



# Nuggets Brand Health Project

UC Berkeley Sports Analytics Group

# About Us



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# Denver Nuggets Brand Health



## Goal:

- Develop a quantifiable metric for brand health.
- Come up with a way to track how brand health is changing/has changed over time.

## Progress:

- Scraped 30,000 tweets related to the Nuggets.
- Performed EDA to come up with ideas for a model

## Next Steps:

- More EDA
- Create the final model

# Goals for the Project



1. What new strategies can we use to get accurate brand health measurements?
2. Identify strategies to measure brand health in groups outside of our known ticket buyers

# What is Brand Health?



- Involved fans - fan engagement is indicative of brand health
  - Total fans along with “super fans”
- Sustained Engagement
- Positive/Negative Word Associations
  - Wins/losses, injuries, etc influence number of tweets and engagement of fans.

# Why Social Media?

- Easily access fan opinions and engagement from across the world
- Can reach fans that aren't physically coming to the stadium
- Twitter API is convenient and fast, lots of data that is easily accessible



# Data Collection



- Snscraper from GitHub (@JustAnotherArchivist)
  - Able to scrape tweets based on profiles, hashtags, searches, trends
- Keywords
  - Hashtags: #milehighbasketball, #nuggets
  - Search: Denver Nuggets
- Latest 10,000 results for each scrape (30,000 total tweets)

# Data Preparation

- Extracted word content from all tweets
- Removed common stop words (a, an the, its)
- Gathered associated location data
- Standardized date format for easier analysis

```
['_type', 'url', 'date', 'content', 'renderedContent', 'id',  
'replyCount', 'retweetCount', 'likeCount', 'quoteCount',  
...  
'quotedTweet.quotedTweet.mentionedUsers',  
'quotedTweet.quotedTweet.coordinates', 'quotedTweet.quotedTweet.place',  
'quotedTweet.quotedTweet.hashtags', 'quotedTweet.quotedTweet.cashtags',  
'user.label._type', 'user.label.description', 'user.label.url',  
'user.label.badgeUrl', 'user.label.longDescription'],
```



# Location Analysis

- Less than 1.5% tweets are geotagged (Forbes 2018)
- 970 of 30,000 tweets geotagged (~3.2%)
  - ~366 from Colorado
    - Places containing CO
    - Ball Arena
  - Interesting note: #nuggets
    - 49 tweets with 'Made in Pizza' location
    - Manual scan through shows most relate to Denver Nuggets

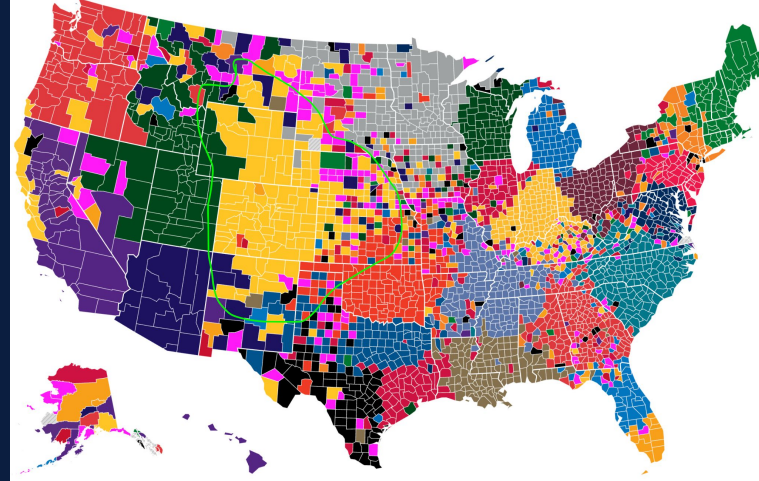


	place.fullName	object	count	int64
	Denver, CO	10%	13	154
	Made in Pizza	10%		
	8 others	80%		
88	Denver, CO		154	
170	Made in Pizza		49	
19	Ball Arena		37	
71	Colorado, USA		26	
316	West Hollywood, CA		25	
51	Casper, WY		22	
12	Arvada, CO		20	
73	Commerce City, CO		17	
166	Littleton, CO		15	
109	Florida, USA		13	

# Location Analysis (cont.)



- Ticket sales data
  - Not particularly useful, makes sense for sales to surround team's state
- Language
  - Some variety of foreign languages, but can't conclude location



<https://www.inc.com/nick-devlin/nba-fan-map-vivid-seats-marketing-strategy.html>

count int64

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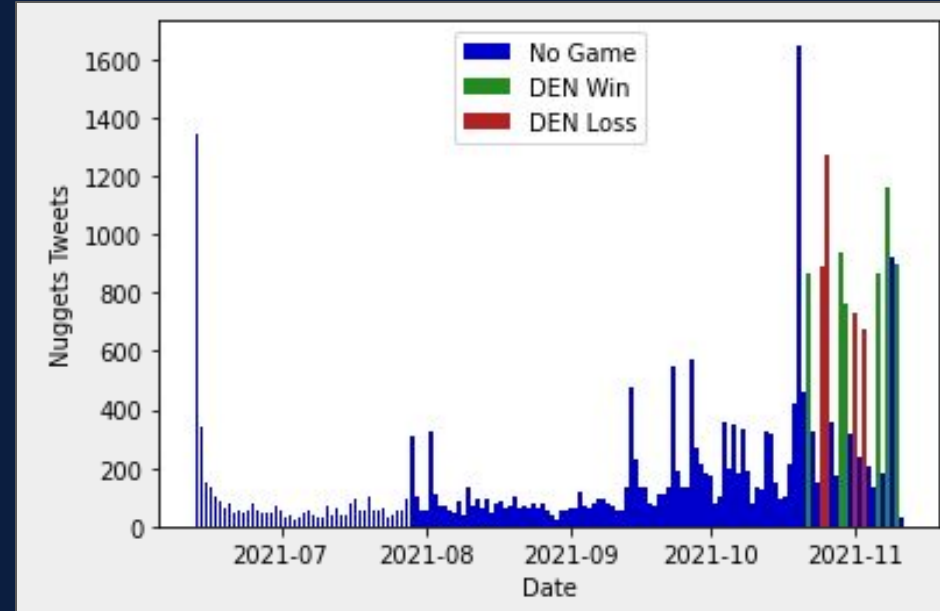
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# Tweet Frequencies

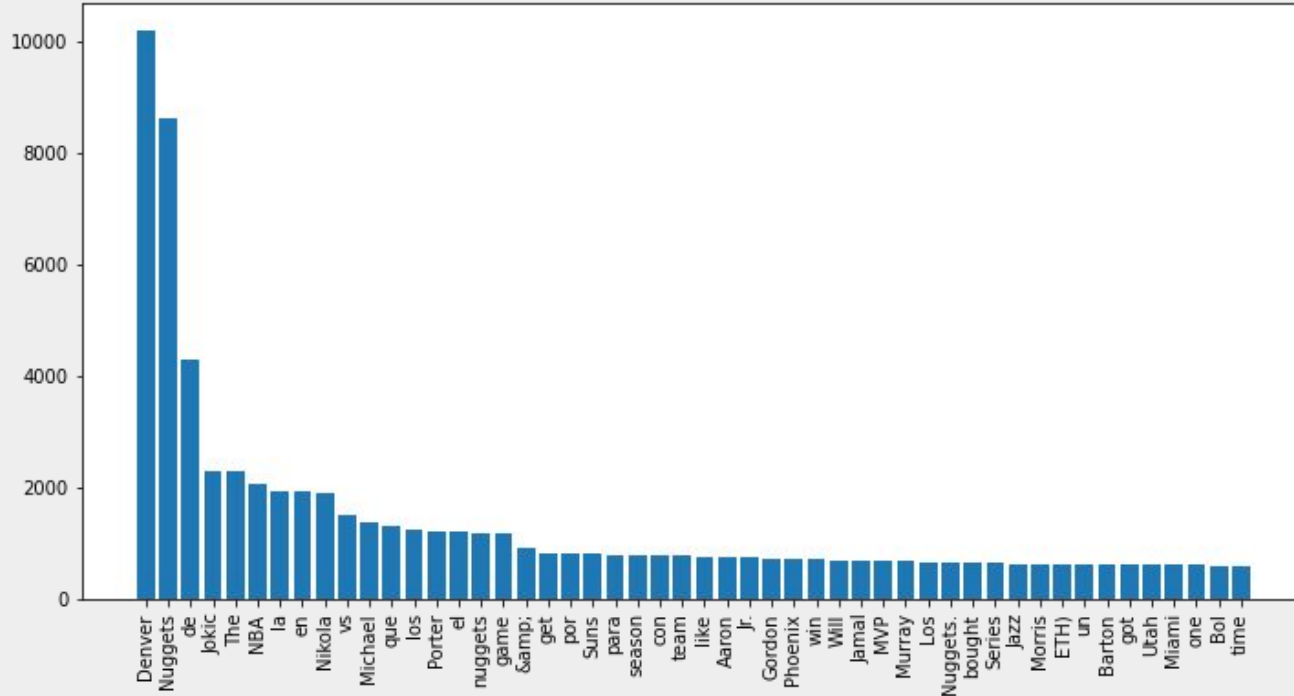


- Nuggets tweets occur most often during games
- However, no notable difference between wins and losses
- Notable points:
  - September spikes: Aaron Gordon and Michael Porter Jr. extensions
  - October spike: first season game
- Large portion within off-season/pre-season time frame



# Word Frequencies

Most Appearing Words in DEN Tweets

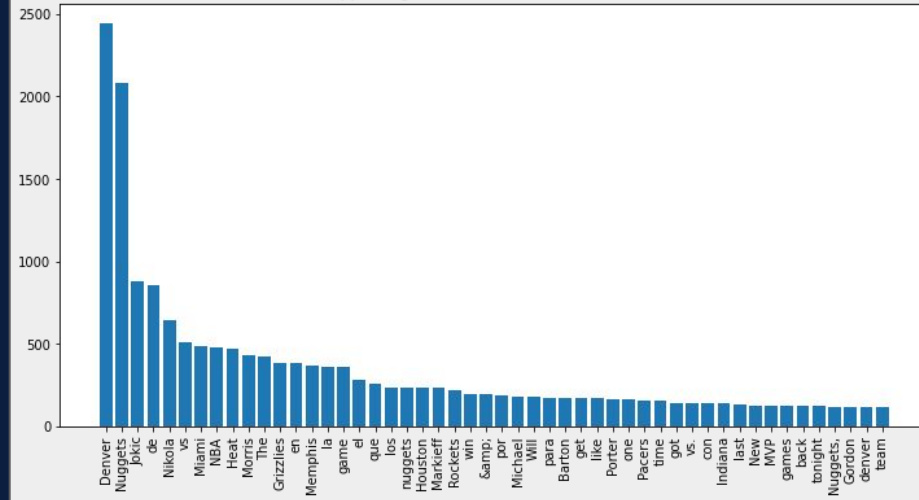


The top appearing words are dominated by player names and Basketball terms. Perhaps the team could use some more unique “catchphrases?”

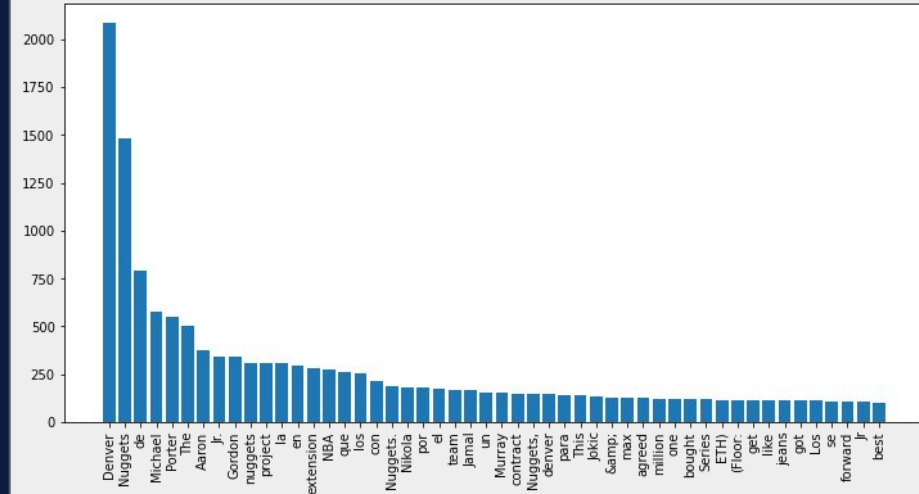
# Word Frequencies by Month

- Michael Porter/ Aaron Gordon vs Nikola Jokic/Markieff Morris
- Denver and Nuggets still lead overall

Most Appearing Words in DEN Tweets from month 11

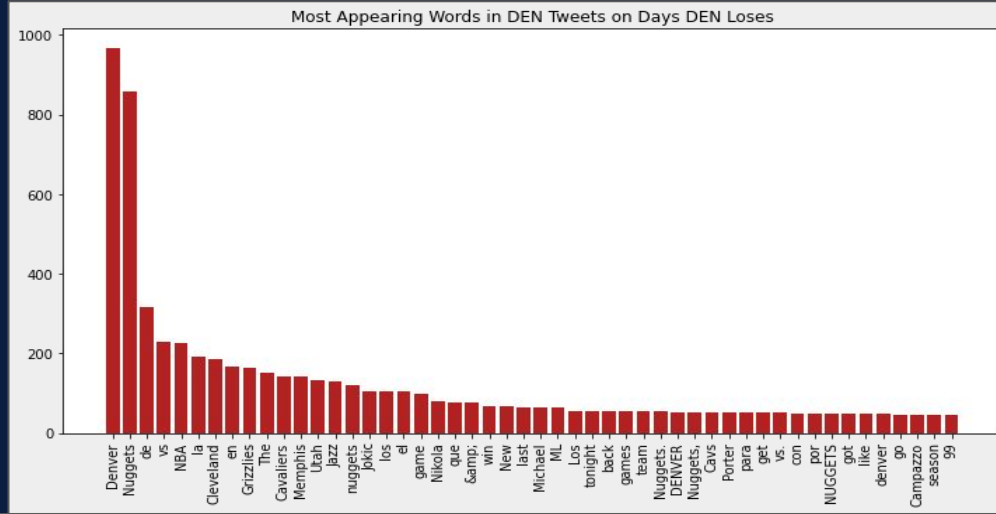
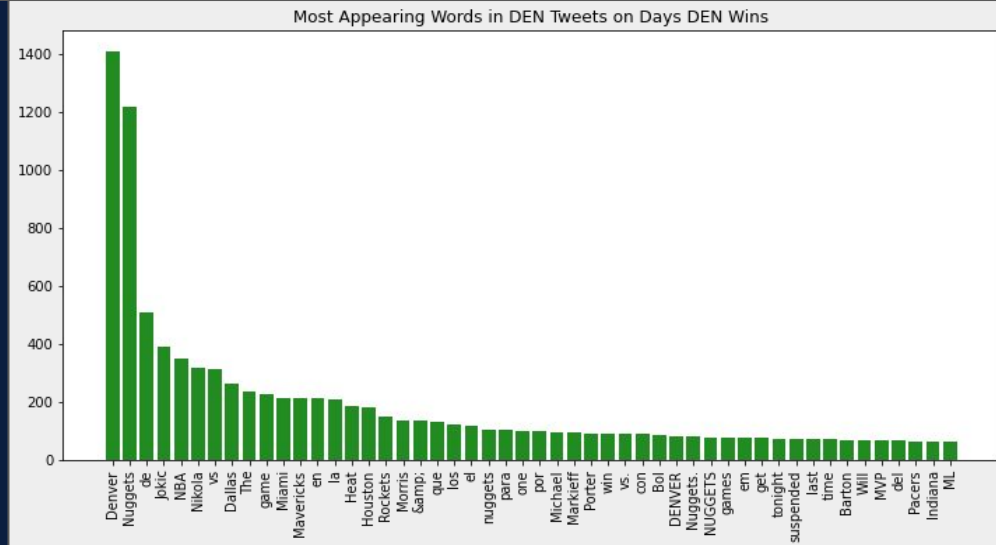


Most Appearing Words in DEN Tweets from month 9



# Word Frequencies by Wins/Losses

- People talk about individual players more when the Nuggets wins
- Slightly more talk of opposing teams when the Nuggets lose
- Relatively similar overall



# Challenges



- Translations
  - Lots of tweets were in other languages
  - Could not get a working translator through Python to remove foreign stop words
- Difficult to only get tweets that relate to the Denver Nuggets
  - Ex. searching by the keyword “nuggets” will lead to some tweets being about chicken nuggets

# Potential Future Plans



- Expand scope of tweets
  - i.e. compare Nuggets vs all NBA twitter activity, Nuggets vs opposing teams, etc.
- Perform sentiment analysis
  - Look at how positive/negative tweets are over time
- Expand to other social media platforms
  - Sites like Reddit could be good for reaching more hardcore fans
- Try to gain information from merchandise sales
  - Trending players, demographics of items bought.