



**Where's your head at?**  
A NLP approach to recommending beer

# Motivation

- Craft beer revenues up over 300% since 2005
- Often seen as exclusive, acquired taste
- Which beer do I get?
- **Goal:** Create a more objective of version of "If you like X, try Y"



# Data

- Reviews from RateBeer.com
  - 2.9M reviews of over 100,000 unique beers between 2003-2013
  - Culled to sample of 100,000 reviews
- Features
  - Beer name, Alcohol by volume, Style
  - Review scores in 6 categories, Date, Review text



**yespr** (55,001)

DK Copenhagen, Denmark

★★★★★ 3.5 October 3, 2007

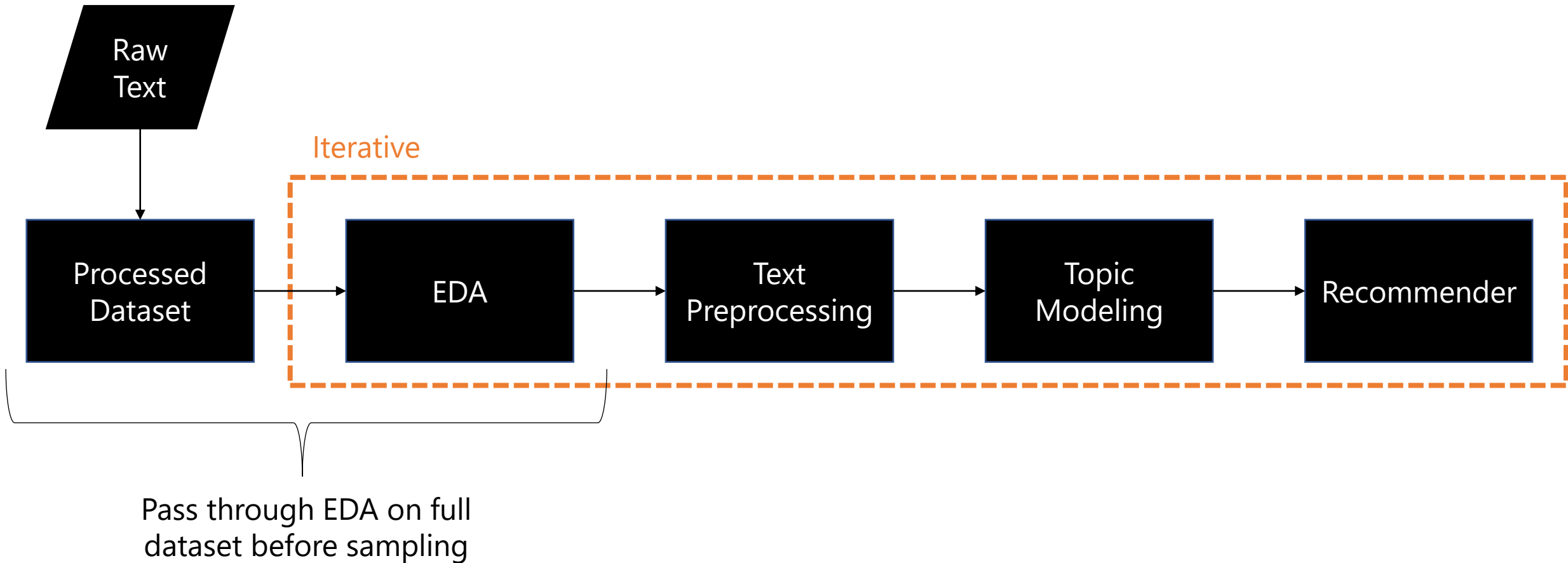
1 pint from tap in Heathrow airport. Pours black with a brown head. Aroma is rather mildly malty, slight roasted. Smooth mouthfeel. Flavour is roasted malty with a minor sweet note and slight citric note breaking through the otherwise very smooth beer. Ends is a slight roasted bitterness. Nice.

[Show less](#) ^

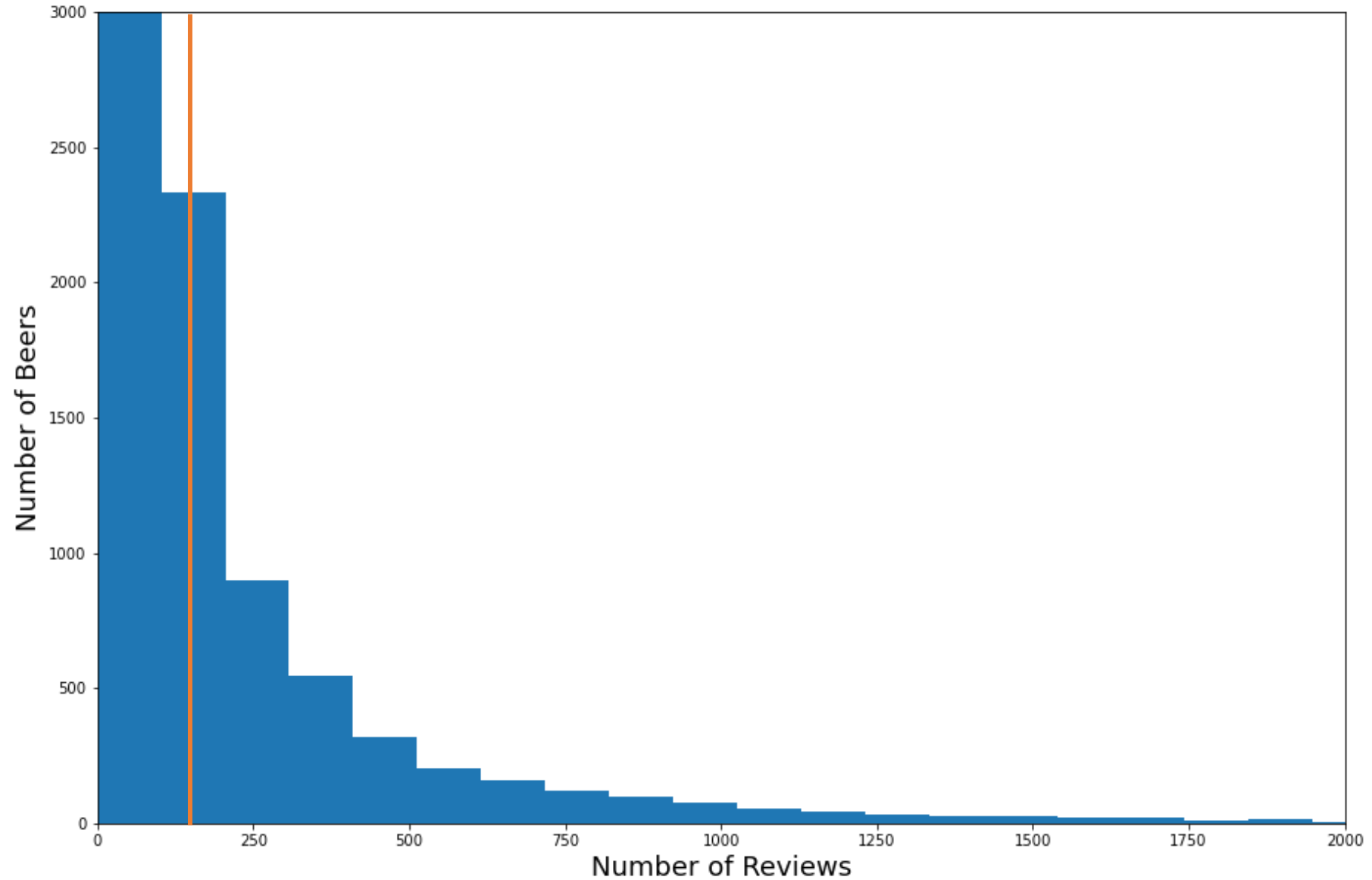


Aroma	<div><div></div></div>	5
Appearance	<div><div></div></div>	5
Flavor	<div><div></div></div>	7
Mouthfeel	<div><div></div></div>	4
Overall	<div><div></div></div>	14

# NLP Workflow



# Sampling Data



# Processing Text

- spaCy Workflow
  - Tokenize
  - Filter unwanted characters
  - Remove stop words
  - Lemmatize
- Vectorize
  - CountVectorizer
  - TF-IDF
  - Tune ngram range, min/max doc frequency

# Topic Modeling

- Baseline Models
  - NMF
  - CorEx
- Iterate back to preprocessing, tune parameters
- Challenges with muddy topics  
-> anchored CorEx





# Topic Modeling



**SCORE CARD**

BREWERY NAME: \_\_\_\_\_

CITY / COUNTRY: \_\_\_\_\_

STYLE: \_\_\_\_\_

HEAD / LACING: 1 2 3 4 5  
THIN ← → THICK

AROMA: 1 2 3 4 5  
SIMPLE ← → COMPLEX

TASTE: 1 2 3 4 5  
CLEAN ← → BITTER

BODY: 1 2 3 4 5  
LIGHT ← → FULL

FINISH: 1 2 3 4 5  
HARSH ← → SMOOTH

QUALITY: 1 2 3 4 5  
BELOW AV ← → SUPERIOR

NOTES: \_\_\_\_\_

**TOTAL POINTS** (out of 30) \_\_\_\_\_

## Dark Styles

- Chocolate
- Coffee
- Black
- Dark
- Brown

## Light Styles

- White
- Citrus
- Orange
- Hazy
- Cloudy

## Serving

- Head
- Pour
- Aroma
- Bottle
- Lacing

## Mouthfeel

- Body
- Medium
- Finish
- Carbonation
- Mouthfeel

## Tasting Notes

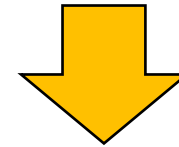
- Malt
- Hop
- Sweet
- Bitter
- Fruit



# Recommender

- Building content-based recommender
  - Merge topic features with review scores
  - Input a beer, calculate cosine similarity
  - Returns top 5 most similar beers

Input: Blue Point Hoptical Illusion



## Recommendations

New Belgium Belgo IPA
Great Divide Fresh Hop Pale Ale
Three Floyds Pride & Joy Mild Ale
Oskar Blues Gubna Imperial
Alpine Beer Company Pure Hoppiness

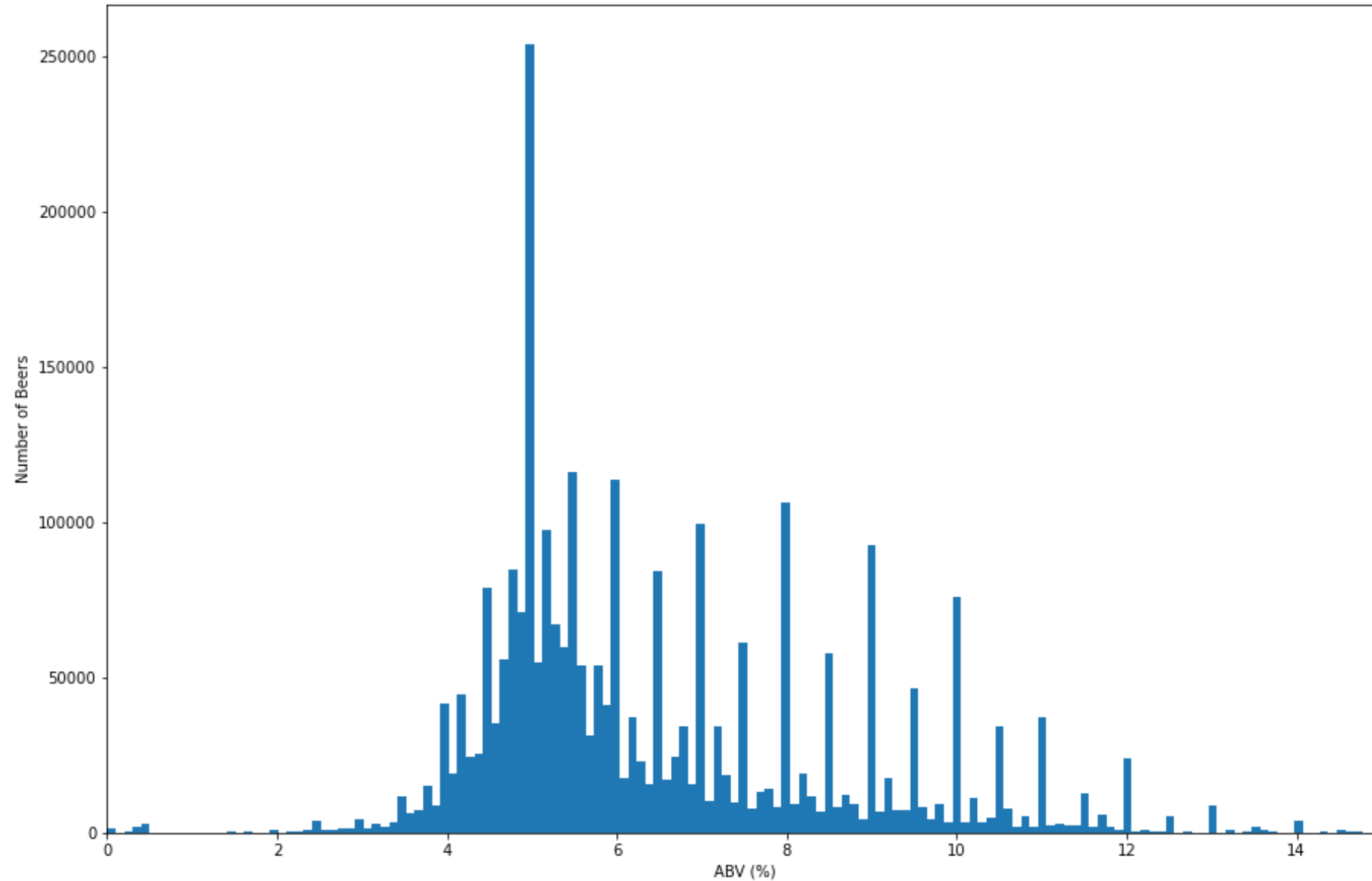
# Future Work

- Run on full set of reviews with less strict filtering
- Physical distance feature
- Develop pipeline to handle submission of text for recommender

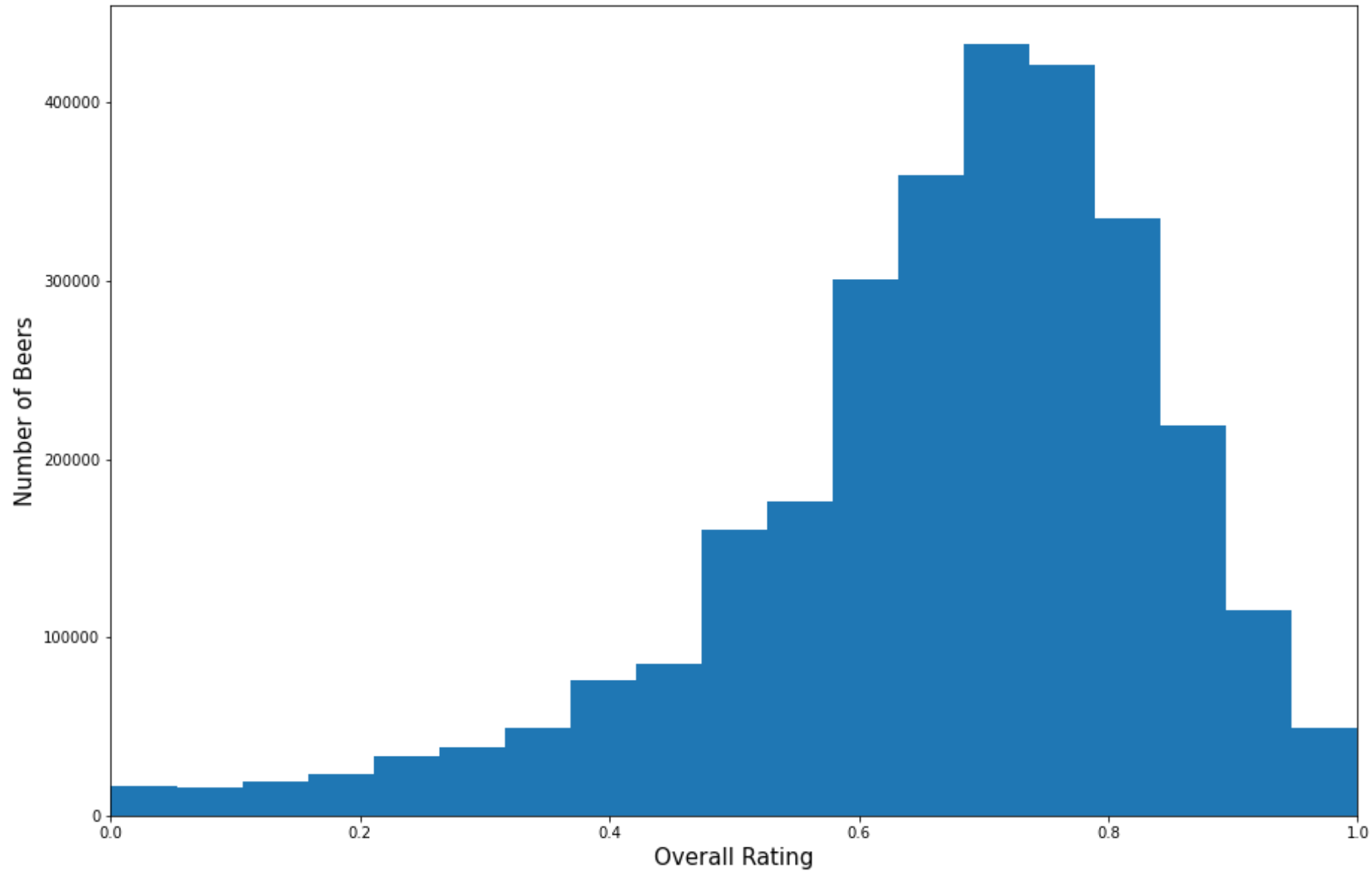
Questions?



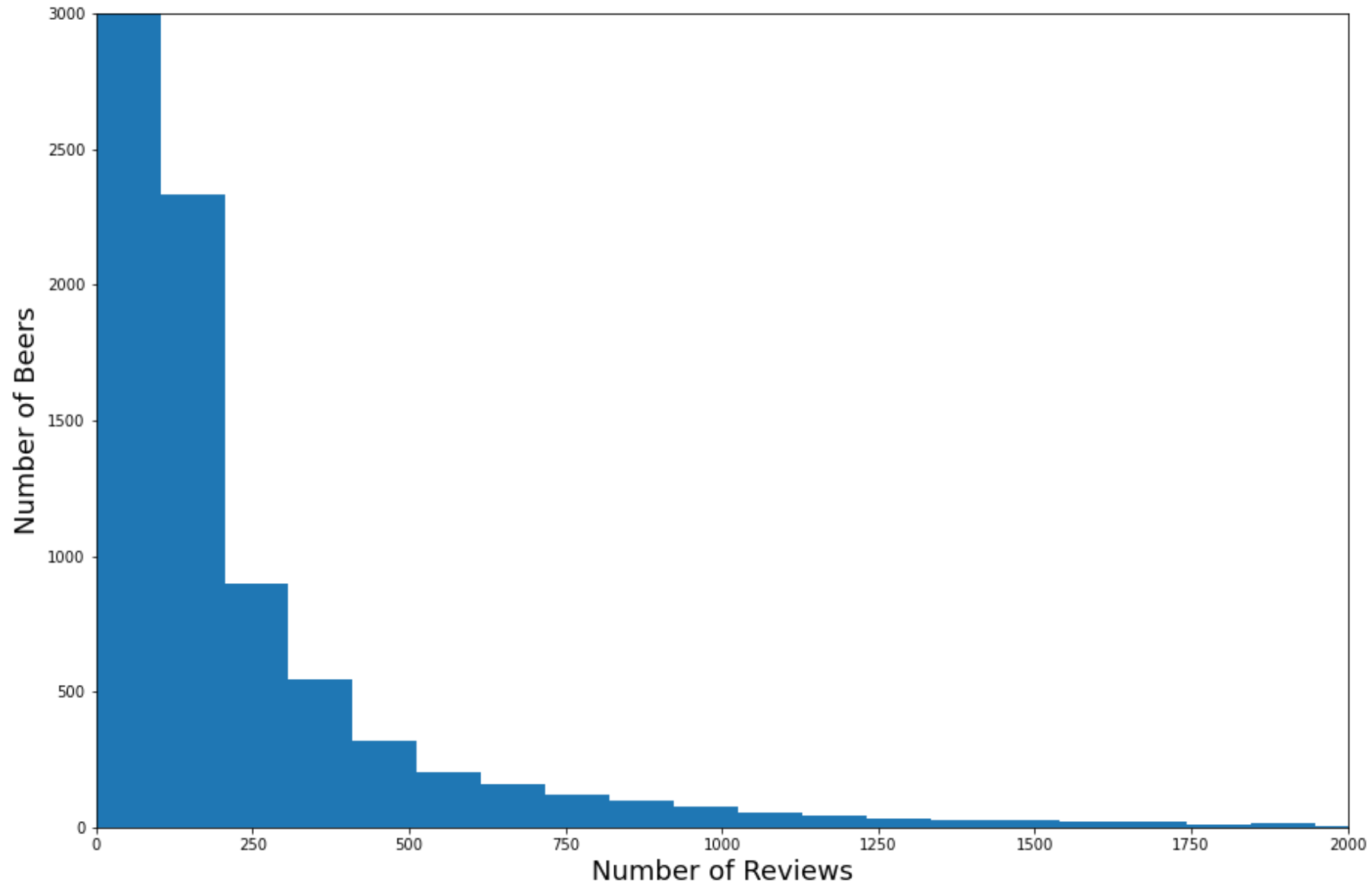
# Appendix



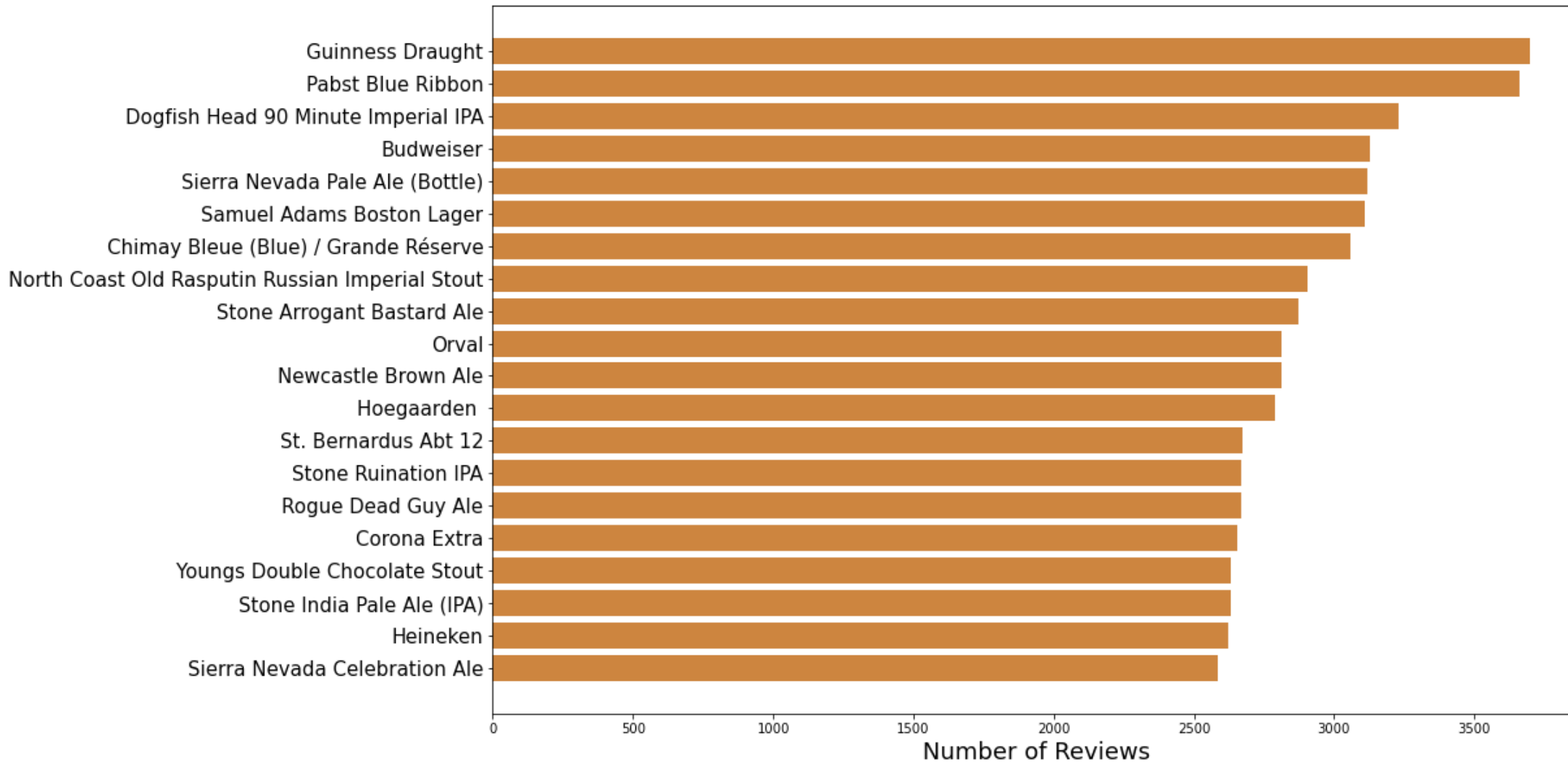
# Appendix



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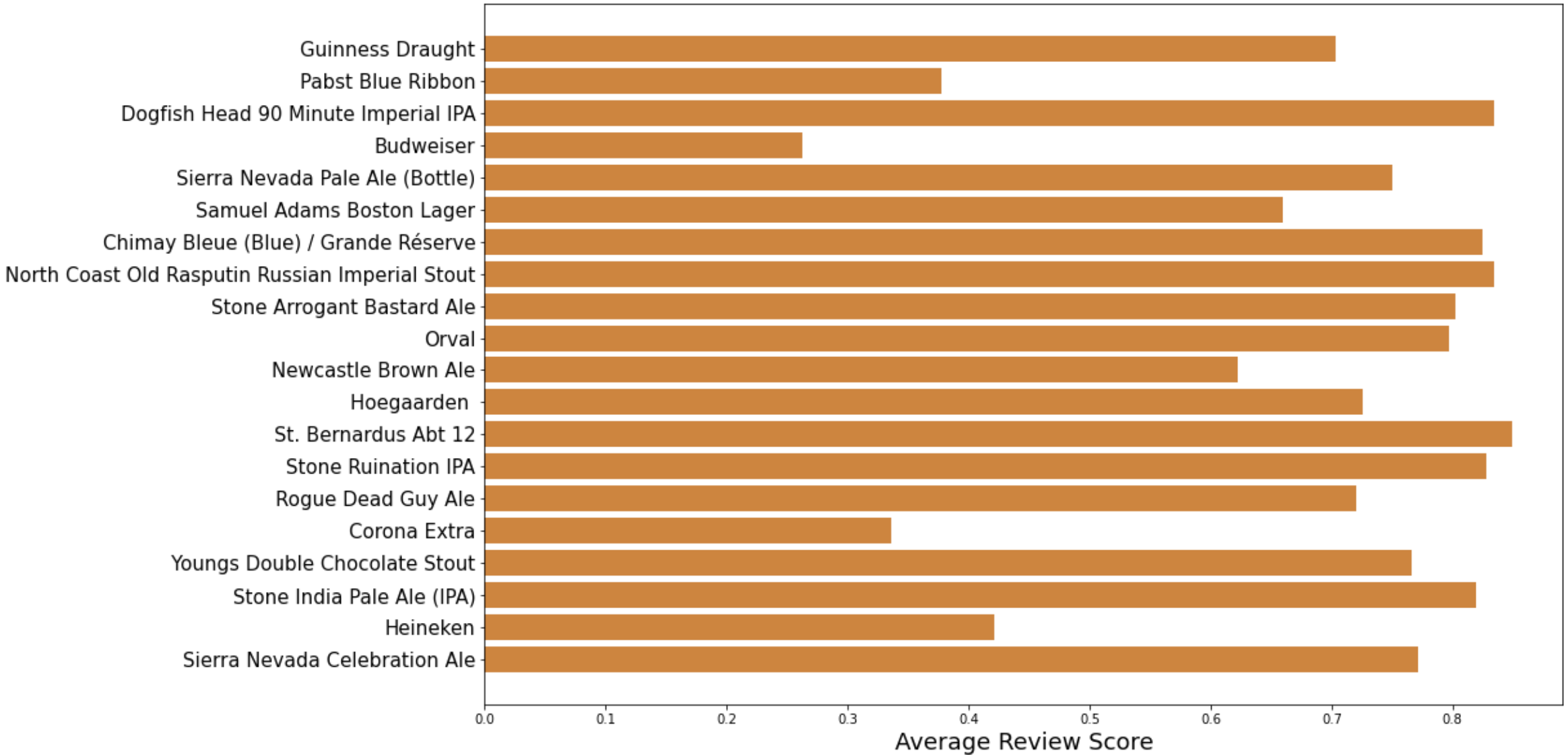


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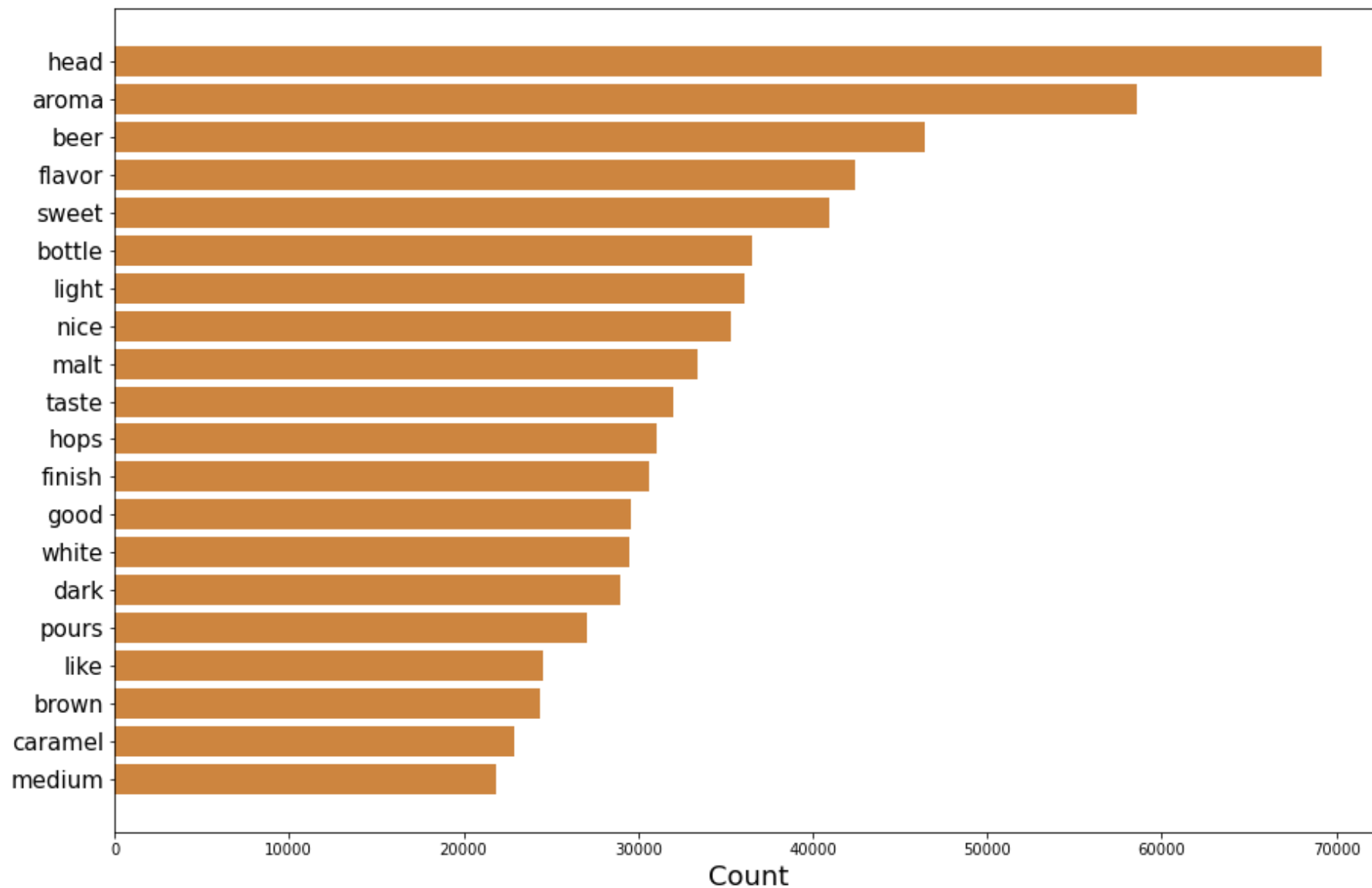




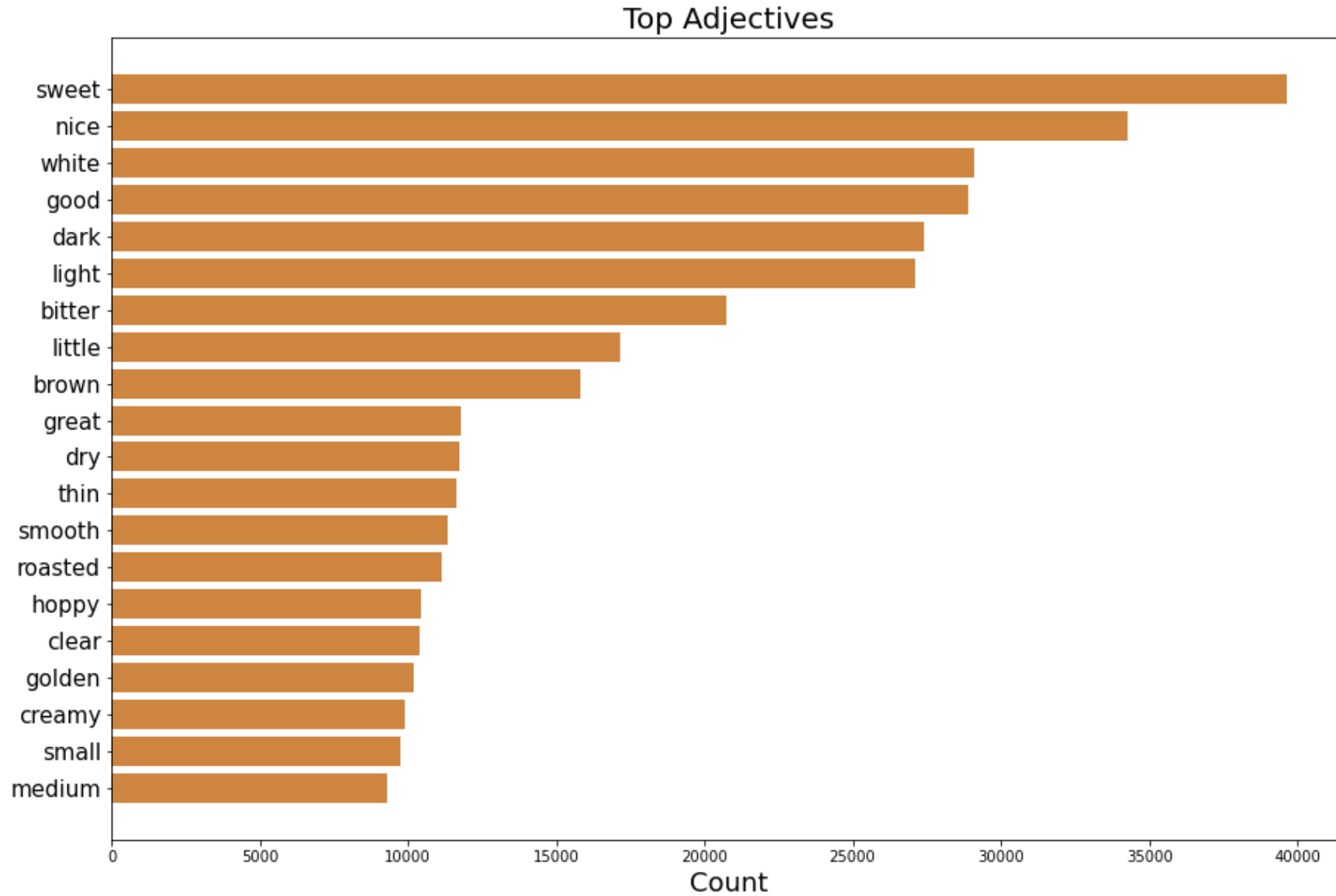
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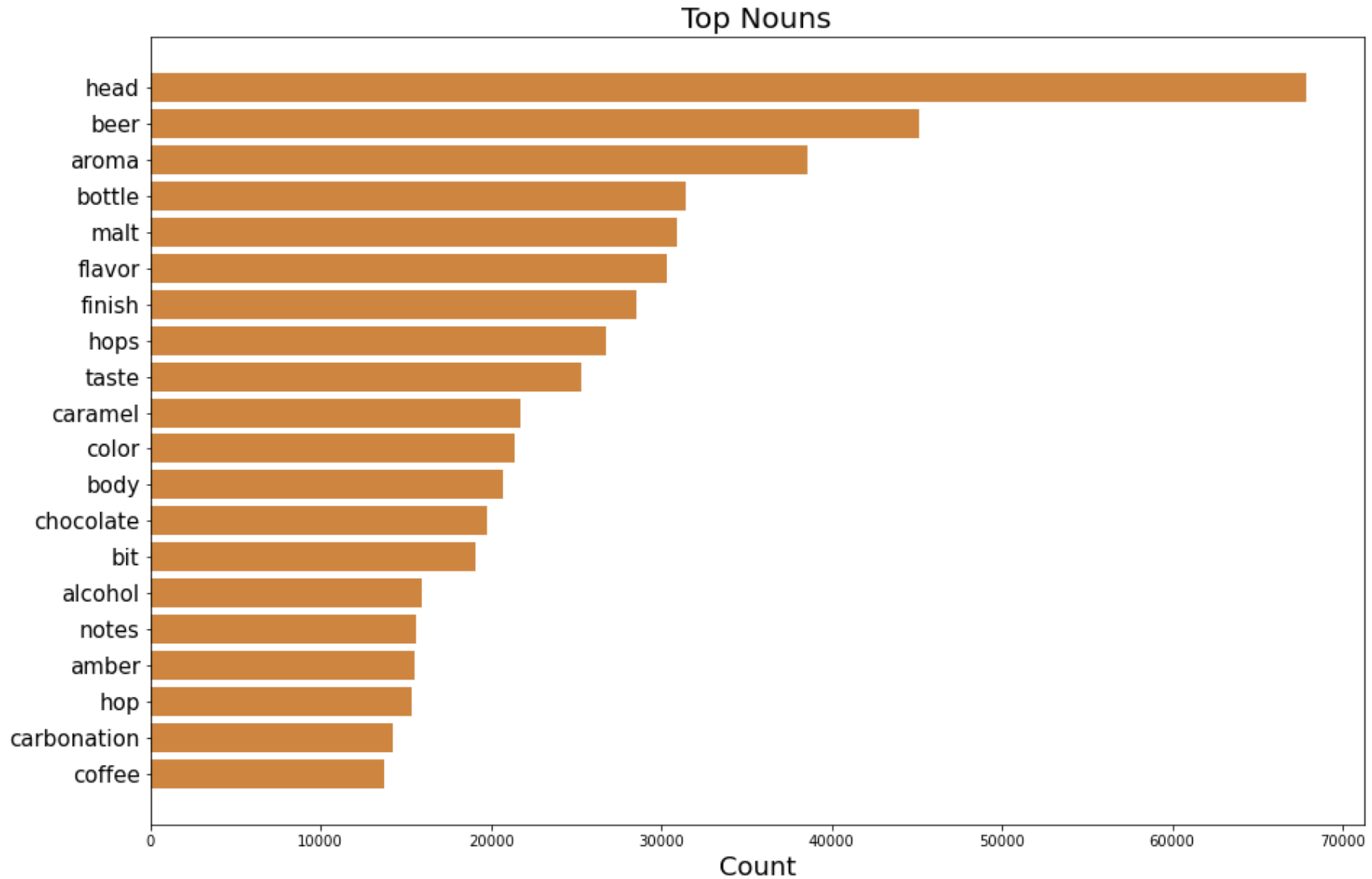
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