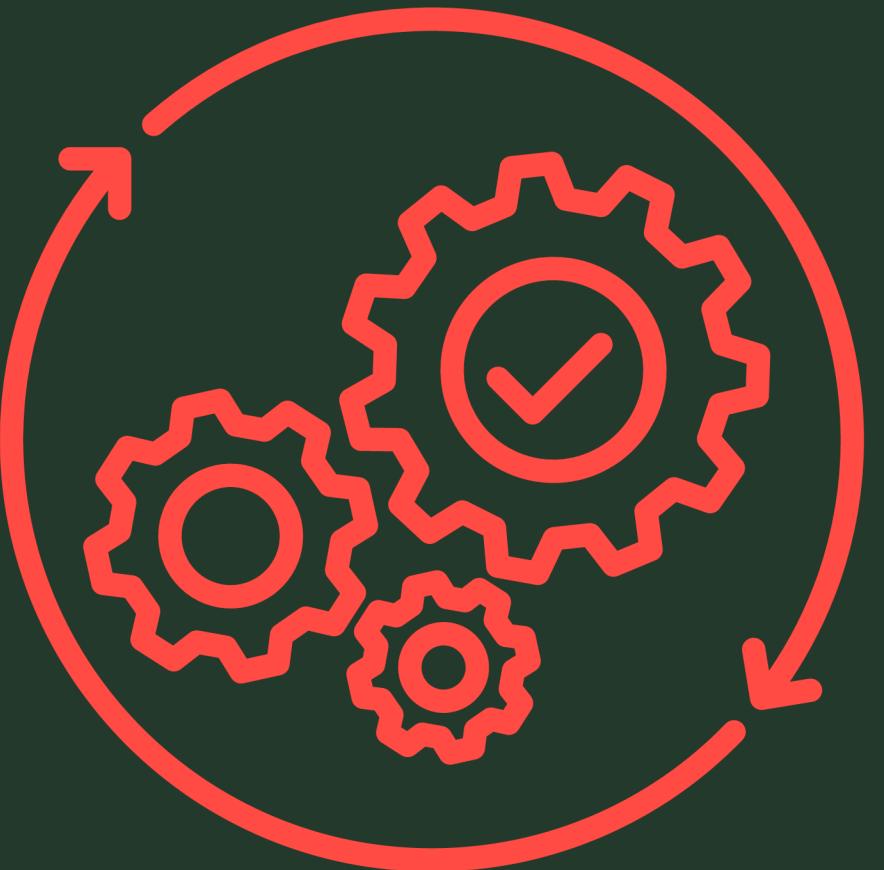
Feature Engineering: first goal win, home vs. away scored first
(binary)

Models Built:

- Logistic Regression
- Decision Tree
- Random Forest Classifier
- Team-level K-means Clustering

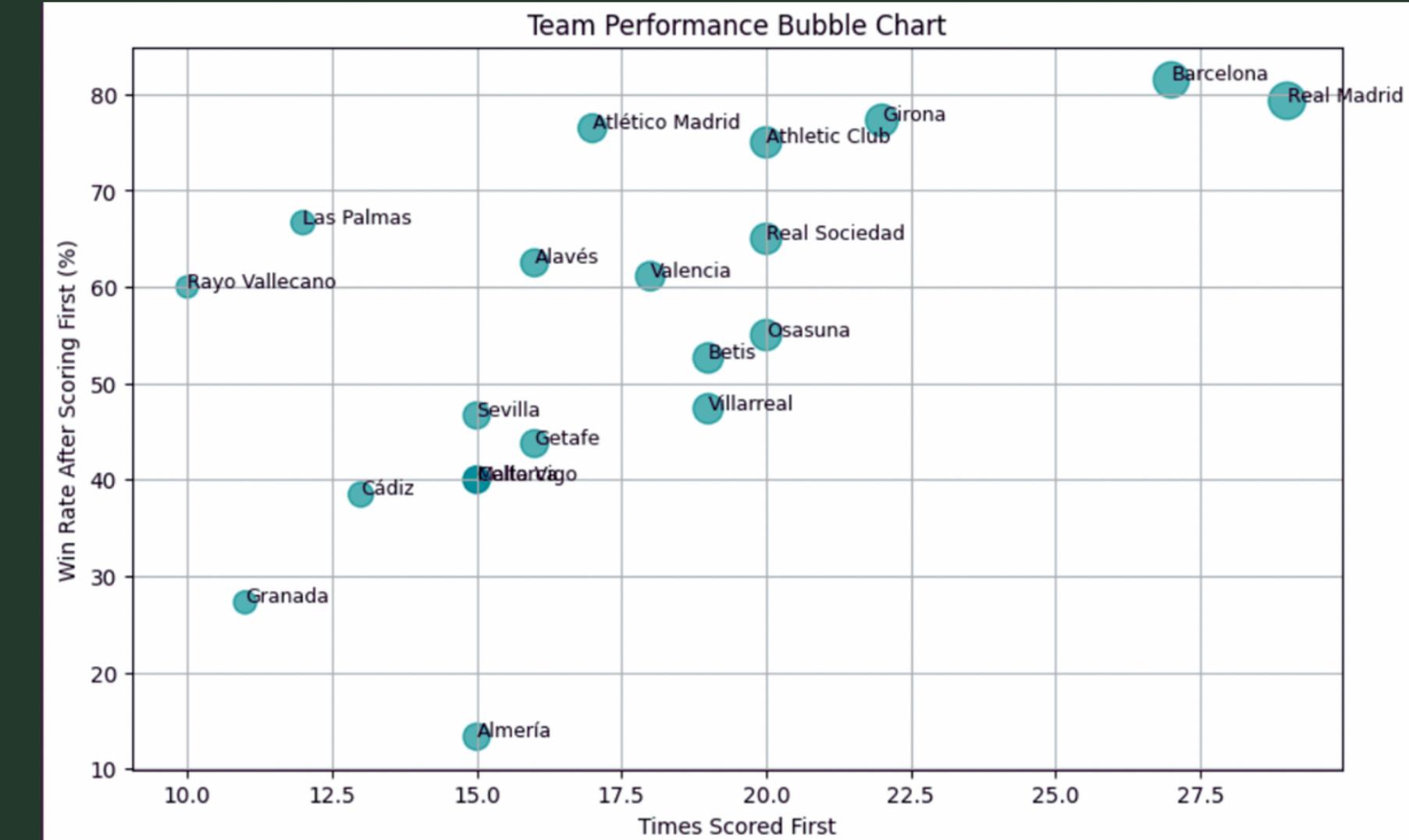
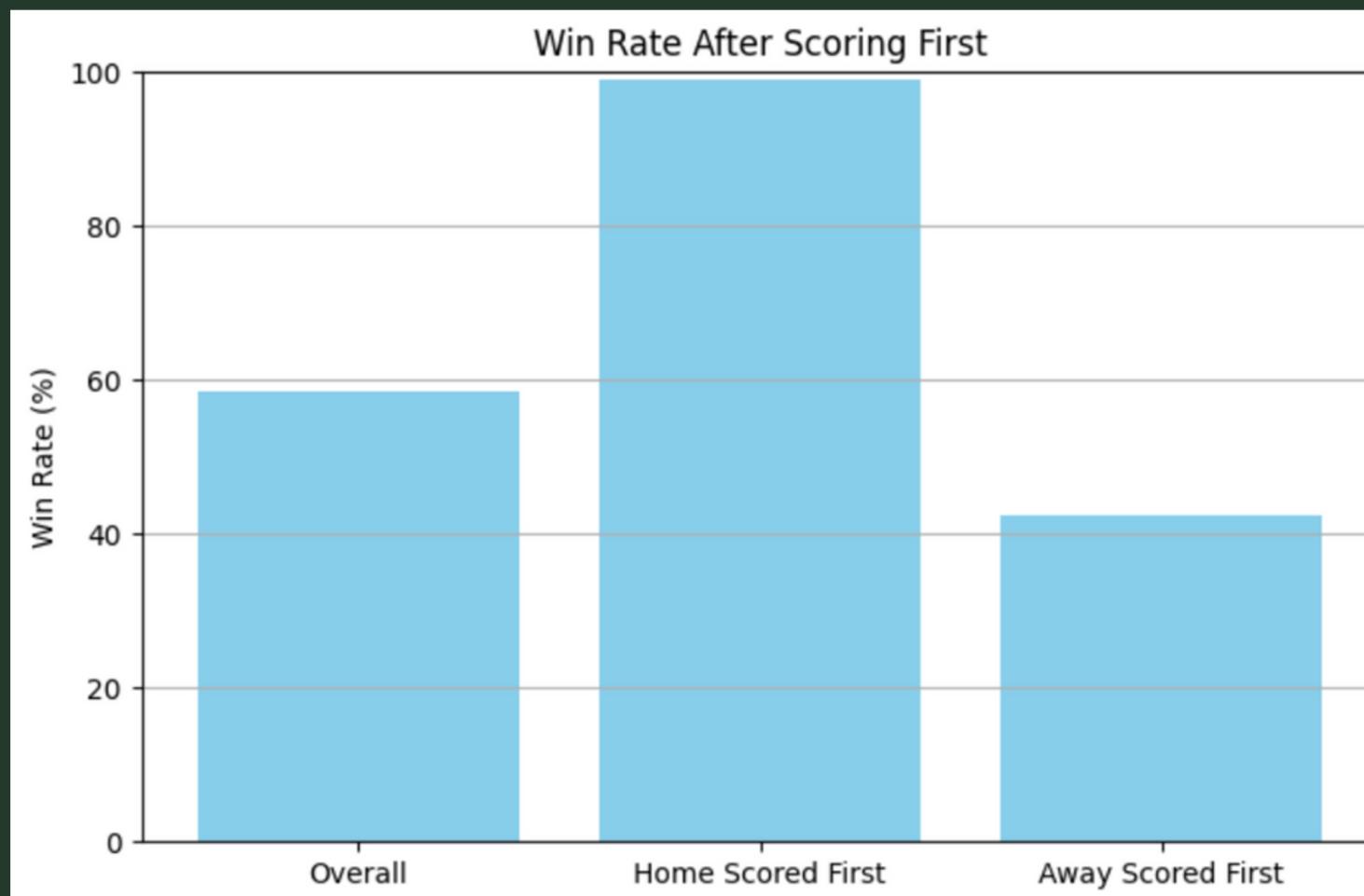
Evaluation:

- 80/20 Train–Test split
- 5-Fold Cross Validation
- Confusion Matrices for error analysis



EDA

- Overall Win Rate After Scoring First: 58.45%
- Home Teams' Win Rate After Scoring First: 98.99% (98 wins / 1 draw)
- Away Teams' Win Rate After Scoring First: 42.40%



- Teams that scored the first goal more often also tended to have higher win rates – but not always. Barcelona and Real Madrid scored first the most often and converted that into wins at very high rates.
- Teams like Girona and Atlético Madrid had relatively fewer first goals but still extremely high win conversion rates (above 75%)

MODELS

Logistic Regression

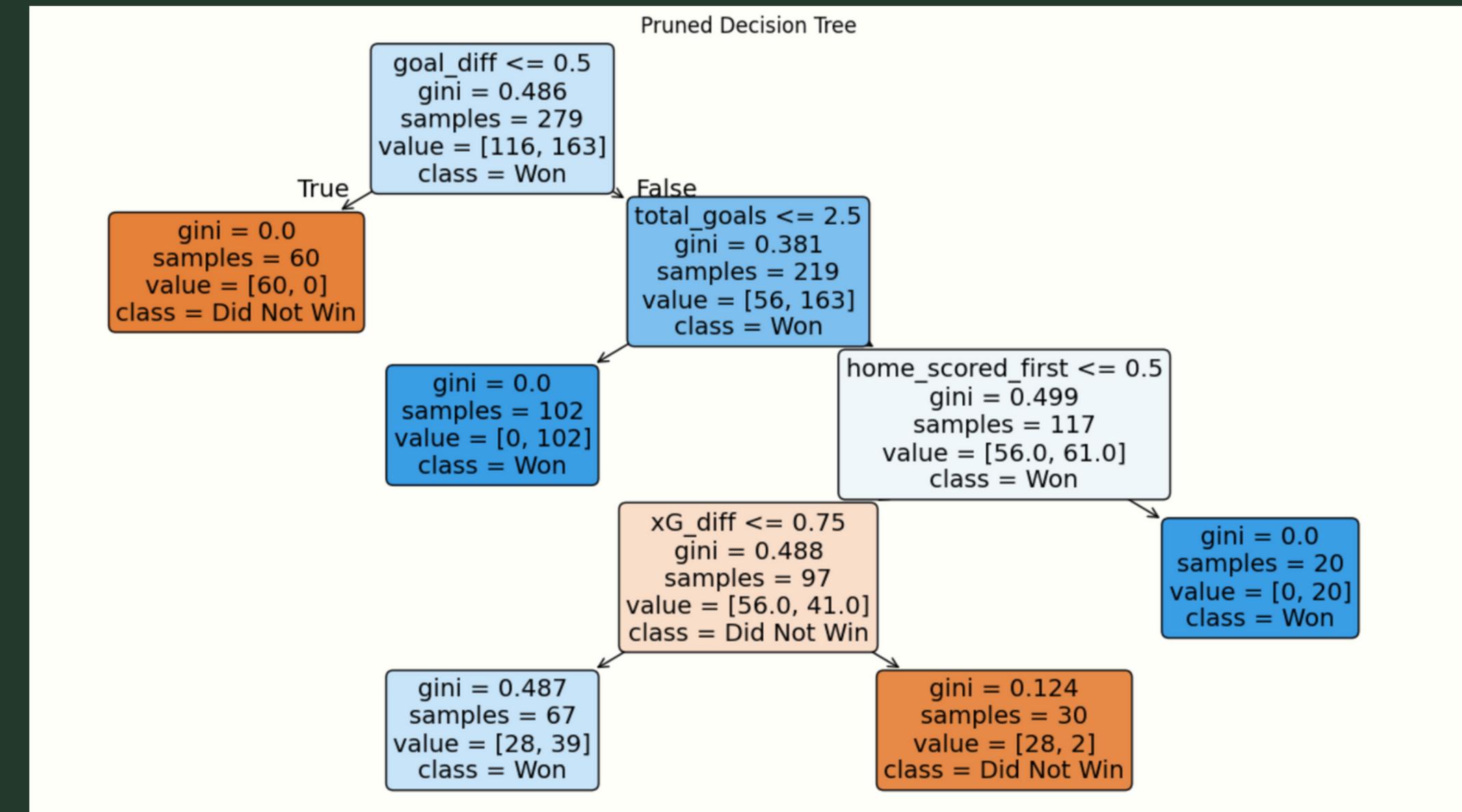
- **Test Accuracy: 82.86%**
- **ROC-AUC: 0.93**

Decision Tree

- **Test Accuracy: 90.00%**
- **ROC-AUC: 0.96**

Random Forest

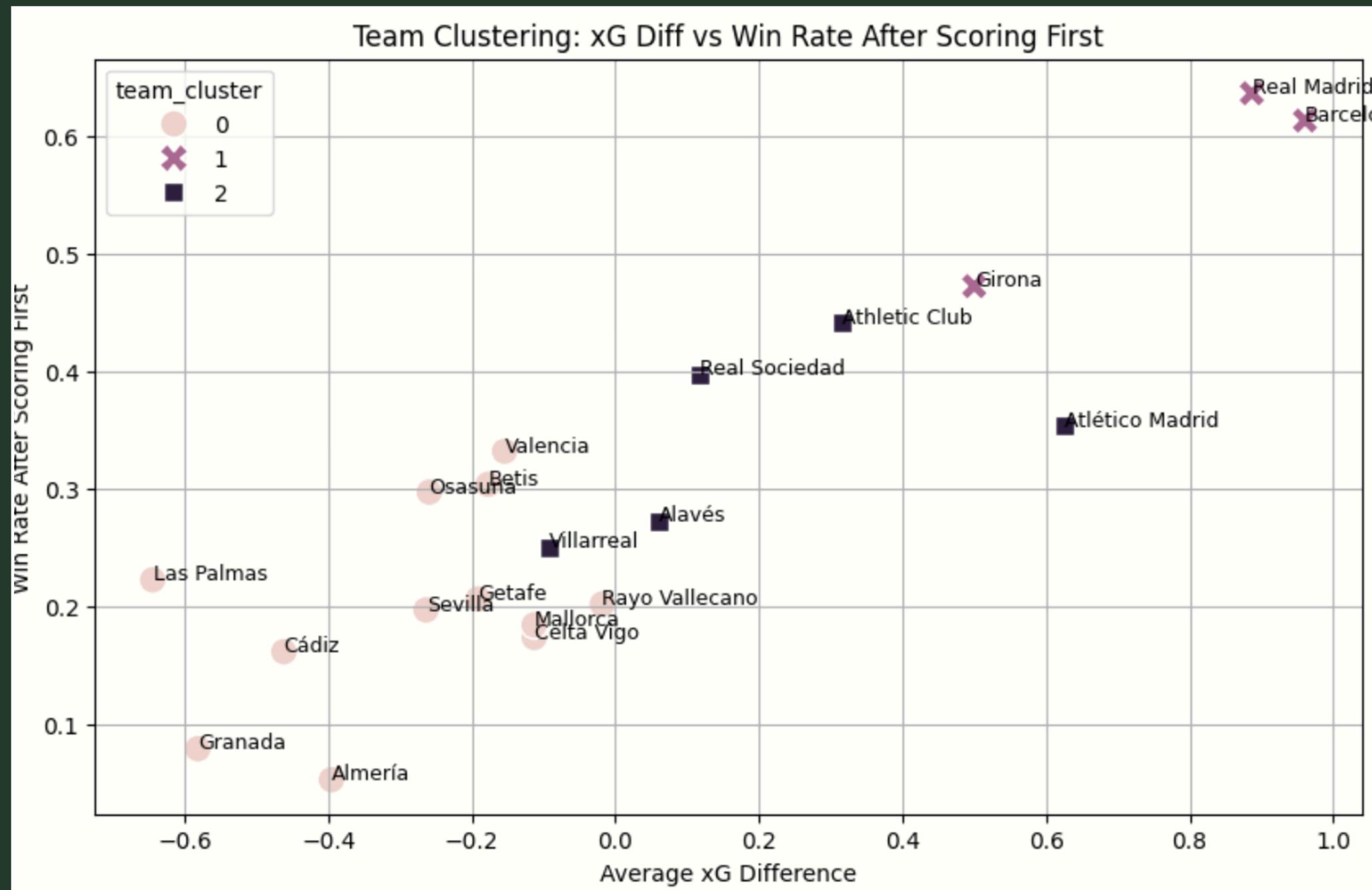
- **Test Accuracy: 82.86%**
- **ROC-AUC: 0.95**



IMPORTANT FEATURES

- **Goal_Diff**
- **Total_goals**
- **Home_scored_first**
- **x_Goal_Diff**
- **x_Away_Goal**

CLUSTERING



Key Findings:

- **Cluster 0 – Struggling Teams:** Low xG, get outplayed often, fragile after scoring first (**20% win rate**).
- **Cluster 1 – Dominant Teams:** High xG, strong control, high win rate after scoring first (**57%**).
- **Cluster 2 – Mid-Level Teams:** Balanced stats, moderate success after scoring first (**34%**).

DISCUSSION OF FINDINGS



- Scoring first matters
- Game styles affect outcome control
- Team profiles vary
- Modeling shows scoring first is a strong, but not sole, predictors

Strategic Insights:

- Coaches: Tailor tactics post-goal based on teams.
- Players: Stay Alert! Scoring first isn't equally safe, especially for mid and lower-tier teams.
- GMs: Recruitment focus: stronger defensive control for struggling teams or maintaining pressure for dominant teams.

LIMITATIONS AND LOOKING AHEAD

Limitations

- Exact timing of first goals was unavailable; missing data reduced the overall dataset size.
- Focused only on one season (2023–2024) and one league (La Liga), limiting generalizability.
- Excluded 0–0 draws, which may introduce selection bias.
- Predictive models (Logistic Regression, Decision Tree, Random Forest) may not perform as well across different leagues or seasons.

Future Research Opportunities

- Expand analysis to multiple seasons and additional leagues (e.g., EPL, Bundesliga).
- Include variables like minute of first goal, player-level statistics, and match events (e.g., red cards).
- Study the role of first goals specifically in drawn matches.
- Further explore how early goals influence match strategy, coaching decisions, and real-time outcome predictions.

CONCLUSION



Our project found that scoring the first goal minorly increased a team's chance of winning, with an overall win rate of 58.45% in the 2023–2024 La Liga season. By applying machine learning models and incorporating factors like attendance and expected goals (xG), we reinforced the importance of the first goal in match outcomes.



Our work advances sports analytics by offering updated, league-specific insights and highlighting team-specific trends that previous studies overlooked. This fresh perspective on first-goal impacts provides a foundation for future predictive and strategic analyses in soccer.

THANK YOU



References:

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Leite, Werlayne. "THE INFLUENCE OF THE FIRST GOAL ON THE FINAL RESULT OF THE FOOTBALL MATCH." *Baltic Journal of Sport and Health Sciences*, 2015, pp. 29–35, <https://doi.org/10.33607/bjshs>.