COFFEE
?
(redux)
WHO LOVES...

Our Extremely Over Caffeinated Team:

"More Chai"
Priya Singh

"Cool as Iced Mocha"
Banke Ogunjumo

"A hot cup of Weiner Melange and a babysitter is all I need "
Galyna Malynska

"Molti macchiatos per favore"
Michael Liu

"Civet Coffee, uh-uh!"
Jasper Chou

Continuation of our Analysis on the retail coffee industry for selected metro areas

- Sentiment Analysis based on Yelp reviews
- Success of retail coffee business
- Retail coffee shop clustering
- Coffee shop rating prediction

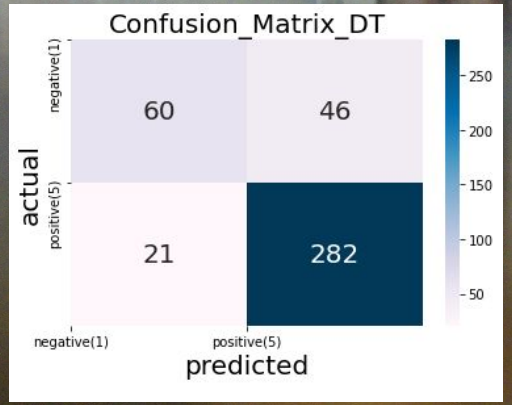
Again...The Supplier of Our Data

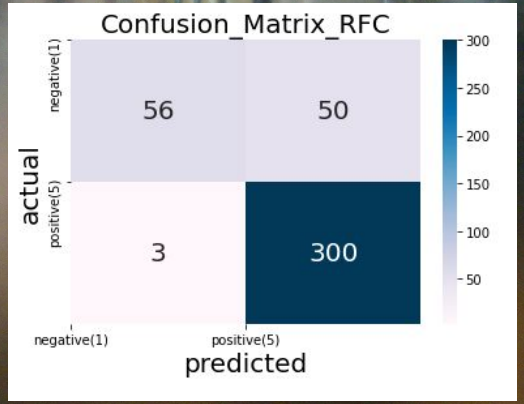
Sentiment Analysis based on Yelp reviews

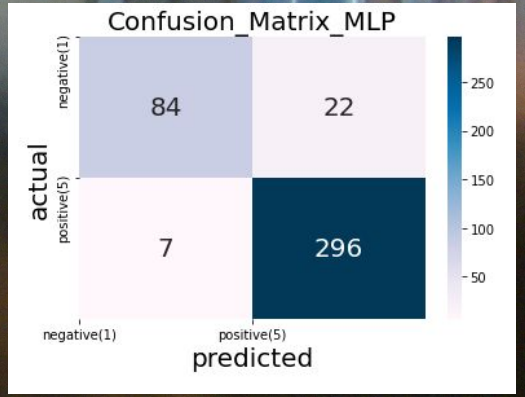
Accuracy Score Decision Tree: 83.13%

Accuracy Score Random Forest: 86.31%

Accuracy Score Multi-layer Perceptron: 92.67%







Sentiment Analysis Based On Yelp reviews

Prediction Of Rating Based On Reviews

Positive Review from Yelp:

Had them through Uber Eats and it was amazing! We got the pork belly & meatball banh mi, it was so flavorful. We also got the m
acarons and millefeuille, perfect and light desserts to finish the meal. Don't understand the bad reviews, it's a great meal at
a cheap price.
Actual Rating: 5.0
Predicted Rating:

5.0

Sentiment Analysis Based On Yelp reviews

Prediction Of rating Based On reviews

Negative Review from Yelp:

The drive thru is always long, and the staff just hands me their pin pad to insert my card, and then I always have to enter a p in. I'd rather run credit than debit, especially sitting in my car, lower than the window, and being outside of the building. C an you help me out here staff? I know you're following corporate standards for pin protection, but maybe you need to contest co rporate policy for customer satisfaction. Other locations are swiping my card for me, why are you not? I hear, "we can't do tha t" or "its policy", and the famous, "well if you had the app"... that one pisses me off.

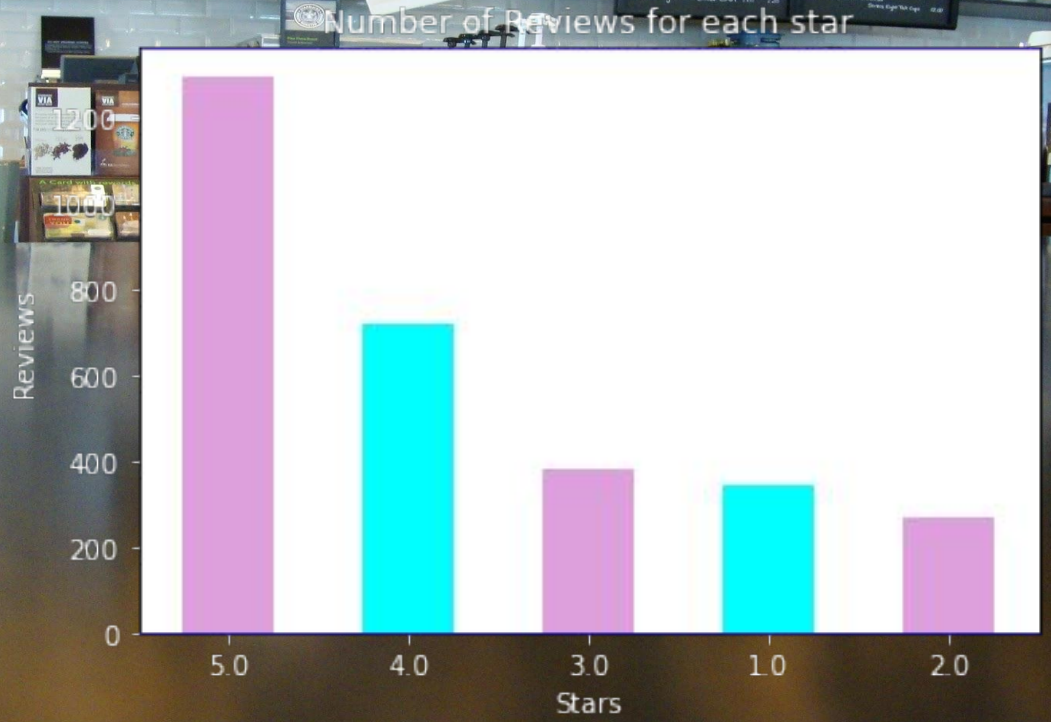
You know what? An app will replace you with that response, and quite possibly a vending robot. Smile and swipe my card, I'm pay ing your salary.

Actual Rating: 1.0

Predicted Rating:

5.0

Sentiment Analysis based on Yelp reviews



Predict Coffee Shop Successfulness

Compare the Performance of different Models

```
Logistic Regression scores:

Training Score: 0.7379569375900773
Testing Score: 0.7387658849731429
Accuracy:  0.7387658849731429
Precision:  0.7407896474316651
Confusion Matrix:
 [[  29 1963]
 [  31 5610]]
```

```
Decision Tree Classifier scores:

Training Score: 1.0
Testing Score: 0.9337088955849601
Accuracy:  0.9337088955849601
Precision:  0.9592201752817028
Confusion Matrix:
 [[1764  228]
 [ 278 5363]]
```

```
Adaptive Boosting Classifier scores:

Training Score: 0.7557758658339521
Testing Score: 0.7513428533997117
Accuracy:  0.7513428533997117
Precision:  0.7701746787931283
Confusion Matrix:
 [[ 400 1592]
 [ 306 5335]]
```

```
Random Forest Classifier scores:

Training Score: 1.0
Testing Score: 0.7581553779641033
Accuracy:  0.7581553779641033
Precision:  0.8016213638531235
Confusion Matrix:
 [[ 744 1248]
 [ 598 5043]]
```

Predict Coffee Shop Successfulness

Features Selection

- Limit Features by selecting Coffee Shops Attributes.
- Is Coffee Shop a part of chain?
- Coffee Shop age based on the last and first Review.
- Average Monthly Reviews Count for Coffee Shop.
- Counts of Tips.

pandas

SQL

Predict Coffee Shop Successfulness

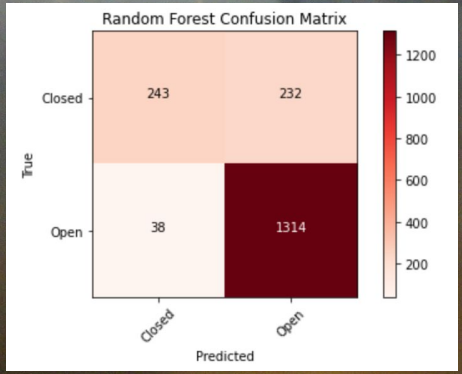
	latitude	longitude	stars	review_count	is_open	category	attr_key	attr_value
0	45.471070	-122.648270	5.0	23	0	Coffee & Tea	restaurantspricerange2	1
1	45.471070	-122.648270	5.0	23	0	Coffee & Tea	bikeparking	True
2	45.471070	-122.648270	5.0	23	0	Coffee & Tea	outdoorseating	True
3	49.194168	-123.069725	4.5	11	0	Coffee & Tea	restaurantspricerange2	2
4	49.194168	-123.069725	4.5	11	0	Coffee & Tea	outdoorseating	True
...	...	...	...	...	...	...	...	...
30525	42.249004	-71.002450	4.0	63	0	Coffee & Tea	bikeparking	False
30526	42.249004	-71.002450	4.0	63	0	Coffee & Tea	outdoorseating	False
30527	40.022823	-83.014140	4.0	276	0	Coffee & Tea	restaurantspricerange2	2

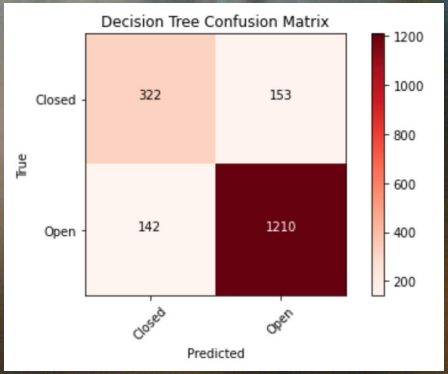
	latitude	longitude	stars	review_count	is_open	category	price	bikeparking	outdoorseating	is_chain	age_in_days	monthly_reviews	tips_count
0	45.471070	-122.64827	5.0	23	0	Coffee & Tea	1	1	1	0	534.475509	2.0000	0
7	28.664944	-81.42231	2.5	37	1	Cafes	1	1	1	1	2450.284086	1.3448	1218
11	28.664944	-81.42231	2.5	37	1	Coffee & Tea	1	1	1	1	2450.284086	1.3448	1218
15	28.664944	-81.42231	2.5	37	1	Donuts	1	1	1	1	2450.284086	1.3448	1218
19	40.004190	-83.00835	4.0	16	1	Coffee & Tea	1	0	1	1	1842.424491	1.2308	260
...	...	...	...	...	...	...	...	...	...	...	...	...	...
30511	49.263325	-123.09958	4.5	148	0	Bakeries	2	1	0	0	3151.121030	2.5000	6076
30514	42.165356	-71.16374	2.5	21	1	Coffee & Tea	1	0	0	1	4906.756690	1.0952	315

Predict Coffee Shop Successfulness

Fit Classifier Models to new Features

- Decision Tree Classifier
- Random Forest Classifier



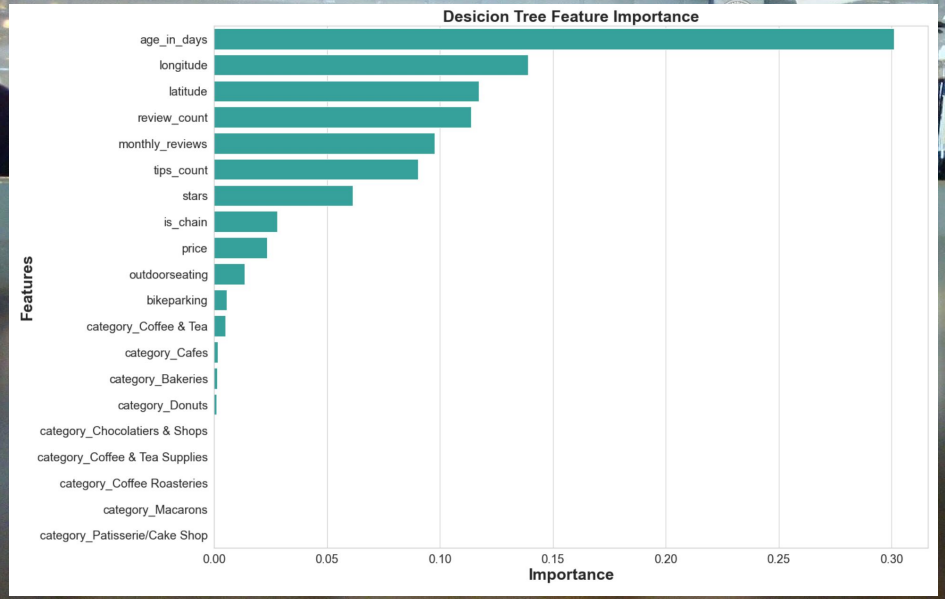


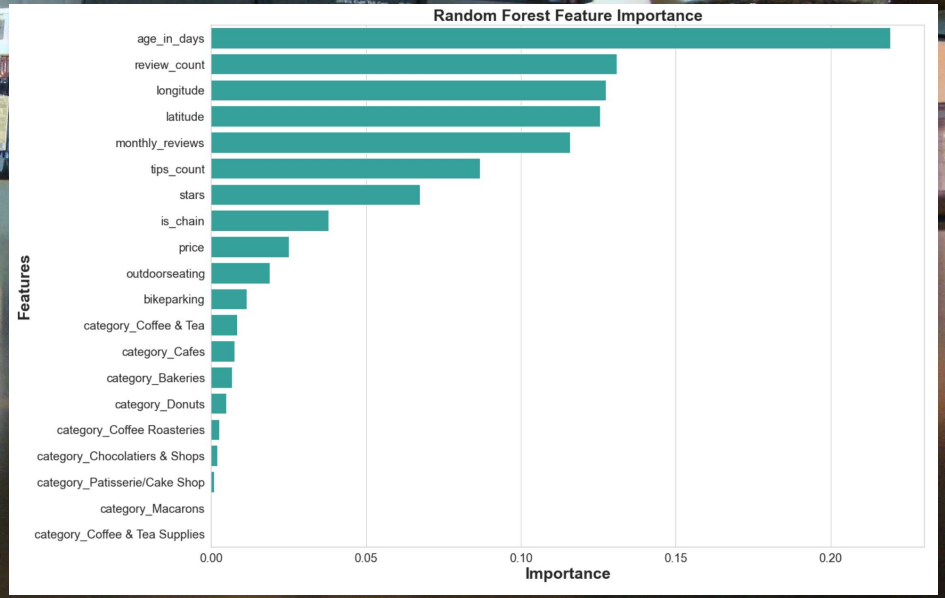

```
Testing Score: 0.8385331143951834
Confusion Matrix:
 [[ 322  153]
 [ 142 1210]]

Testing Score: 0.8522167487684729
Confusion Matrix:
 [[ 243  232]
 [  38 1314]]
```

Predict Coffee Shop Successfulness

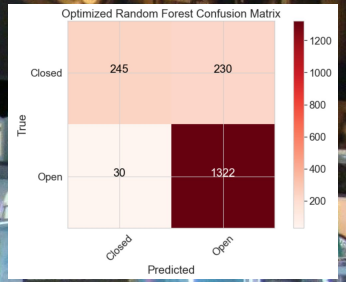
Define Feature Importances

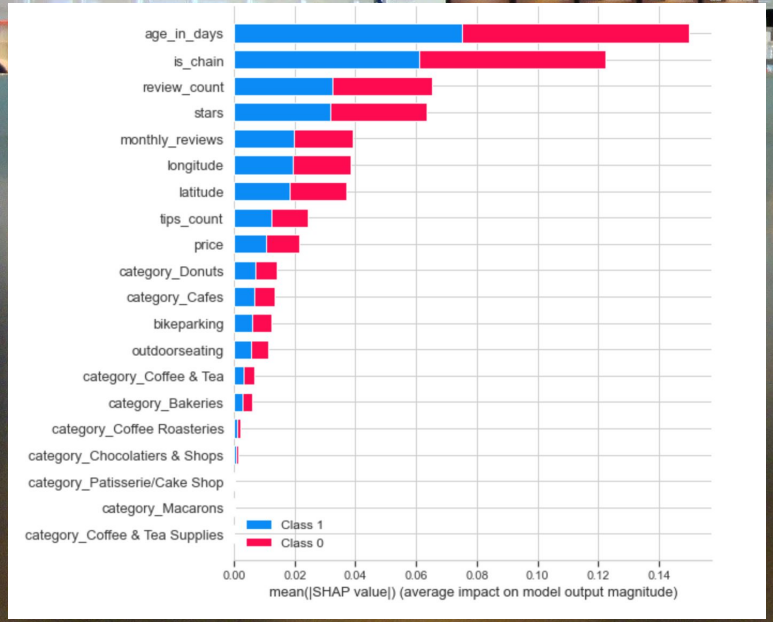


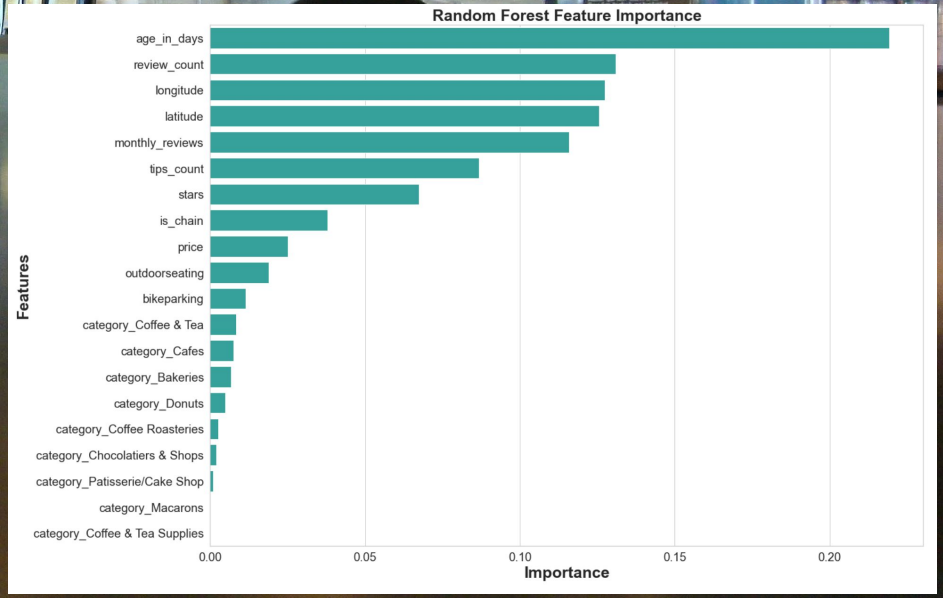


Predict Coffee Shop Successfulness

Random Forest Classifier was selected and optimized

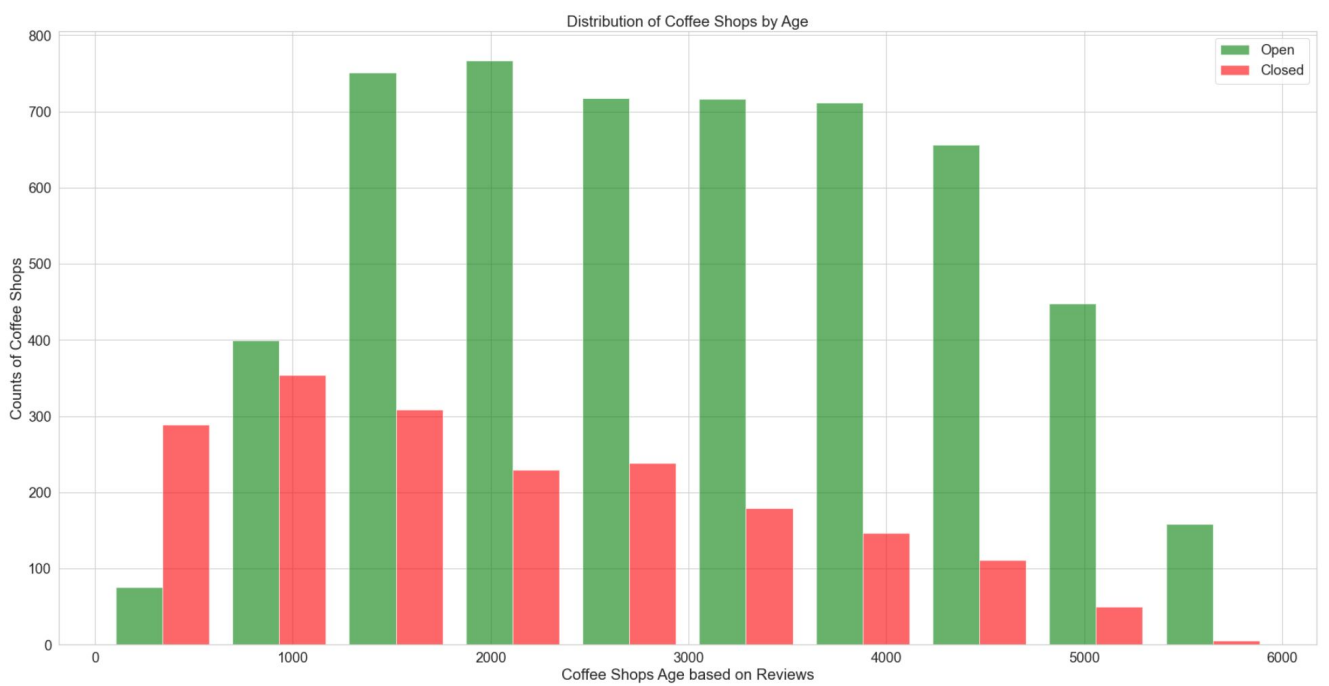






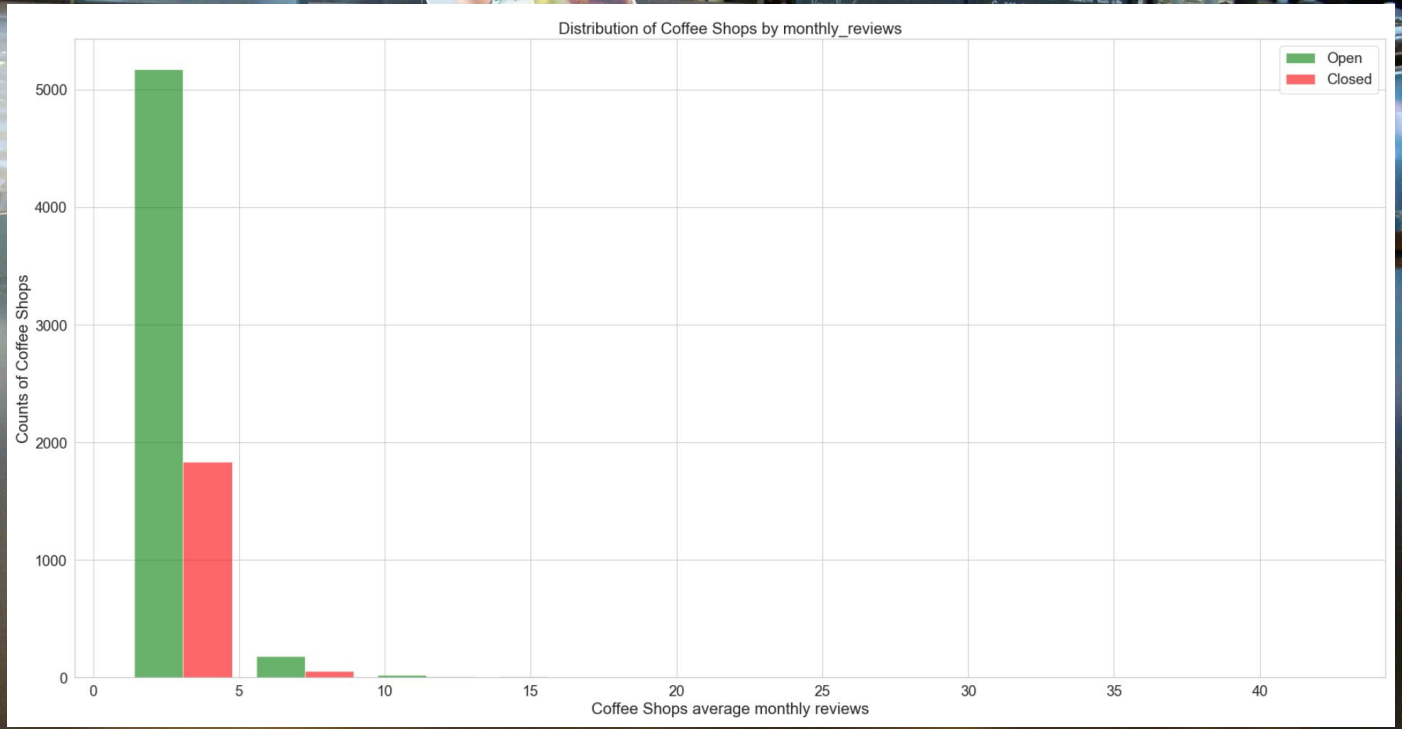
Predict Coffee Shop Successfulness

Feature Impacts Analysis



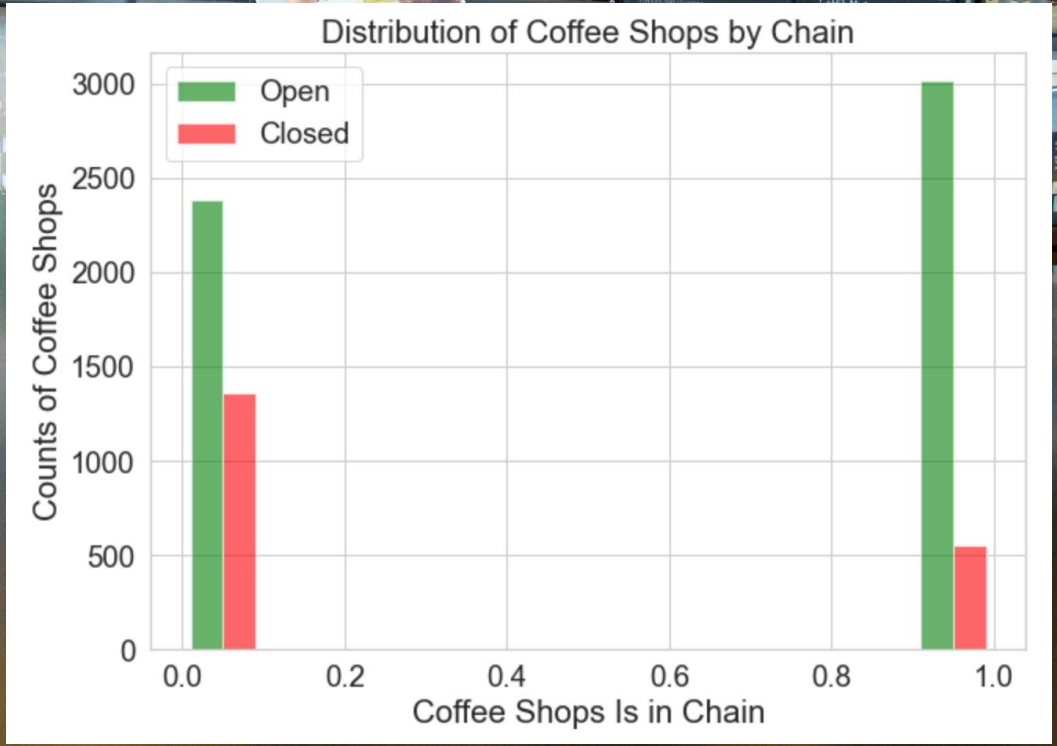
Predict Coffee Shop Successfulness

Feature Impacts Analysis

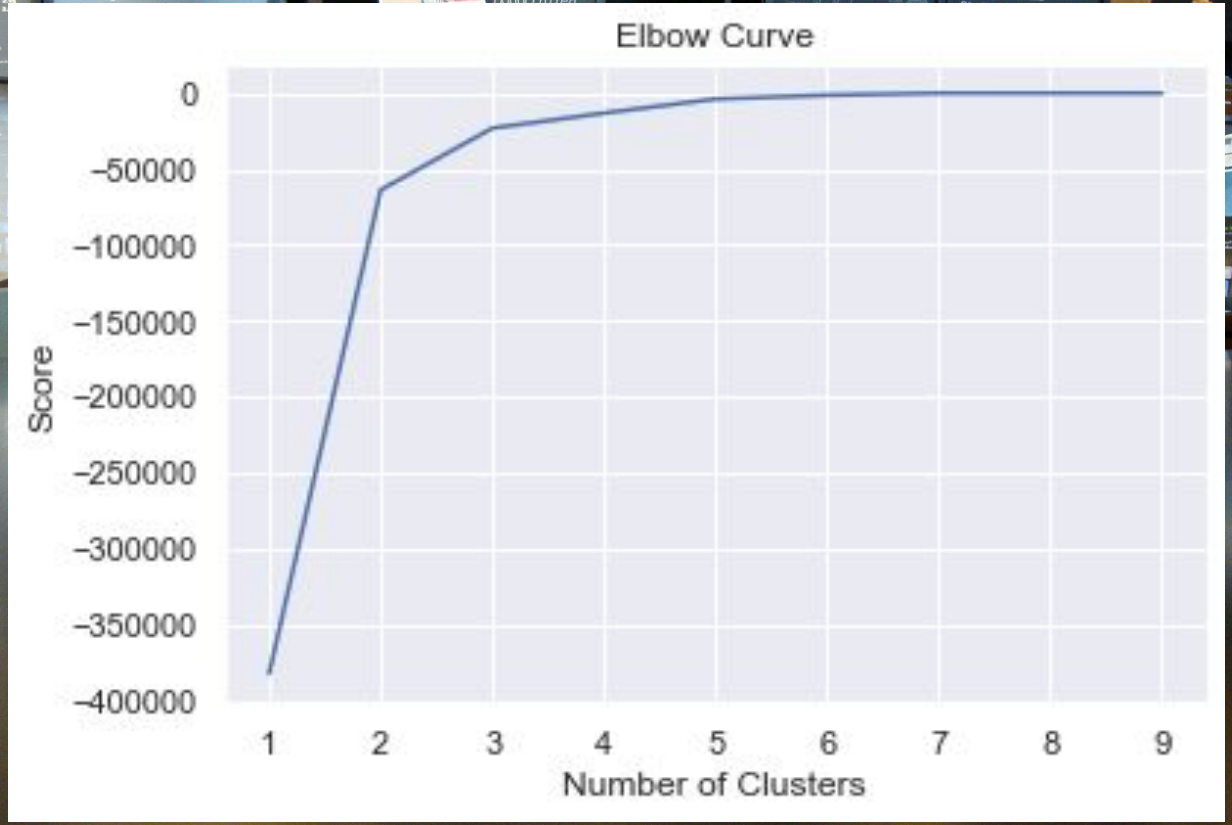


Predict Coffee Shop Successfulness

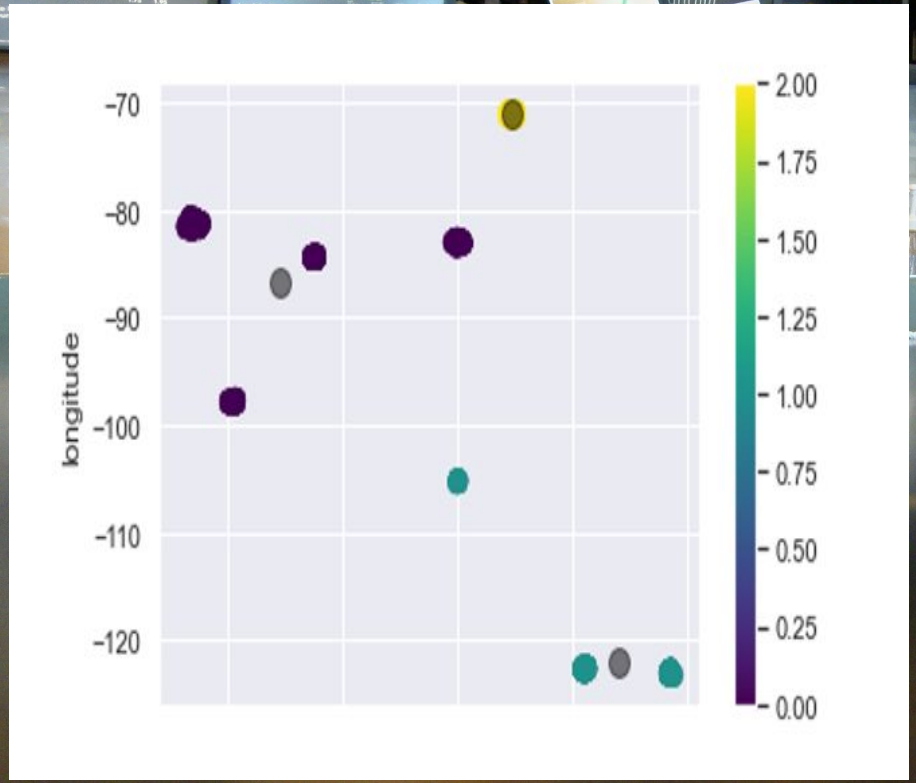
Feature Impacts Analysis



Coffee Shop Clustering using Elbow Curve Method



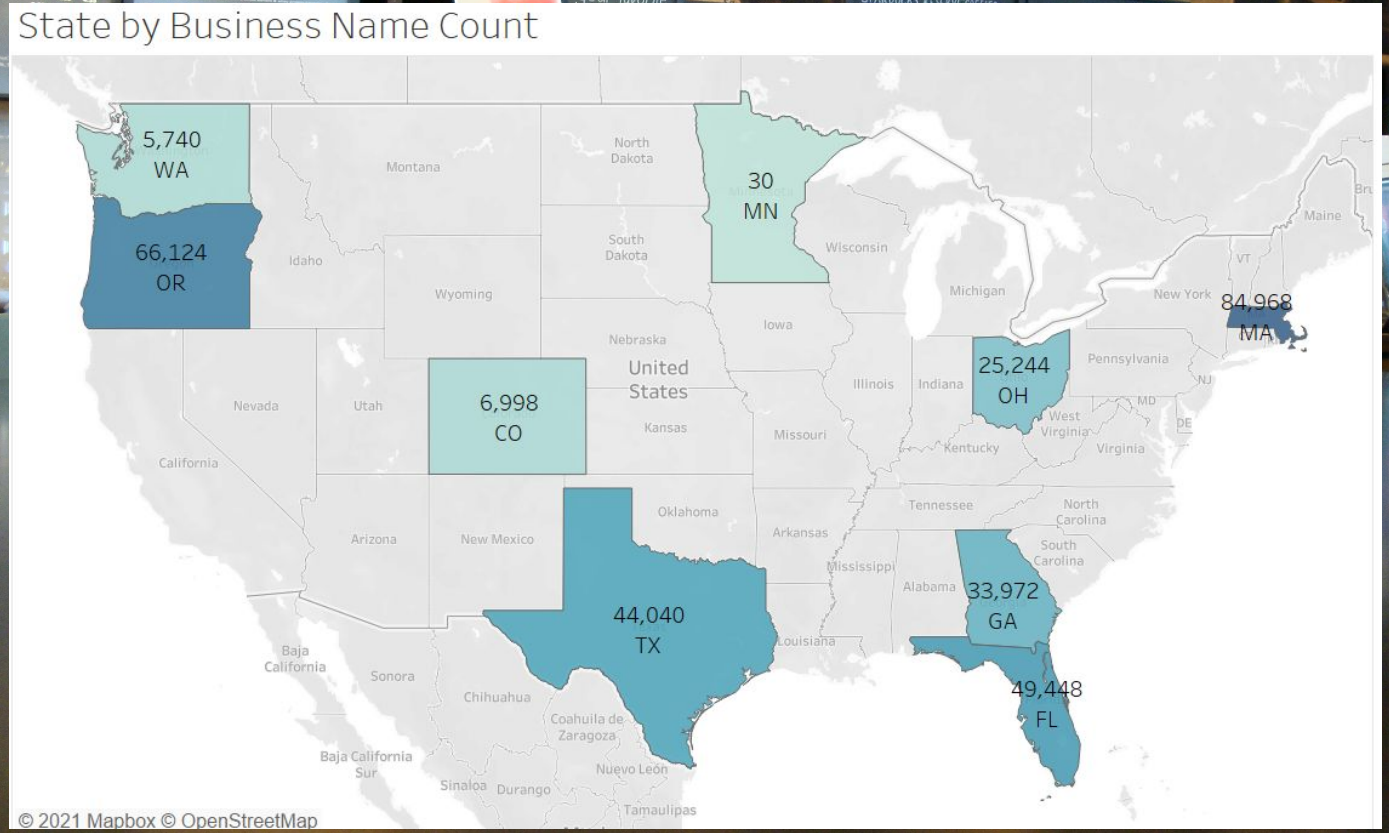
Coffee Shop Cluster Visualization



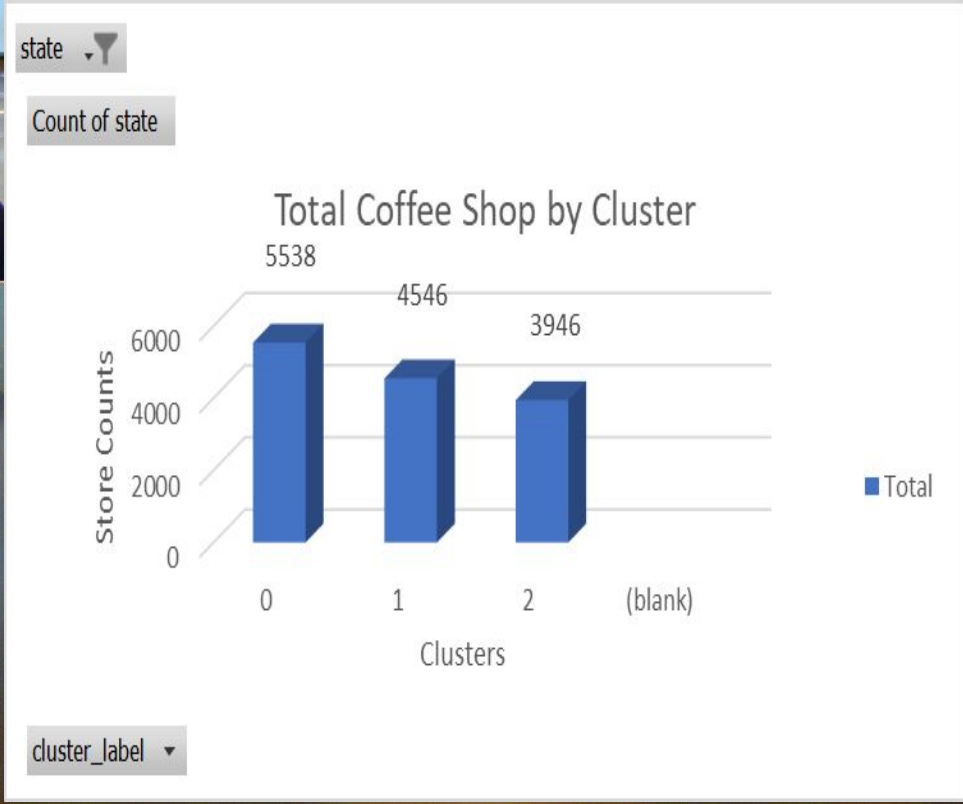
Three clusters were used as optimal number of clusters with center of clusters:

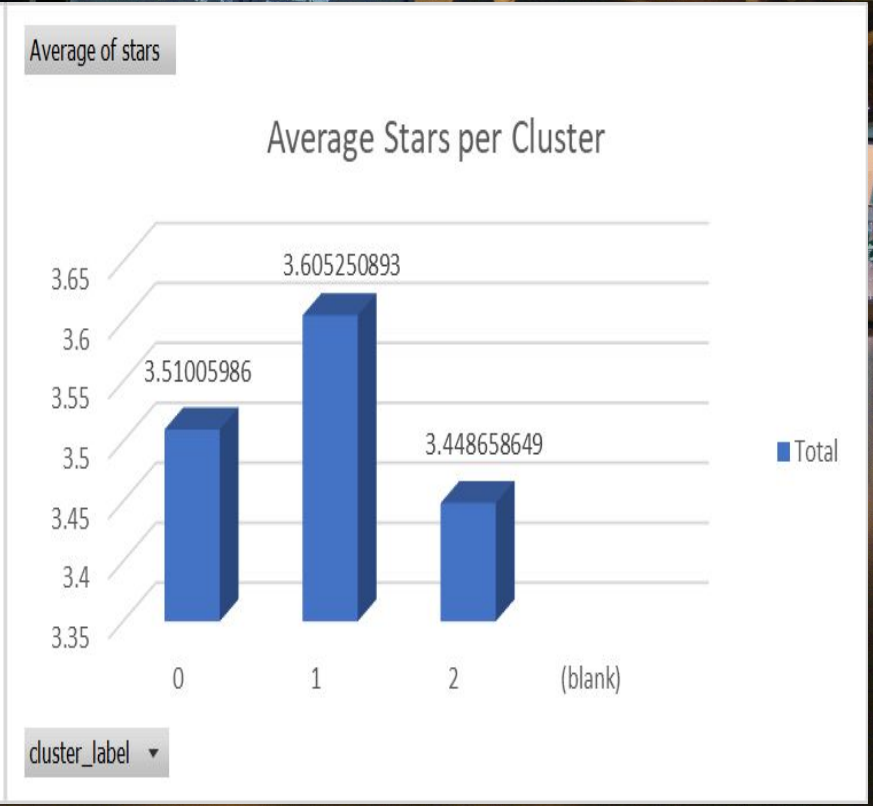
(47.01608364, -122.04168551)
(42.36606526, -71.09138863)
(32.26496969, -86.68173042)

Coffee Shop Cluster Visualization



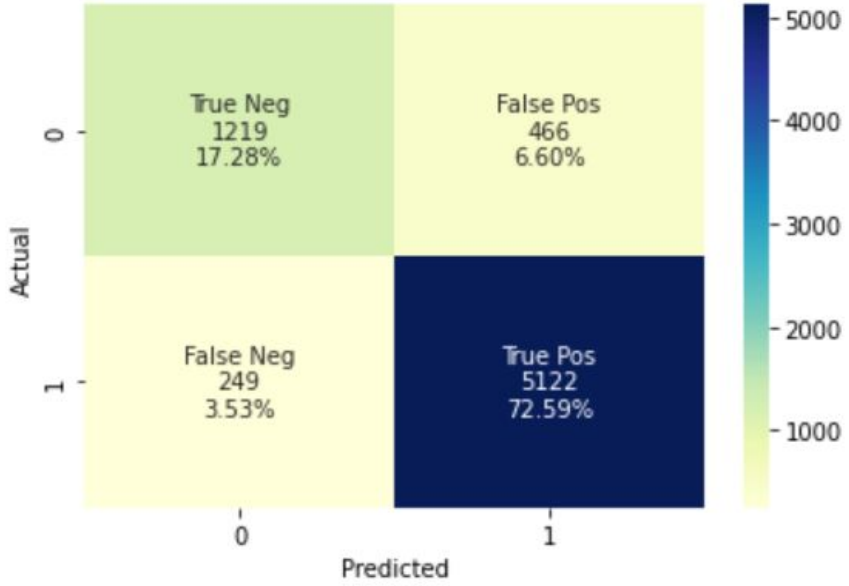
Coffee Shop Cluster Visualization





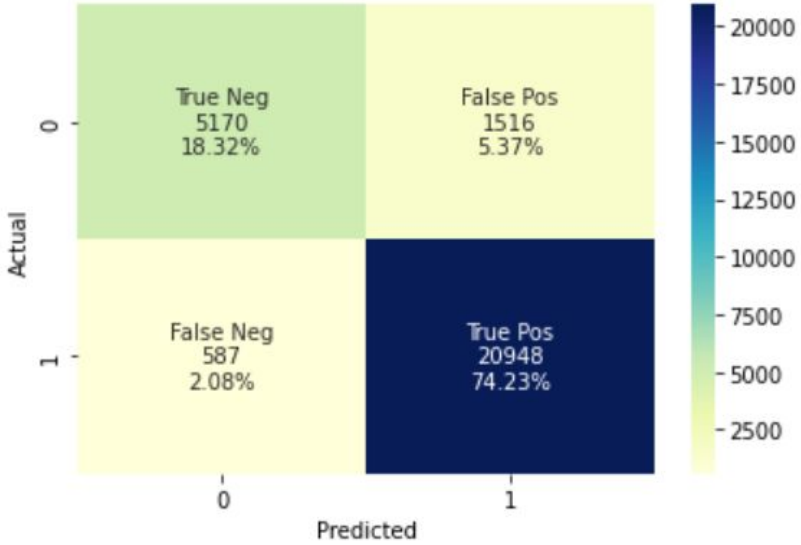
Naive Bayes Model

```
[[1219  466]
 [ 249 5122]]
```



CM Test Data

```
[[ 5170  1516]
 [  587 20948]]
```



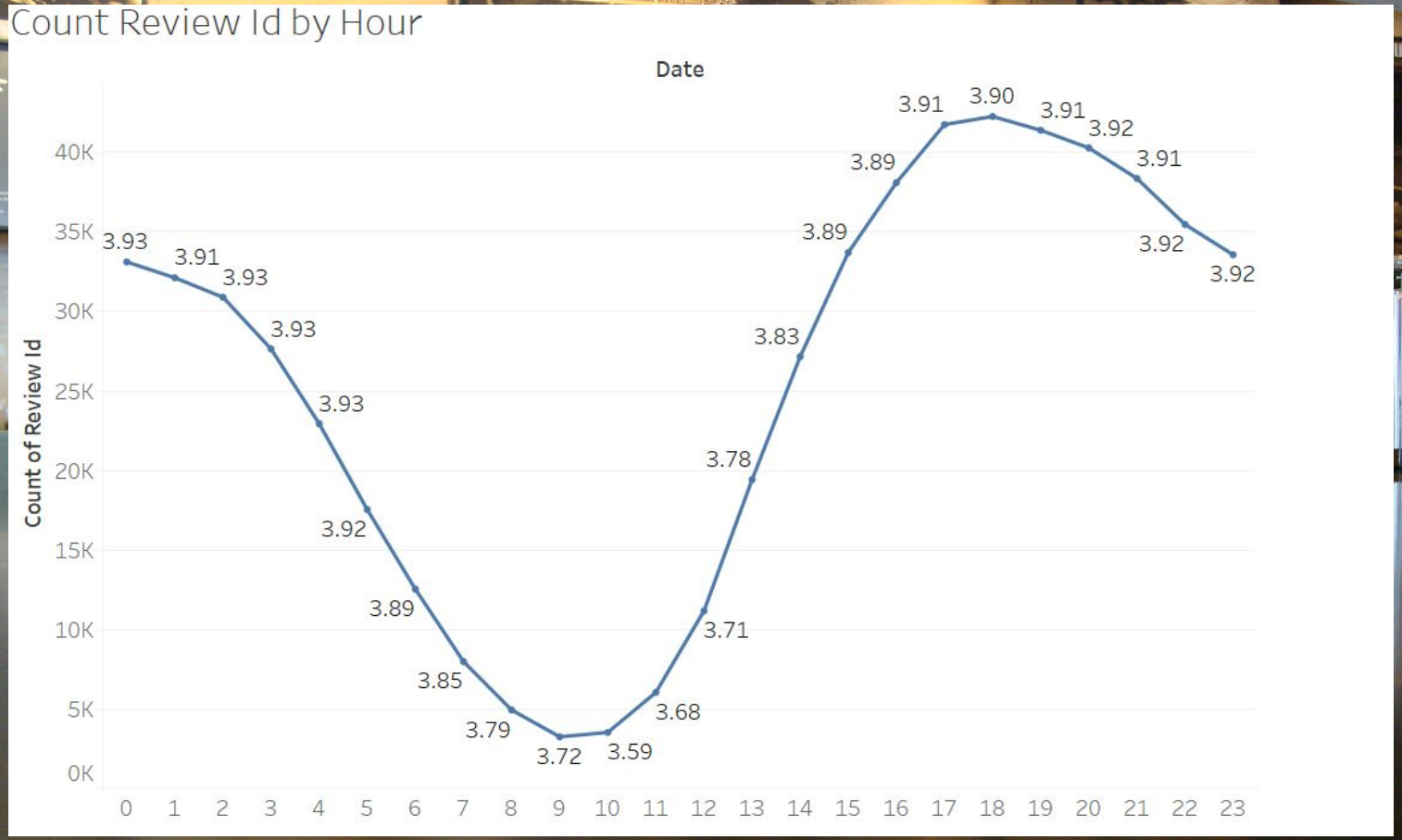
CM Train Data

Naives Bayes Classification

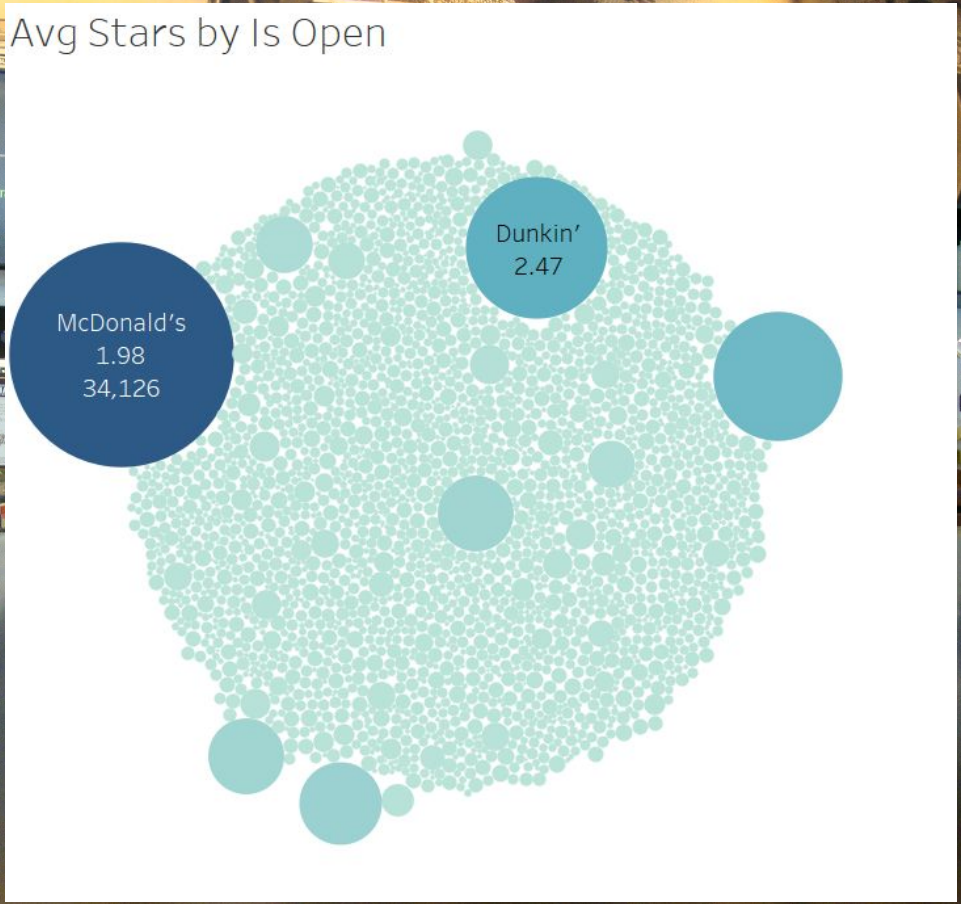
	precision	recall	f1-score	support
0	0.83	0.72	0.77	1685
1	0.92	0.95	0.93	5371
accuracy			0.90	7056
macro avg	0.87	0.84	0.85	7056
weighted avg	0.90	0.90	0.90	7056

Unsatisfied Customers : 0

Satisfied Customers : 1



Visuals from Tableau



Visuals from Tableau

Espresso
Iced Espresso
Smoothies
Iced Coffee & Tazo Tea
Go with your favorite handcrafted ahhhh
STARBUCKS RESERVE COFFEES
CLASSIC BREWED
Sold Out
Treat Receipt

Questions?