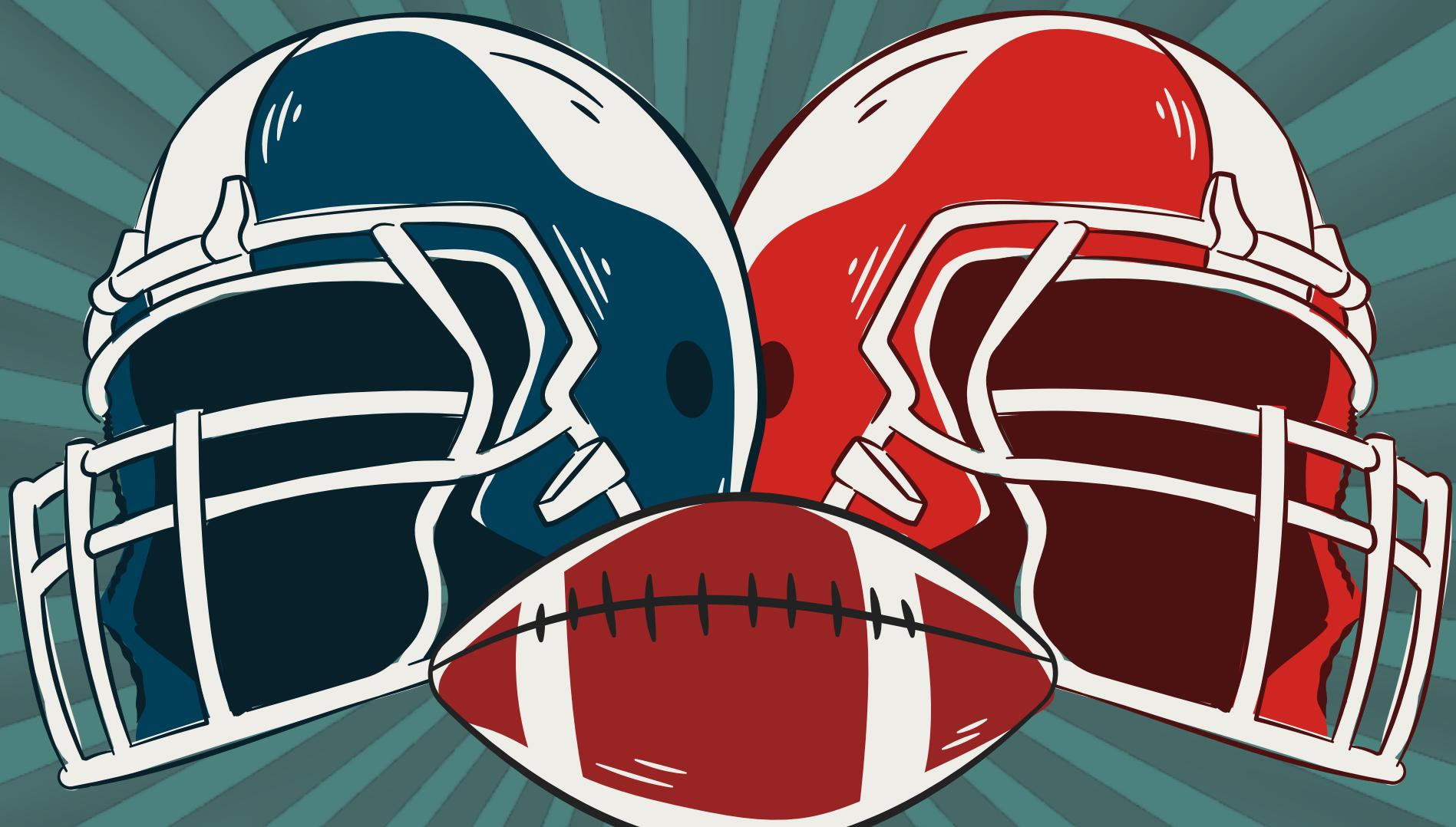


# BEATING THE BOOKS: A SPORTS BETTING ANALYSIS



GROUP D

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01.

## INTRODUCTION

What is Sports Betting?  
Why does it matter?

02.

## DATA COLLECTION

Where and what data  
was collected? How  
was it formatted?

03.

## RESULTS & EVALUATION

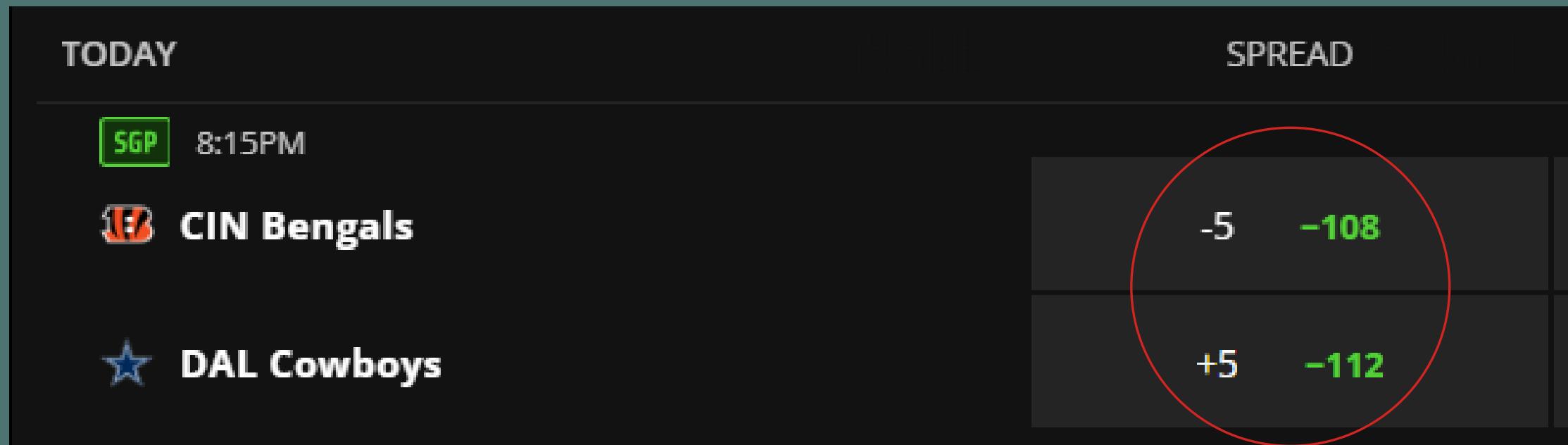
What does our data  
mean & how it can be  
used?



# THE LANDSCAPE OF SPORTS GAMBLING

- Sports gambling has turned into a 10 billion dollar business
- Expected to grow to 45 billion after further legalization
- 38 US states where sports gambling is legal
- Further growing into a major part of sports culture
- 35% of legal sports gamblers signed up in the past year

# SPREAD EXAMPLE



**Bengals -5:** Bengals need to **win by more than 5 points** for a bet win

**Cowboys +5:** Cowboys need to **win or lose by less than 5 points** for bet to win

**Game result:** Bengals won 27-20

- Bet placed on Bengals -5 would have been a winner

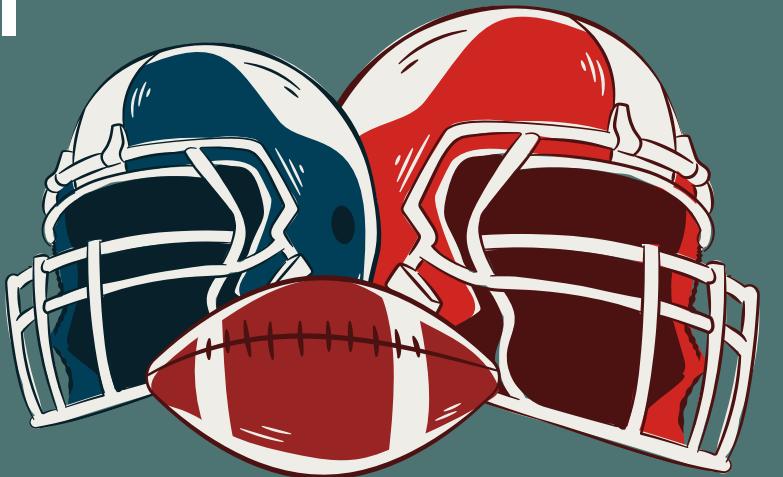
# OUR TASK

- Sportsbook lines are volatile
  - Public bet
- 50/50 public bet
  - Guaranteed profit for sportsbooks
- **Goal:** Create more accurate initial lines by incorporating pre-game public sentiment and team statistics into a model
  - **Sportsbooks:** Help set better initial lines and increase profit by generating more 50/50 bets
  - **Bettors:** Identify potential profitable markets **before** the public and sportsbooks tweak lines

# DATA COLLECTION

## STRUCTURED

- Obtained from pro football reference.
- Game by game statistics.
- Grouped by team.
- Moving averages to help with relevancy.

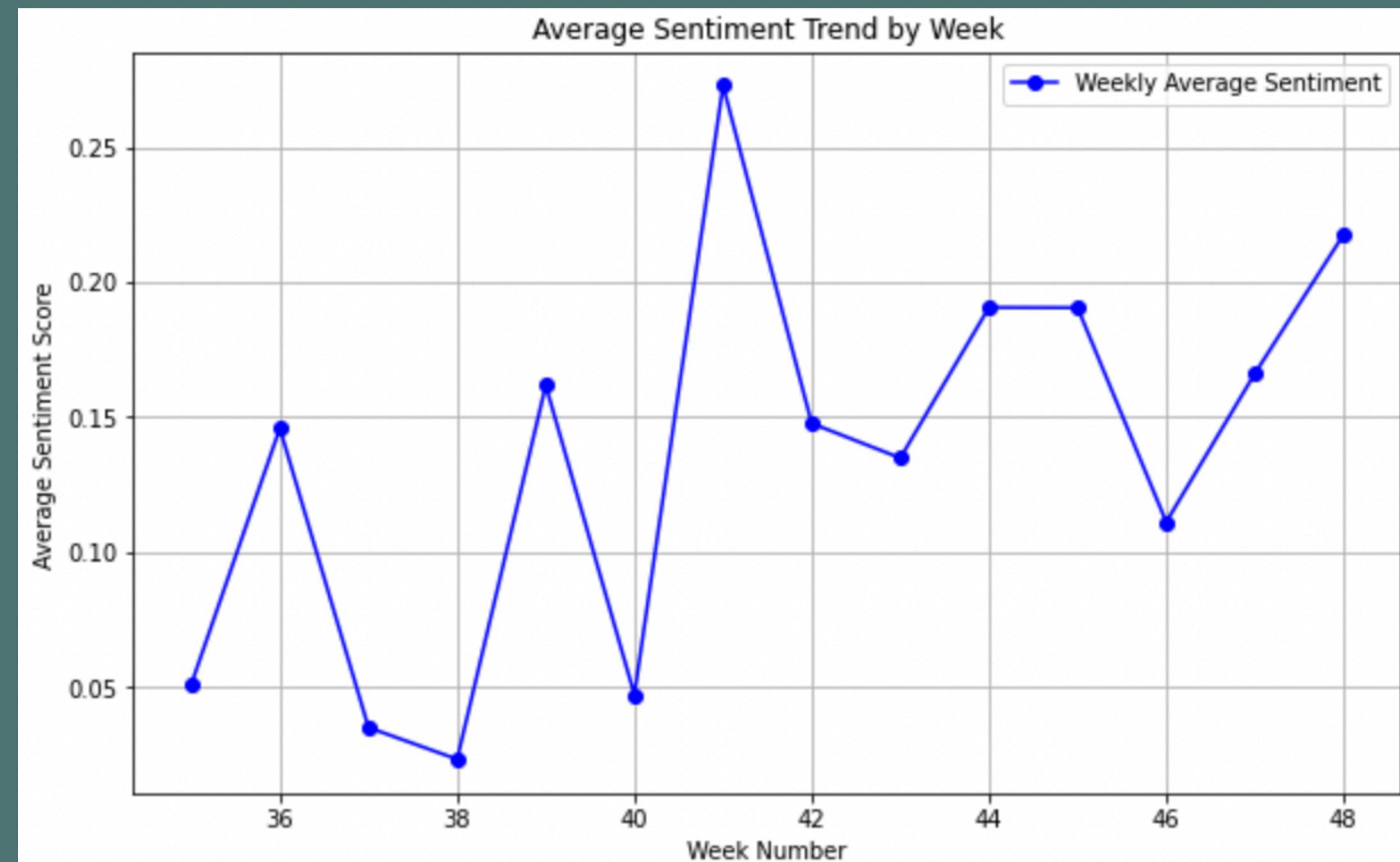


## UNSTRUCTURED

- Reddit API
- Sentiment Analysis of Recent User Posts
- Grouped by on-season week and team

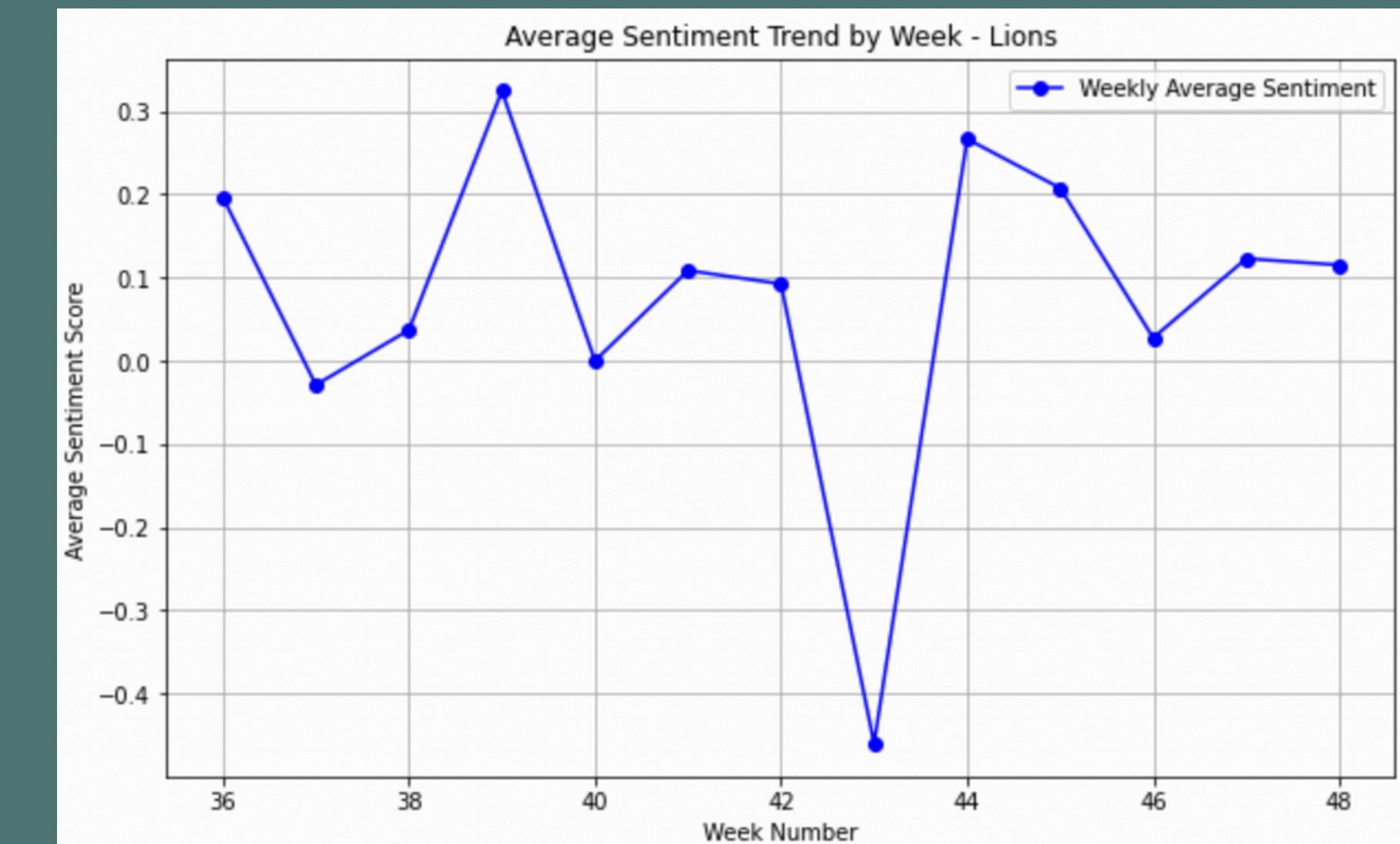
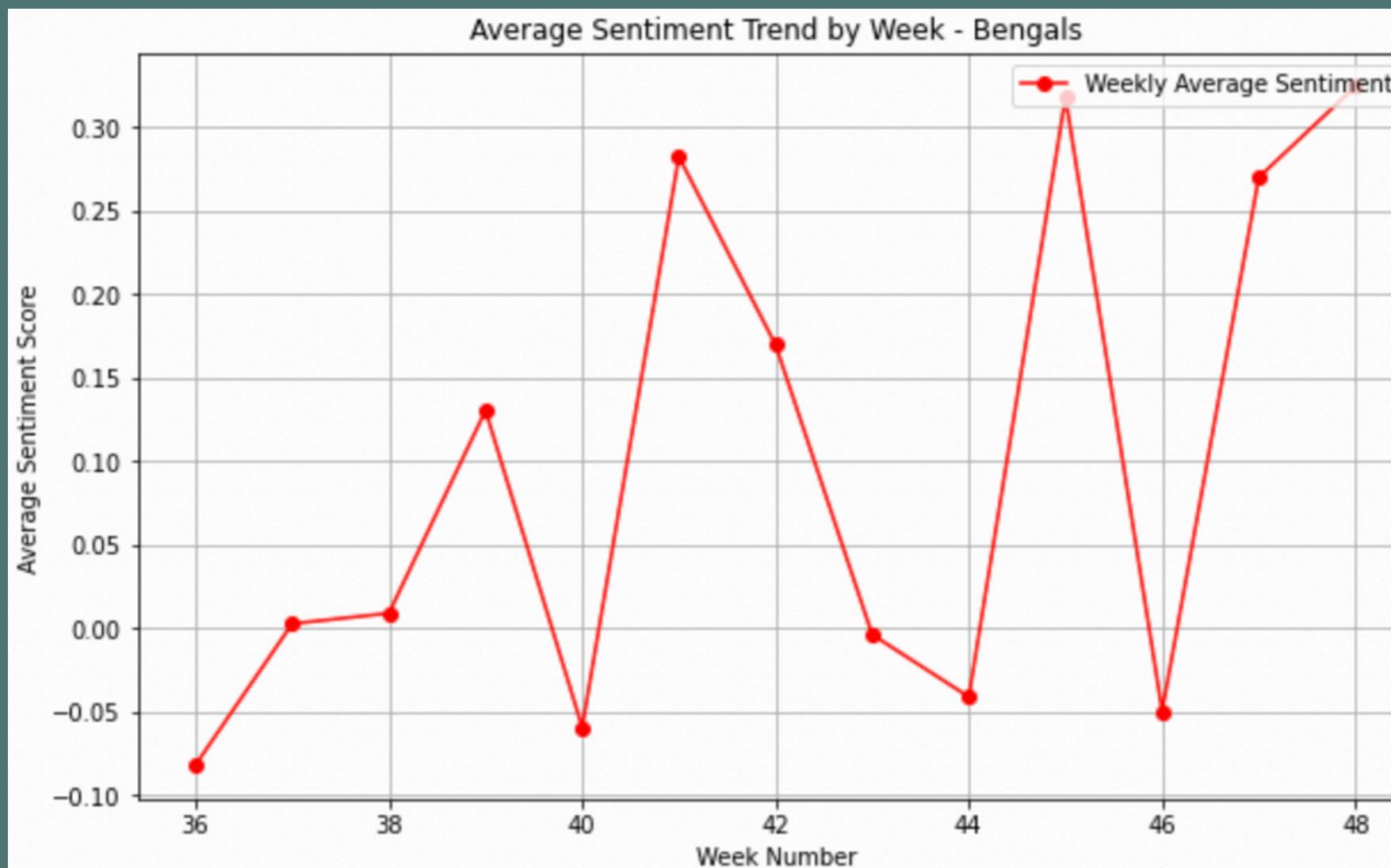
# HOW RECENT USER POSTS CAN BE MEASURED

Total Avg Compounded Sentiment Scores by Week Number

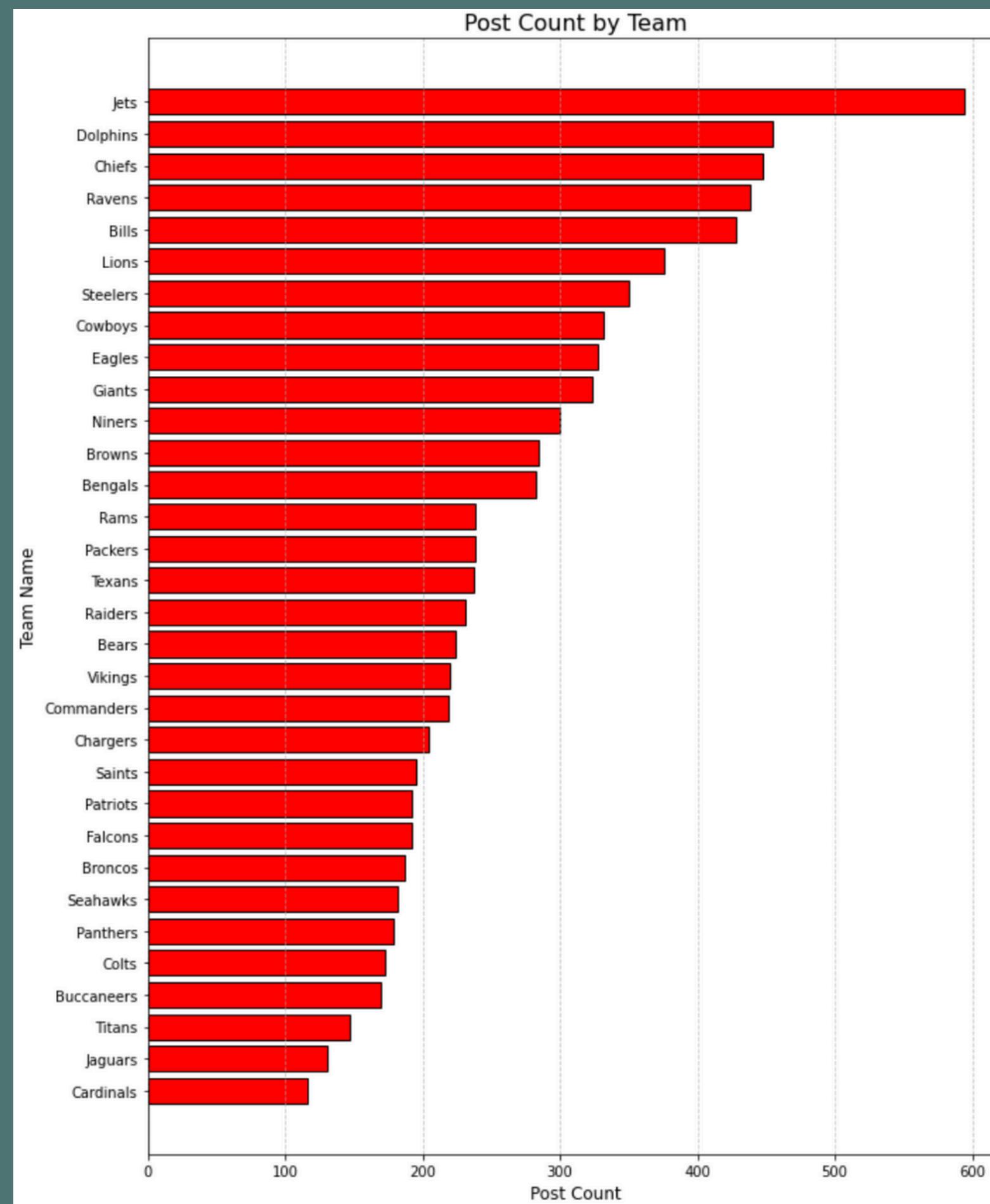


# SENTIMENT ANALYSIS FOR INDIVIDUAL TEAMS

## Bengals      Lions



# DRAMA PERSONIFIED



# DATA FORMAT & MODELING

- Each row is a game in the NFL 2024 season
- Team record, opponent record, home/away, etc..
- Sentiment scores
- Cumulative statistics for each team as well as 3-week moving averages
- Weeks 2-10 for training data
  - 11, 12, and 13 for test data
- **Final Model:**
  - Ensemble of XGB, RF, LR, and SVM

# GAME RESULT PERFORMANCE METRICS

Accuracy: 0.73   Precision: 0.72   Recall: 0.77   F1-Score: 0.74

OVERALL RECORD: 63-23

# TRANSFORMING TO AMERICAN ODDS AND SPREADS

- Derived from win probability
  - Standard implied odds formula
  - Included a 2.5% sportsbook hold
- A higher win probability --> larger spread, vice versa
- Example: Bears @ Lions in Week 13
  - Lions Win Probability: 0.79 ---> -7.5 Point Favorites

# VEGAS DOESNT ALWAYS WIN!

Game (Week 13)	Books	Our Line	Result
TB @ CAR	TB -6	TB -2	TB -3
LV @ KC	KC -13	KC -1.5	KC -2
PIT @ CIN	CIN -3	PIT -3	PIT -6

# VEGAS STILL WINS SOMETIMES...

Game (Week 13)	Books	Our Line	Result
LAR @ NO	LAR -2.5	NO -4.5	LAR -7
IND @ NE	IND -2.5	NE -5.5	IND -1
SF @ BUF	BUF -6.0	BUF -1.5	BUF -25

# RESULTS

OUR SPREADS PERFORMED BETTER THAN VEGAS IN  
**81.25%**  
OF THE GAMES IN WEEK 13

# FUTURE IMPROVEMENTS

- Include more data
- Player Injuries
- Deeper Sentiment Analysis
- Adding Point Total (Over/Under) Lines

# Sports Betting Addiction?

1-800-GAMBLER

**THANK YOU**



# Citations

**GOLDMAN SACHS. (2024, FEBRUARY 7). WHY US SPORTS BETTING COULD BECOME A \$45 BILLION BUSINESS.**  
**[HTTPS://WWW.GOLDMANSACHS.COM/INSIGHTS/ARTICLES/WHY-US-SPORTS-BETTING-COULD-BECOME-A-45-BILLION](https://www.goldmansachs.com/insights/articles/why-us-sports-betting-coULD-BECOME-A-45-BILLION)**

**ST.BONAVENTURE UNIVERSITY. (2024, FEBRUARY 5). ST. BONAVENTURE/SIENA RESEARCH SURVEY REVEALS ALMOST 1 IN 5 AMERICANS HAVE AN ONLINE SPORTS BETTING ACCOUNT.** ST. BONAVENTURE UNIVERSITY. [HTTPS://WWW.SBU.EDU/NEWS/NEWS-ITEMS/2024/02/05/ST.-BONAVENTURE-SIENA-RESEARCH-SURVEY-REVEALS-ALMOST-1-IN-5-AMERICANS-HAVE-AN-ONLINE-SPORTS-BETTING-ACCOUNT#:~:text=About%20online%20sports%20bettors%20from,50%20years%20old%20or%20older](https://www.sbu.edu/news/news-items/2024/02/05/st.-bonaventure-siena-research-survey-reveals-almost-1-in-5-americans-have-an-online-sports-betting-account#:~:text=About%20online%20sports%20bettors%20from,50%20years%20old%20or%20older).

**STATISTA RSEARCH DEPARTMENT. (2024, SEPTEMBER 30). TOPIC: SPORTS BETTING IN THE U.S. STATISTA.**  
**[HTTPS://WWW.STATISTA.COM/TOPICS/8581/SPORTS-BETTING-US#:~:text=As%20of%20September%202024%2C%20there,BILLION%20U.S.%20DOLLARS%20IN%202023](https://www.statista.com/topics/8581/sports-betting-us/#:~:text=As%20of%20September%202024%2C%20there,BILLION%20U.S.%20DOLLARS%20IN%202023)**

# Technical Slide - How teams were separated

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#Below still need to be updated to current information
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    "Raiders": ['Raiders', 'Las Vegas', 'Josh McDaniels', 'Allegiant Stadium', 'Maxx Crosby', 'Silver and Black', 'H
    "Chargers": ['Chargers', 'Los Angeles', 'Justin Herbert', 'Brandon Staley', 'SoFi Stadium', 'Joey Bosa', 'Khalil
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