NBA Home Games Analysis - Unveiling Patterns in Home Wins

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Stakeholder and Problem

Stakeholder:

➢ NBA Teams

Problem:

➢ Optimizing performance and winning games in the evolving landscape of the NBA.

Data Overview

We've gathered data from the NBA Database from Kaggle:

➢ 65,698 rows and 55 features
➢ Cleaned and processed for analysis
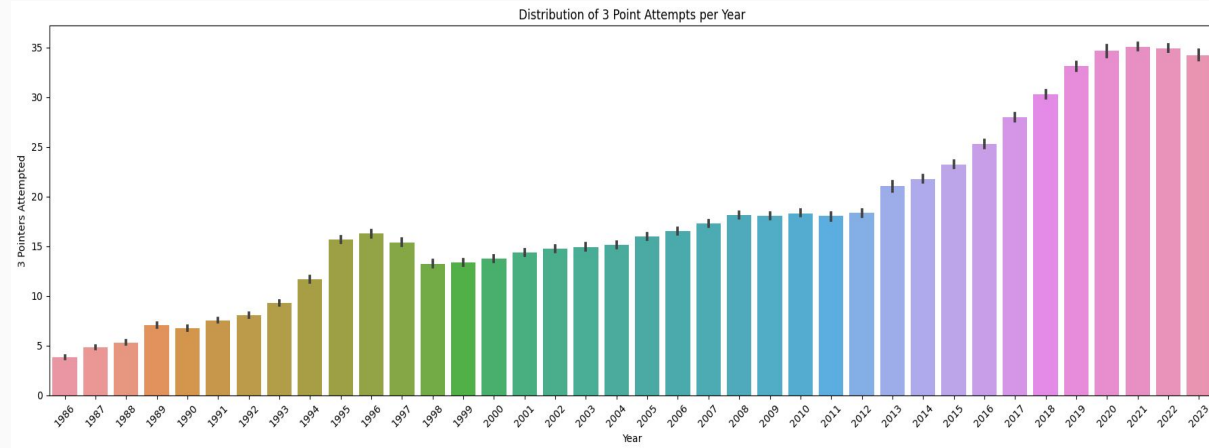➢ Exploratory Data Analysis (EDA) performed

Key Findings Visuals - 3-Point Attempt Trends

Top 5 three-point attempt seasons:

1. 2021: 56,967
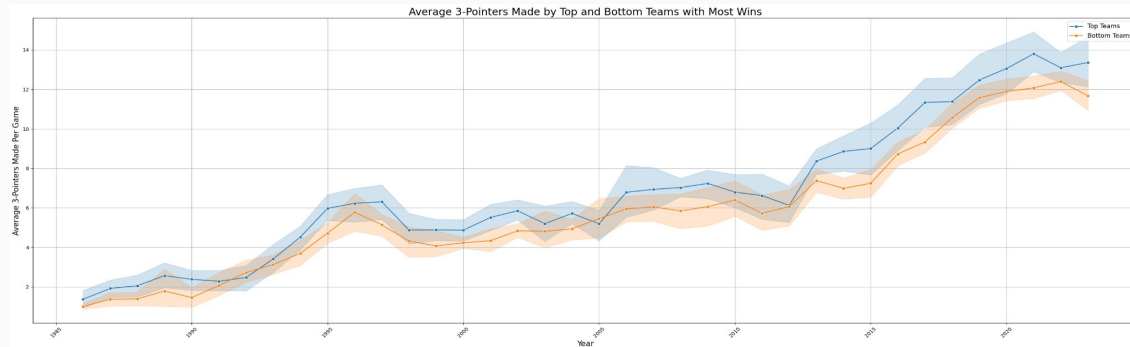2. 2022: 46,646
3. 2019: 41,917
4. 2018: 39,849
5. 2017: 37,685

Bottom 5 three-point attempt seasons:

1. 1986: 3,397
2. 1987: 4,526
3. 1988: 5,433
4. 1989: 7,724
5. 1990: 7,826

Distribution of 3 Point Attempts per Year

Key Findings Visuals - 3-Point Success and Home Win Records

➢ Correlation between average successful 3-pointers and home win records.
➢ Top teams with higher home win records have increased successful 3-pointers.
➢ Emphasis on long-range shots leads to exploiting scoring opportunities and enhancing performance.

Average 3-Pointers Made by Top and Bottom Teams with Most Wins

Model Strengths and Limitations

➢ Machine Learning Models used: KNN, Decision Tree, Logistic Regression, XGBoost, LightGMB

➢ Best-performing model: Tuned Logistic Regression

➢ Model Strengths: Interpretable results, aiding decision-making

➢ Model Limitations: Historical data, not accounting for dynamic factors

Interpretable Metric for Classification Problem

➢ Chosen Metric: F1-Score
➢ F1-Score balances precision and recall.
➢ High F1-Score indicates balanced win-loss prediction.

Tuned Logistic Regression Model (Testing Set):

	f1-score
0 (loss):	.81
1 (win):	.87
accuracy:	.85
macro avg:	.84
weighted avg:	.85

Recommendations

➢ Increase 3-Point Attempts:
  ○ Exploit rising 3-point percentage trend.
  ○ Enhance point production and strategic flexibility.

➢ Prioritize Field Goals:
  ○ Improve overall point production.
  ○ Impact team performance positively.

Limitations and Next Steps:

➢ Data Limitations:
  ○ Historical nature, might not capture dynamics.
➢ Next Steps:
  ○ Explore defensive statistics and their impact.
  ○ Gain deeper insights into winning strategies.

Contact Information

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Questions and Discussion

Thank you for your attention! I'm now open to any questions or discussions you might have about our NBA Home Games Analysis.