

# Beer Recommendation Engine Project Report

Justin Bates  
March 1st, 2021

# Hello!



My name is Justin Bates

## **I am a Data Scientist for ProductOps**

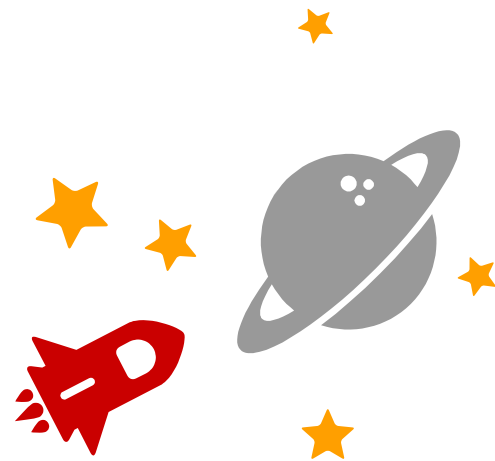
I am here to show you my work on a  
beer recommendation engine

# Big concept

*What is a recommendation system?*

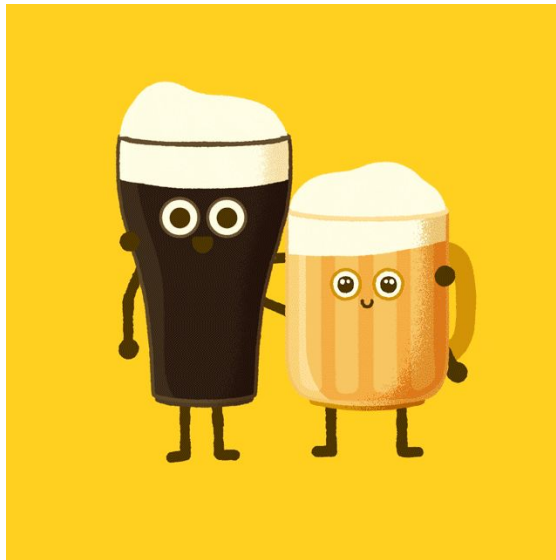
It's a system that recommends things.

- Products
- Services
- Anything really.



“

*In this case we want to recommend...*



# Now Lets Begin

# Web Scrapping



BeautifulSoup

**Beeradvocate**<sup>®</sup>



 **35,552**

That's a lot of user.

**Users**

 **10,465**

And a lot of beer.

**Beers**

 **4,026,233**

Sooooo many ratings.

**Ratings**

# EDA





review\_count  
32,505,546

30.44%

rating\_count  
106,782,459

Average Beer Rating

3.7934

Beer Count

11,267

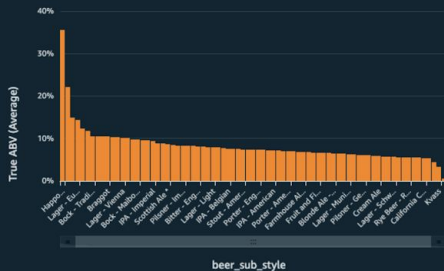
Brewery Count

2,243

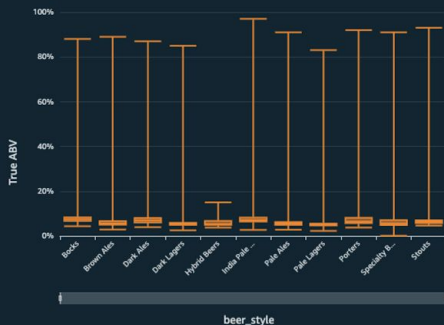
User Count

29,859

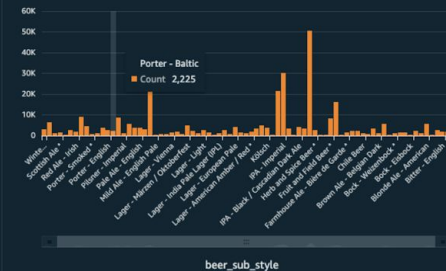
Average of ABV by Beer Styles



Average of ABV by Beer Styles



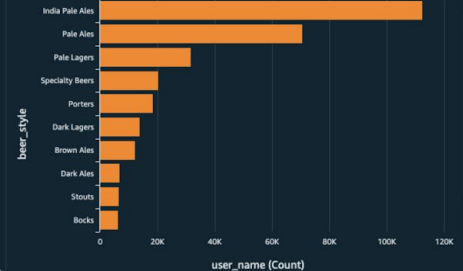
Beer Count by Beer Styles



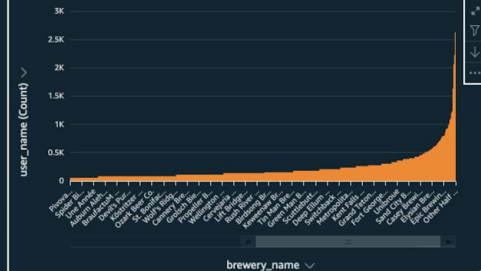
Rating by Beer Styles



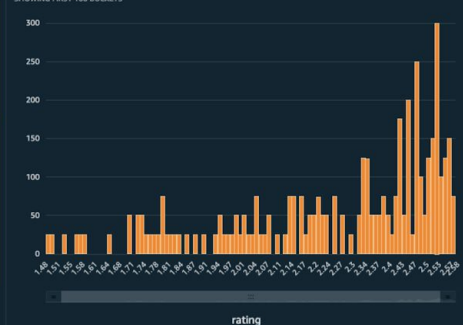
User Count by Beer Styles



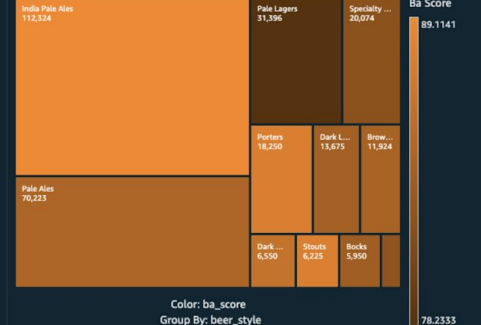
User Count by Brewery



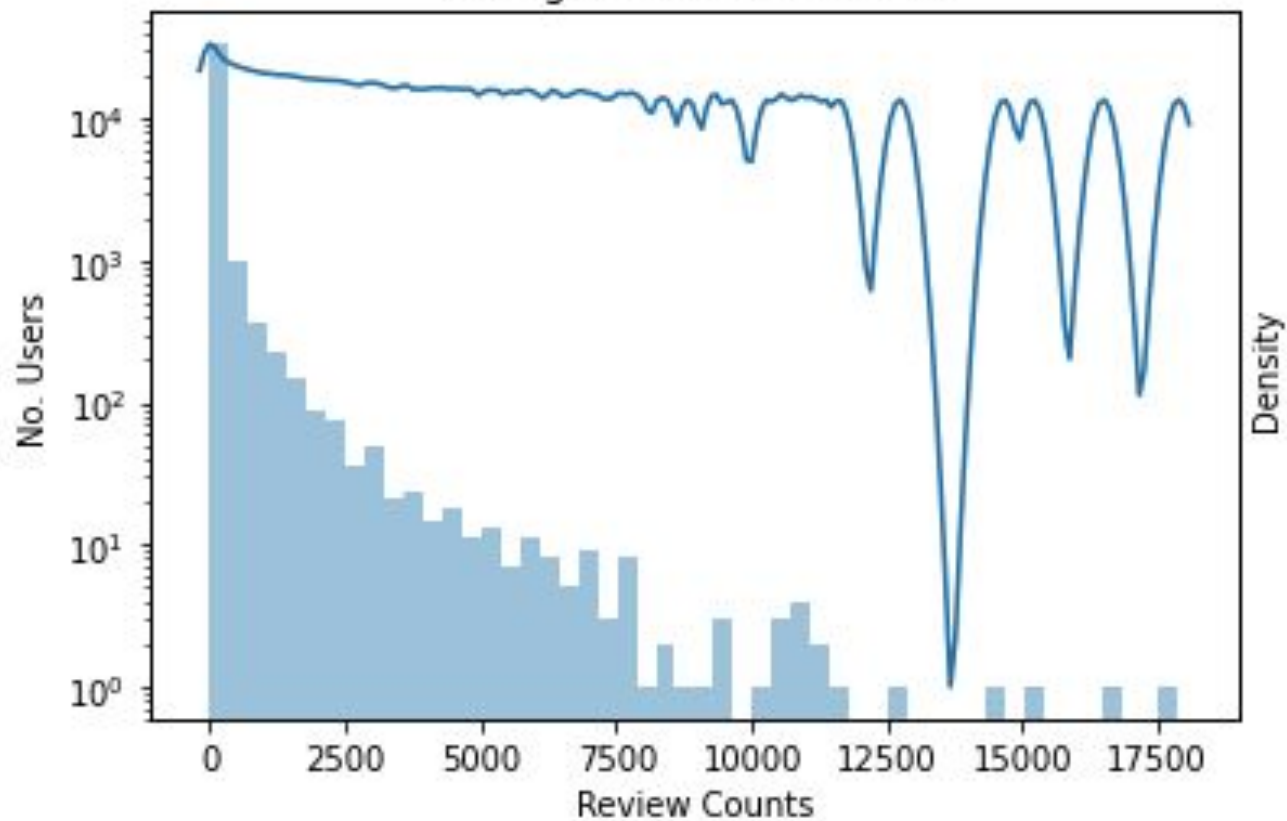
Average of ABV by Beer Styles

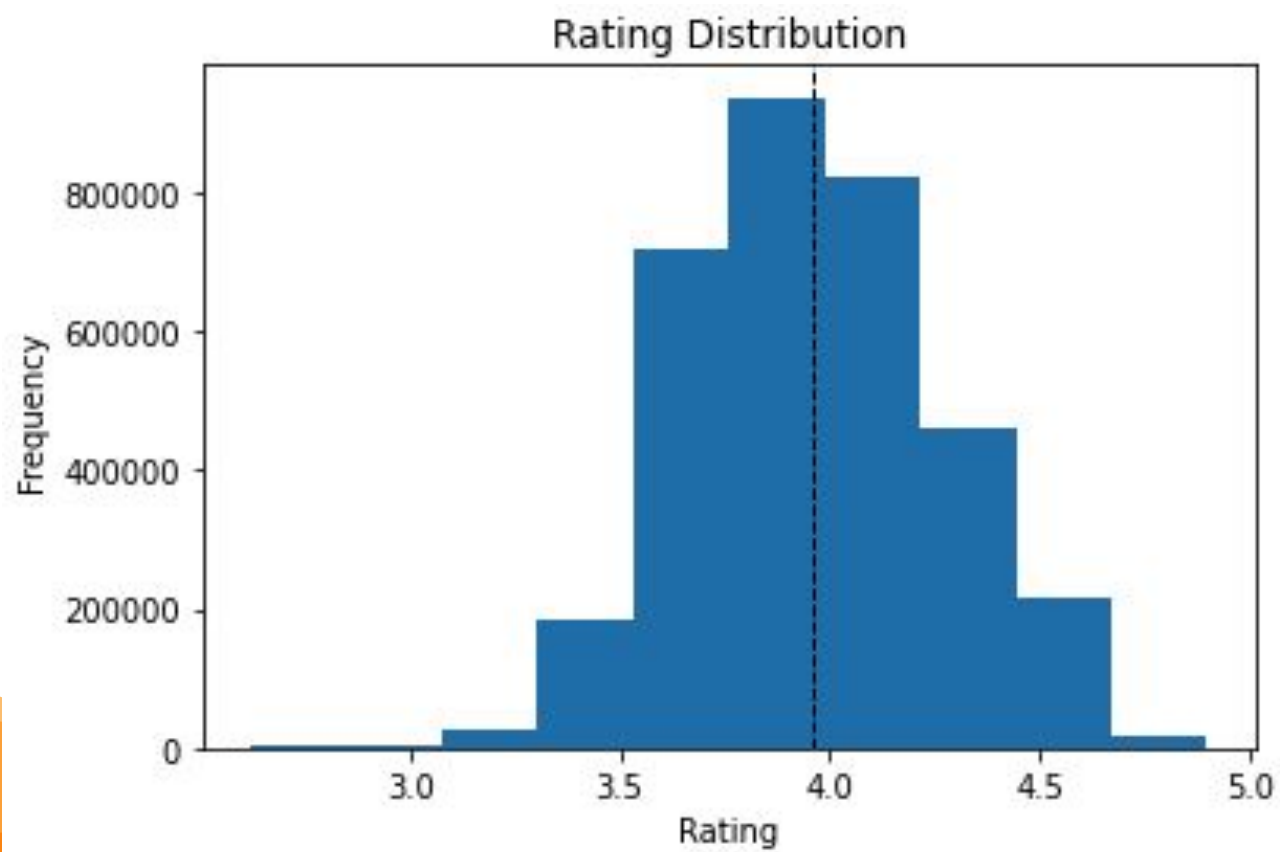


User Count by Brewery



# Histogram of User Counts







# surprise

# Models - Via Surprise

## KNN

### Nearest Neighbors Approach

- A basic collaborative filtering algorithm taking into account a baseline rating.

## SVD

### Latent Factors Approach

- When baselines are not used, this is equivalent to Probabilistic Matrix Factorization.

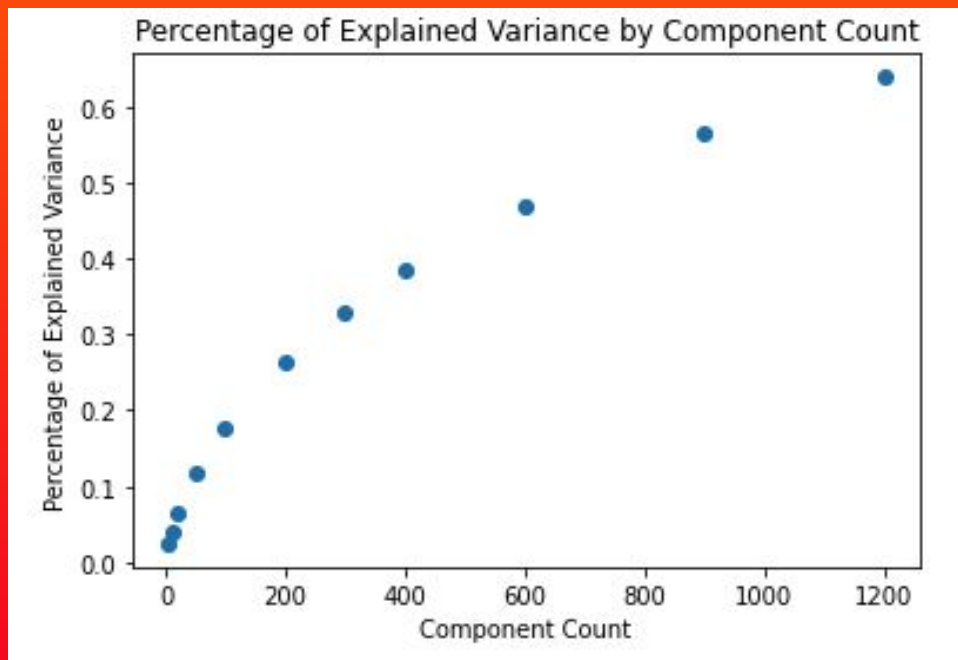
# Models - KNN

## 5-Fold Cross Validation

	Fold 1	Fold 2	Fold 3	Fold 4	Fold 5	Mean	Std
RMSE	0.1319	0.1321	0.1314	0.1316	0.1315	0.1317	0.0003
MAE	0.0548	0.0549	0.0546	0.0547	0.0547	0.0547	0.0001

# Models - SVD

# Explained Variance



# Models

## Similarities

```
1 get_top_n('Samuel Adams Boston Lager', 40)
```

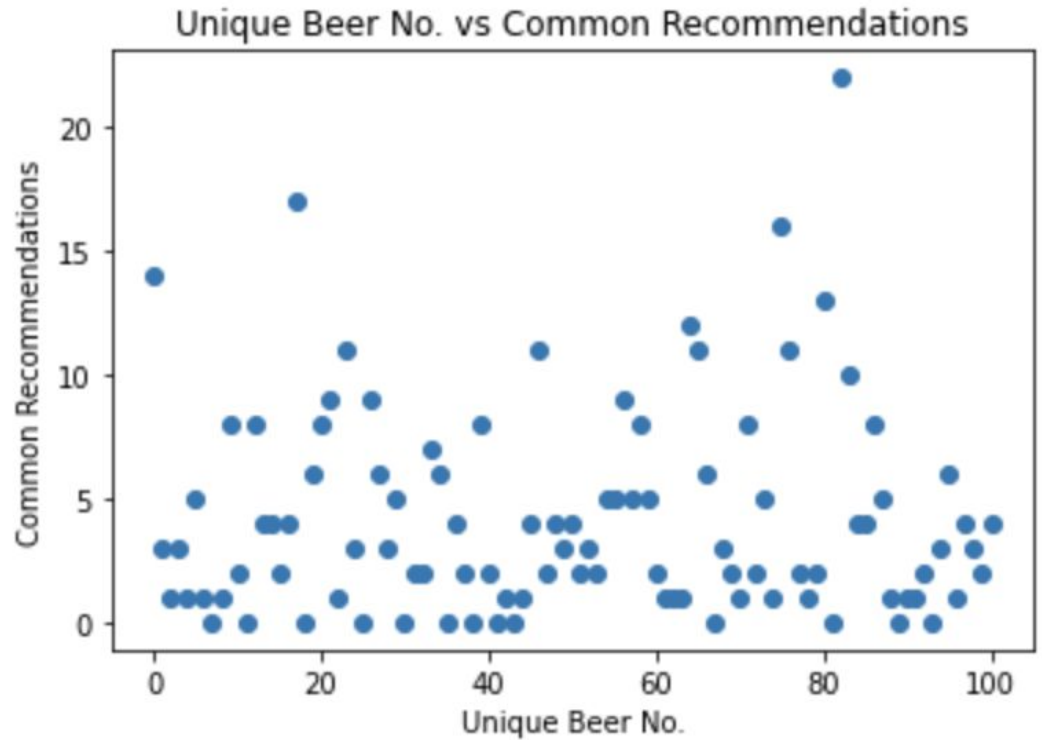
```
['Nugget Nectar',  
'The Abyss',  
'Three Philosophers',  
'Punkin Ale',  
'Traditional Lager',  
'Dragon's Milk',  
'Bomb!',  
'Orval Trappist Ale',  
'Samuel Adams Summer Ale',  
'#9',  
'Ayinger Celebrator',  
'Péché Mortel',  
'Maudite',  
'Mirror Pond Pale Ale',  
'Leffe Blonde',  
'Kellerweis',  
'Raging Bitch',  
'Hop Head Red Ale',  
'Vitus',  
'Old Stock Ale',  
'Banana Bread Beer',  
'Troegenator',  
'The Sixth Glass Quadrupel Ale',  
'Best Brown Ale',  
'Hopback Amber Ale',  
'Flipside Red IPA',  
'Warlock',  
'Tap 9 Aventinus Eisbock',  
'Gonzo',  
'East IPA',  
'London Porter',  
'Red Chair NWPA',  
'Pannepot',  
'Blushing Monk',  
'La Trappe Quadrupel (Koningshoeven / Dominus)',  
'Skull Splitter',  
'Ayinger Bräuweisse',  
'Raspberry Tart',  
'Chainbreaker White IPA',  
'India Ale']
```

```
1 svd900_top_n('Samuel Adams Boston Lager', 40)
```

```
['Fat Tire Amber Ale',  
'Negra Modelo',  
'Samuel Adams Oktoberfest',  
'Hoegaarden Original White Ale',  
'Goose IPA',  
'Anchor Porter',  
'Traditional Lager',  
'Dead Guy Ale',  
'Guinness Foreign Extra Stout',  
'Kalamazoo Stout',  
'Anchor Steam Beer',  
'Snowdrift Vanilla Porter',  
'Samuel Adams Cold Snap',  
'Samuel Adams Winter Lager',  
'Born Yesterday',  
'Pilsner Urquell',  
'Hofbräu Original',  
'Blue',  
'Baltimore Blonde',  
'Edmund Fitzgerald',  
'Ten FIDY',  
'Bigfoot',  
'Solid Gold',  
'Hazelnut Brown Nectar',  
'Smithwick's Imported Premium Irish Ale',  
'Sublimely Self-Righteous Black IPA',  
'Midnight Lager',  
'Boddingtons Pub Ale',  
'Dragon's Milk',  
'Erdinger Weissbier (Hefe-Weizen)',  
'Xocoveza',  
'Blue Moon Harvest Pumpkin Wheat',  
'Samuel Adams Summer Ale',  
'Taddy Porter',  
'Black Butte Porter',  
'Samuel Adams Alpine Lager',  
'Hefe-Weissbier Naturtrüb',  
'Dirty Bastard',  
'Grolsch Premium Lager',  
'Prima Pils']
```



# Models Similarities



# Questions

