**Analysis of NFL Draft Trends and Contracts Over the Last Four Years**

**Introduction**

Our project aimed to identify critical factors from recent NFL draft classes contributing to a player's likelihood of securing a successful second contract with the same team. We aimed to uncover patterns and insights by examining trends in draft positions, player performance metrics, positional value, initial contract lengths, performance statistics, injury history, and team dynamics. This analysis focused on draft classes from the past four years and used data cleaning, exploration, and visualization techniques.

**Data Collection and Preprocessing**

**Data Sources**

- nfldatapy: This Python library provides data on NFL draft picks, player statistics, and contact details.

- NFL Contract and Draft Data from Kaggle: This dataset contains NFL contracts and draft pick data for players between 2000 and 2023.

**Data Standardization**

To ensure consistency across the dataset, we developed a dictionary to standardize team names and used a `.map` function to replace team names in the dataset with standardized names. This step was crucial for accurate analysis and comparison.

**Identifying Second Contracts**

We created a new column to indicate if a player had signed a second contract, represented as a boolean or binary indicator (0/1). This allowed us to analyze the rate of second-contract signings and identify patterns related to various factors.

**Handling Duplicates and Expanding the Dataset**

We used functions like `.unique()` and `.value\_counts()` to ensure each player was counted uniquely and not duplicated in the dataset. We also considered expanding the dataset to include second-round picks to analyze the rate of second-contract signings between first- and second-round picks.

**Data Analysis**

**Positional Analysis**

We identified which positions likely have players secure a second contract with the same team. By analyzing the distribution of positions, we found that certain positions, such as quarterbacks and defensive linemen, had higher rates of securing second contracts.

**Performance Metrics**

We analyzed performance metrics, such as games played, touchdowns, and tackles, to determine their correlation with receiving a second contract. Our findings indicated that higher performance metrics positively correlated with the likelihood of securing a second contract.

**Draft Position Impact**

We examined how the draft position (early vs. late rounds) influenced the chances of obtaining a second contract. Players drafted in earlier rounds were more likely to receive a second contract, highlighting the importance of a draft position.

**Contract Length and Value**

We investigated the typical contract lengths and values of players who secure a second contract versus those who do not. Players with more extended initial contracts and higher signing values were more likely to secure a second contract.

**Team Strategies**

By comparing different team strategies for drafting and retaining players, we identified which teams succeeded in keeping their draft picks. Teams with robust player development and support systems had higher retention rates.

**Injury History**

We assessed the impact of injury history on the likelihood of securing a second contract. Players with fewer injuries or better recovery records had higher chances of receiving a second contract.

**Economic Factors**

We considered the financial and salary cap implications of second contract decisions. Teams with better salary cap management retained players with second contracts more successfully.

**Career Longevity**

We analyzed the average career longevity of players who secure a second contract with the same team compared to those who move to other teams. Players who stayed with the same team tended to have longer careers.

**Comparative Analysis**

We used other teams as baselines to determine the relative success of different strategies in securing second contracts for their draft picks. This comparative analysis provided insights into best practices for player retention.

**Key Findings**

- Positional Trends: Certain positions, like quarterbacks and defensive linemen, have higher second contract rates.

- Performance Metrics: Higher performance metrics correlate with an increased likelihood of securing a second contract.

- Draft Position: Early-round draft picks are more likely to obtain a second contract.

- Contract Length and Value: Longer initial contracts and higher signing values are indicators of future second contracts.

- Team Strategies: Successful teams have robust player development and support systems.

- Injury Impact: Players with fewer injuries or adequate recovery histories are more likely to secure second contracts.

- Economic Management: Effective salary cap management contributes to higher retention rates.

- Career Longevity: Players with the same team tend to have longer careers.

**Conclusion**

Our analysis provides valuable insights into the factors influencing the likelihood of NFL players receiving a second contract with the same team. Understanding these factors can help teams improve their drafting strategies, player development programs, and financial management practices to enhance player retention and team performance.

**Future Work**

- Expanded Dataset: Including more draft classes and additional rounds can provide a more comprehensive analysis.

- Advanced Metrics: Incorporating advanced performance metrics and injury data can refine the analysis.

- Longitudinal Study: Conduct a longitudinal study to track player performance and contract trends.

- Comparative Team Analysis: Further analysis comparing different team strategies in-depth to identify best practices.

References

- nfldatapy: Provides data on NFL draft picks, player statistics, and contact details.

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