Food cons

RESTAURANT SENTIMENT ANALYSIS -

IN DEPTH OF CLASSIFICATION ALGORITHMS

PRESENTED BY ANGGITA P. L

Data Science Batch 21

Start Slide

Food cons

About Me

Bring a Ideas
To Life

Presentations are meant to inform my portofolio which bring a new idea/product.

GITHUB

GITA-2112 / BOOTCAMP PROJECT

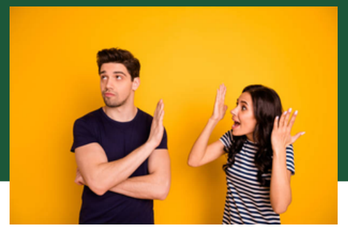
LinkedIn

anggitaputri-gita

Background Story

“Each plate tell a story and every bite an experience.”

33%



Based on TripAdvisor, Google, or Yelp. In fact, rankings on review sites matter so much that 33% of customers won’t eat in restaurants with an online rating lower than 4 stars.

Glowing reviews and high ratings are helping restaurant owner and management build brand trust, but at the same time, customer feedback is crucial for improving their service and stepping up the game.

Food Cons

Target Audience

Business Owner & Management

As business owner & management team, perspective ratings and reviews have a significant impact on their operations and reputation. Customer Trust, Credibility & Risk Mitigation

Investor

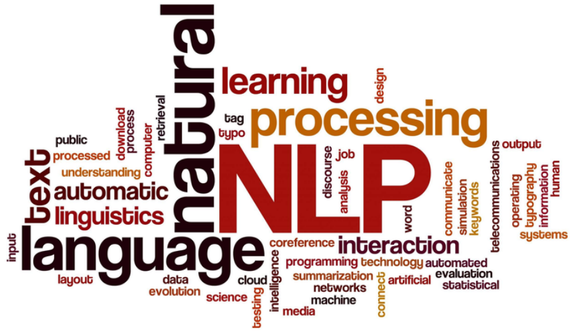
Investors recognize that a company's brand and reputation are valuable assets. Positive reviews and a strong online presence which can impact a positive growth.

Competitor

As competitor, ratings and reviews of a rival company's products or services can offer valuable insights and strategic advantages

Problem Statement

These day, we had a thousand or a million a reviews from any platform. Besides, the review sometimes abstract or full with emoticon and inconsistency.



By leveraging NLP, we are able to segment words, images, and videos, enabling them to be processed by machines for classification and prediction, with the ultimate goal of deriving valuable insights.

The Result

Segmentation results allow us to extract valuable insights.

Benefit Of The Project

NLP and machine learning predictions enables us to generate summaries that serve as insights to our target audience. Business owners and management can place a stronger emphasis on negative sentiment analysis to mitigate risks and formulate strategic responses, while investors can focus on growth potential.

90%

Customer Satisfaction Index

5-Star

Popularity Index Ranking

Objective

The Goal is to identify and understand the growth potential for restaurants by analyzing customer reviews. Helping restaurants improve their services, make informed decisions, and potentially increase in their business.

DATASET OVERVIEW

SOURCE : HTTPS://GITHUB.COM/MANTHANPATEL98/RESTAURANT-REVIEW-SENTIMENT-ANALYSIS/TREE/MASTER

DATASET

	Restaurant	Reviewer	Review	Restaurant Rating	Metadata	Time	Pictures
9545	Desi Bytes	Prateek Kumar	FOOD WAS TASTY...QUANTITY OF CHOKHA WAS SUFFIC...	4	1 Review	7/8/2018 10:53	0
3651	Banana Leaf Multicuisine Restaurant	S. Chandransh	Good quality, tasty food. Good variety in reas...	5	19 Reviews , 4 Followers	8/29/2018 17:39	0
5766	Being Hungry	Prite	good	5	5 Reviews , 1 Follower	7/28/2018 0:51	0
4682	Ulavacharu	Veeru	Extremely disappointed with the food taste.we ...	2	1 Review , 1 Follower	11/5/2018 9:11	0
3047	Pot Pourri	Shashi Prakash	Pot Pourri does maintain good food hiegene. I ...	4	2 Reviews	3/7/2019 20:50	0
432	Over The Moon Brew Company	Rajiv Singh	Nice place. Went out here twice with my friend...	4	7 Reviews , 2 Followers	5/15/2019 19:10	0
7067	Urban Asia - Kitchen & Bar	Pradeep Yadlapati	Great food. The spread was really nice. Has go...	5	1 Review , 11 Followers	10/19/2018 20:45	0
9621	Hyderabadi Daawat	BeingHydFoodie	Follow My Instagram @BeingHydFoodie\n\nHyderab...	5	137 Reviews , 1563 Followers	3/17/2019 13:06	32
1696	NorFest - The Dhaba	Arushi Jain	One of the best place to have punjabi food. We...	4	13 Reviews , 6 Followers	5/31/2018 22:08	0
89	Beyond Flavours	Trupti Dhongdi	Had a very bad experience here\nbeyond flavour...	1	12 Reviews , 5 Followers	5/8/2019 14:35	0

Original Dataset

Datashape : 10000 , 7 columns

Data Info

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 9964 entries, 0 to 9999
Data columns (total 10 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   Restaurant         9964 non-null   object
 1   Reviewer           9964 non-null   object
 2   Review             9964 non-null   object
 3   Restaurant Rating  9964 non-null   float64
 4   Metadata           9964 non-null   object
 5   Time               9964 non-null   datetime64[ns]
 6   Pictures           9964 non-null   int64
 7   Date               9964 non-null   object
 8   Year               9964 non-null   int64
 9   Timestamp          9964 non-null   object
dtypes: datetime64[ns](1), float64(1), int64(2), object(6)
memory usage: 856.3+ KB
```

Dataset Cleaning

Datashape : 9964 , 9 columns

EDA

Word Cloud Review - Before Classified to Sentiment Positive & Negative

one
food
place
good
service
taste
ordered
restaurant
ambience
chicken
time
nice
best
starter
order
staff
friend
biryani
great
amazing
really
must try
ice cream
dessert
main course
go
loved
price
lot
much
average
spicy
menu
quantity
Overall
tasty
visit
give
quality
quite
bad
variety
need
awesome
item
rice
even
experience
drink
dishe
served
well
Thank
make
love
will
went
pizza
tried
decent
worth
better
perfect
table
good place
Zomato
fresh
lunch
pasta
visiting
delicious
Hyderabad
money
delivery
hangout
option
recommend
sweet
serve
worst
people
liked
definitely
disappointed
ambiance
though
music
took
look
feel
full
special
offer
dish
soup
burger
little
dinner
good service
waiter
guy
paneer
tasted
keep
excellent
coming
flavour
always
around
buffet
noodle
made
asked
enjoy
family
friendly
veg
pasta
know
way
many
available
non veg
want
came
different
mug
cake
rice
take
ok
something
especially
customer
rating
review
small
day
less
good
really
first
kind
veg
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disappointed
ambiance
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look
fresh
Zomato
table
eat
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cake
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different
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perfect
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enjoy
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know
veg
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pasta
good
really
need
bad
variety
quite
quality
visiting
lunch
music
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fresh
Zomato
table
good place
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item
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kind
veg
non veg
disappointed
ambiance
though

EDA

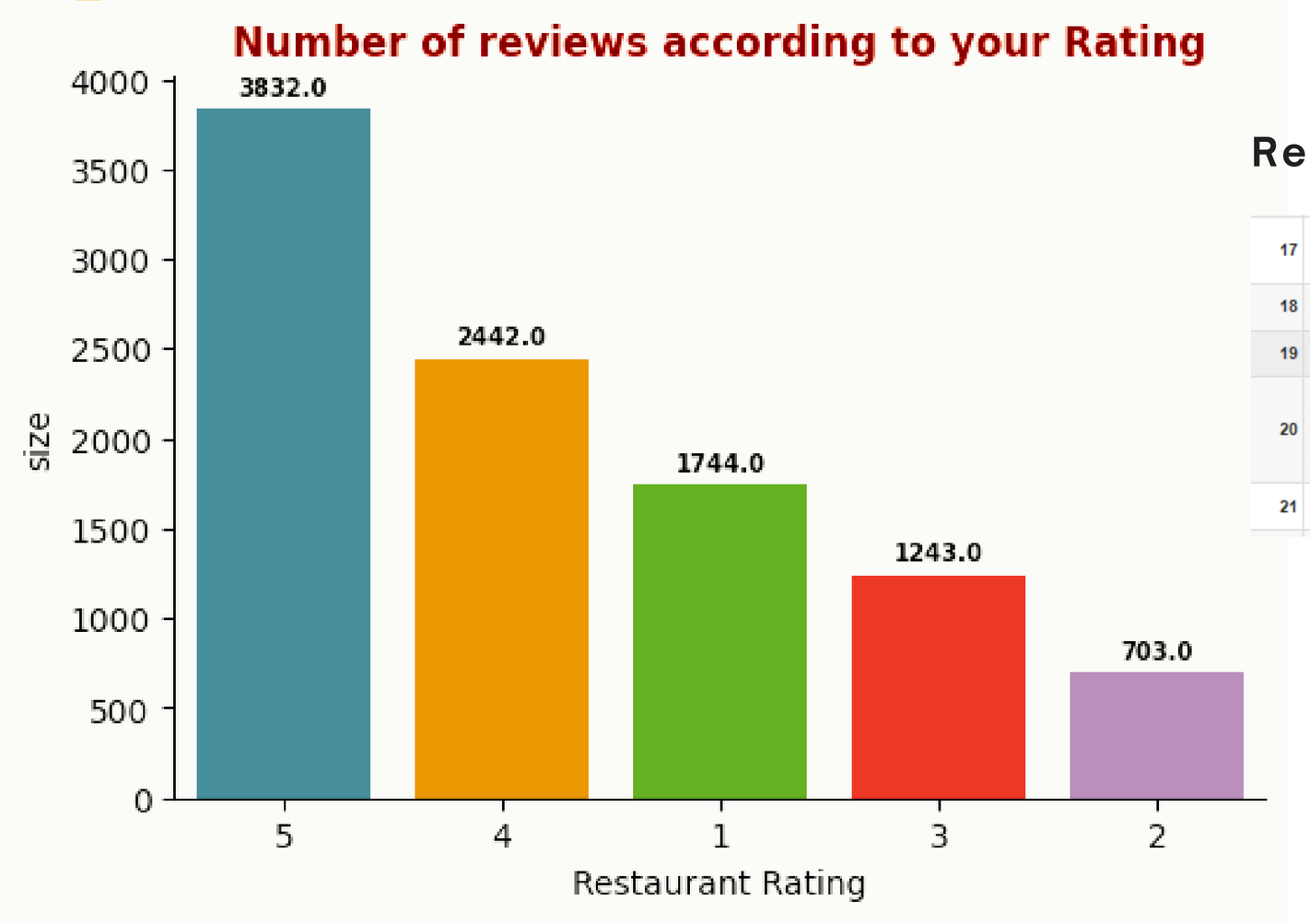
Word Cloud Review - After Classified to Sentiment Positive & Negative

Sentiment Positive

Sentiment Negative

EDA

Rating Classification

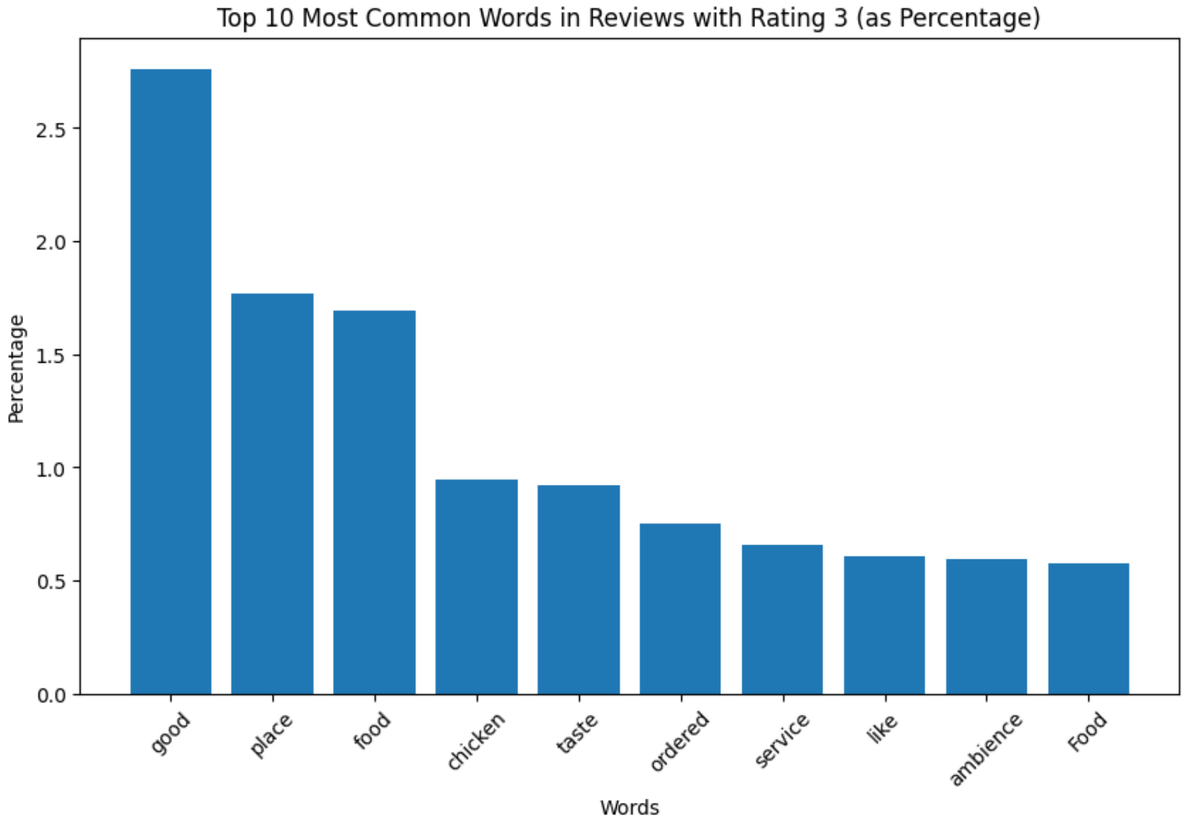


Review Classification by Rating

17	The best thing about this place is the food. My favorite go to dish here is definitely Alfredo Pasta although other items are good as well. And the service and behavior of the staff is top-notch. We we're attended by Mr. Soumen Das and he was extremely polite. Will definitely visit soon.
18	Polite and friendly staff. Nice ambience and good spread of menu. Drinks are awesome. Service is very good by manav... looking forward to seeing it again...
19	Food is really good. We had vegetarian items including paneer, mushroom and kofta. Additionally service from Papiya , Shuvro was really good.
20	Beautiful, cozy and classy at the same time, this place is truly recommended for your special days. With 15 percent corporate discounts, you can treat your cotorie well without burning a hole ur pocket. Also, the interior is done so well, you ll love the vibe. On the menu, honey chilli lotus stems, basket biryanis, sizzling brownies were my favourite. Also loved the tomato basil shorba, different from the creamy standards in other restaurants. I'm definitely making more visits to Beyond Flavours. Special mention to Papiya, our hostess for the evening, excellent service :)
21	please was good but it was quite expensive and coming to taste we can rate 3 out of 5, we cant click better pictures wen we visit in night🤒😊best in day time for pics

EDA

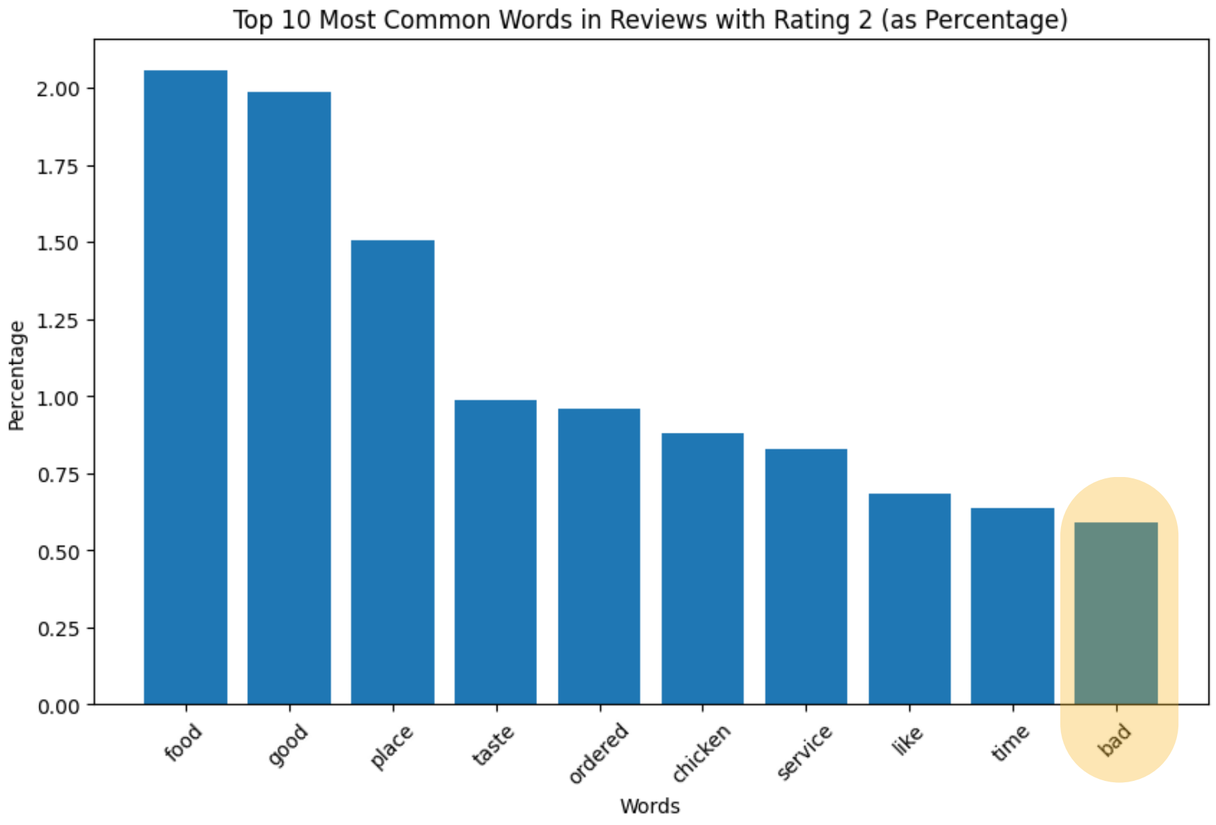
Rating #3 is that sentiment Neutral ?



Seems like Positive Sentiment

EDA

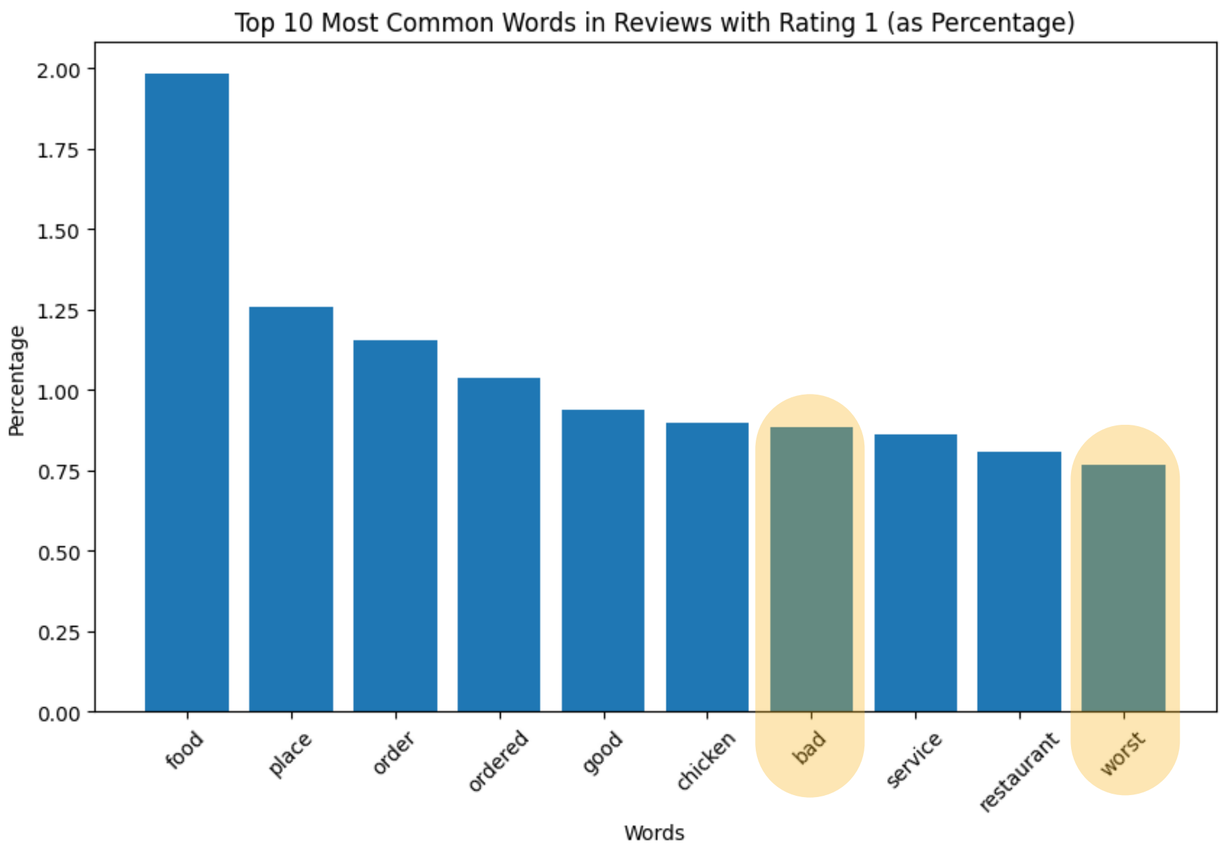
Rating #2 is that Sentiment Negative



ordered
good
ambience
time
service
taste
food
place
chicken
restaurant
average
bad
order
even
one
starter
staff
quality
biryani
great
served
disappointed
experience
better
went
rice
table
will
tasted
much
spicy
lot
waiter
drink
quantity
menu
got
lunch
customer
noodle
main course
item
pathetic
buffet
tasty
decent
people
eat
price
worth
visited
ok
dinner
paneer
first
ambiance
though
pizza
water
say
really
nothing
u
veg
thing
try
took
asked
review
sauce
money
visit
rating
fish
given
nice
cold
chocolate
sweet
worst
Overall
way
take
well
please
look
okay
hard
dishes
give
need
mark
friend
small
recommend
expected
visited
star
feel
dry
two
gave
tried
day
many
slow
dining
review
sauce
dessert
chicken
rice
lunch
tasty
worth
drink
cold
waiter
veg
thing
try
served
great
disappointed
experience
better
went
worst
menu
quality
time
ambience
ordered
food
place
restaurant
chicken
service
taste
good
average
bad
order
staff
starter
biryani
spicy
lot
people
eat
price
sweet
decent

EDA

Rating #1 is that Sentiment Negative



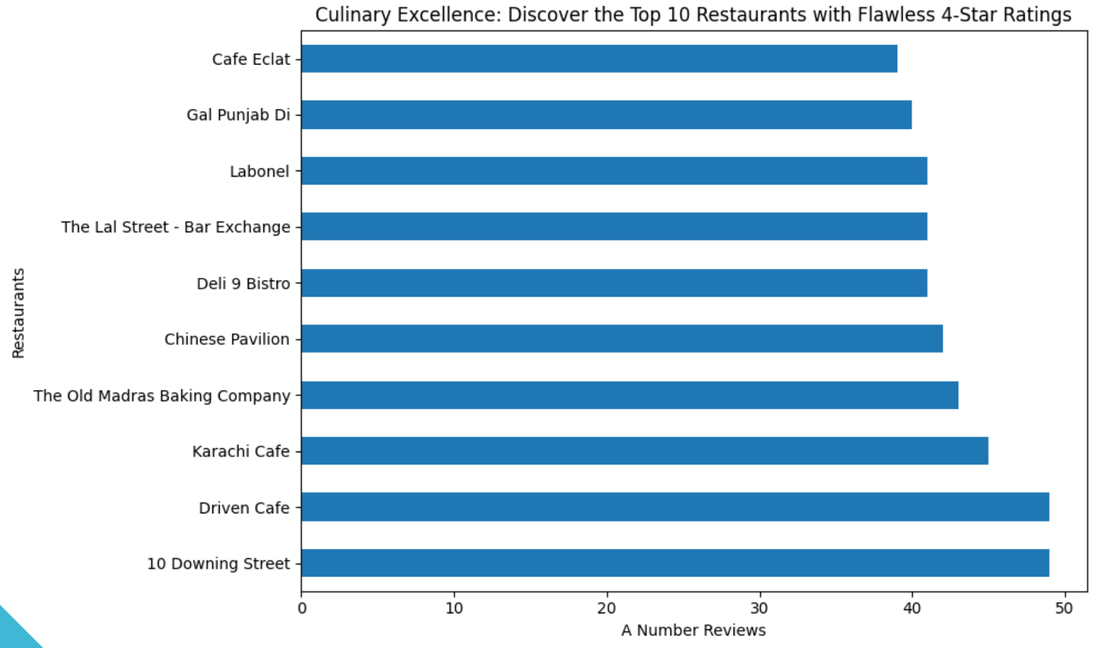
There are a negative words

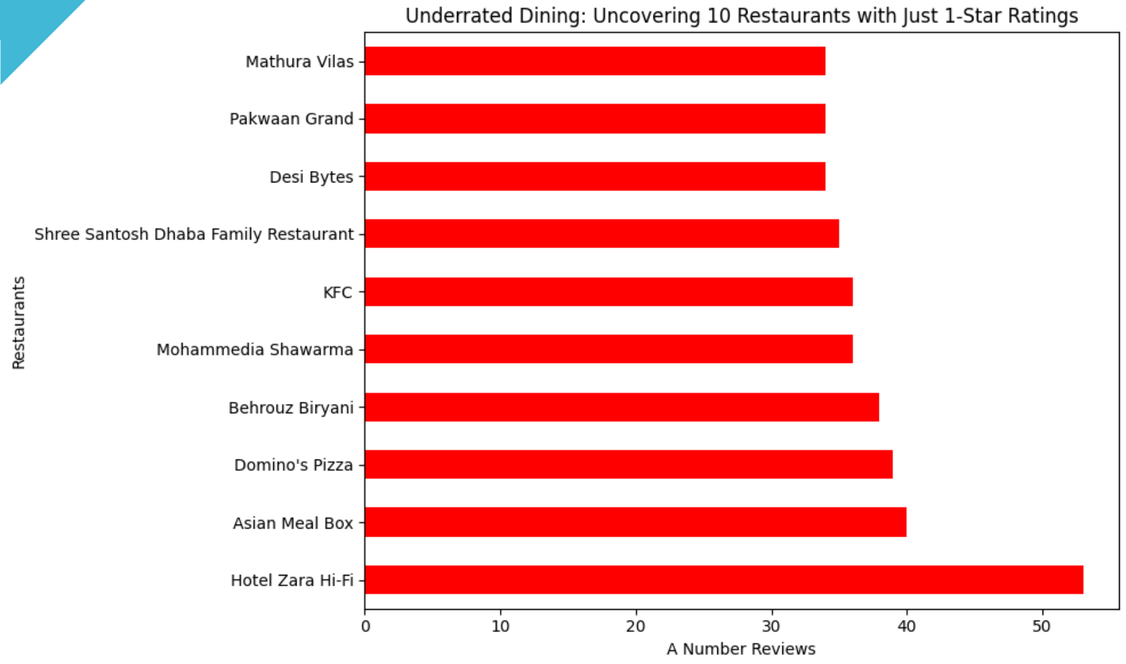
POPULARITY RANKING INDEX

popularity ranking index consider the number of likes, comments, and followers to determine how popular a restaurant. In the context of websites, it could consider the number of page views, reviews, rating and time spent on the site.

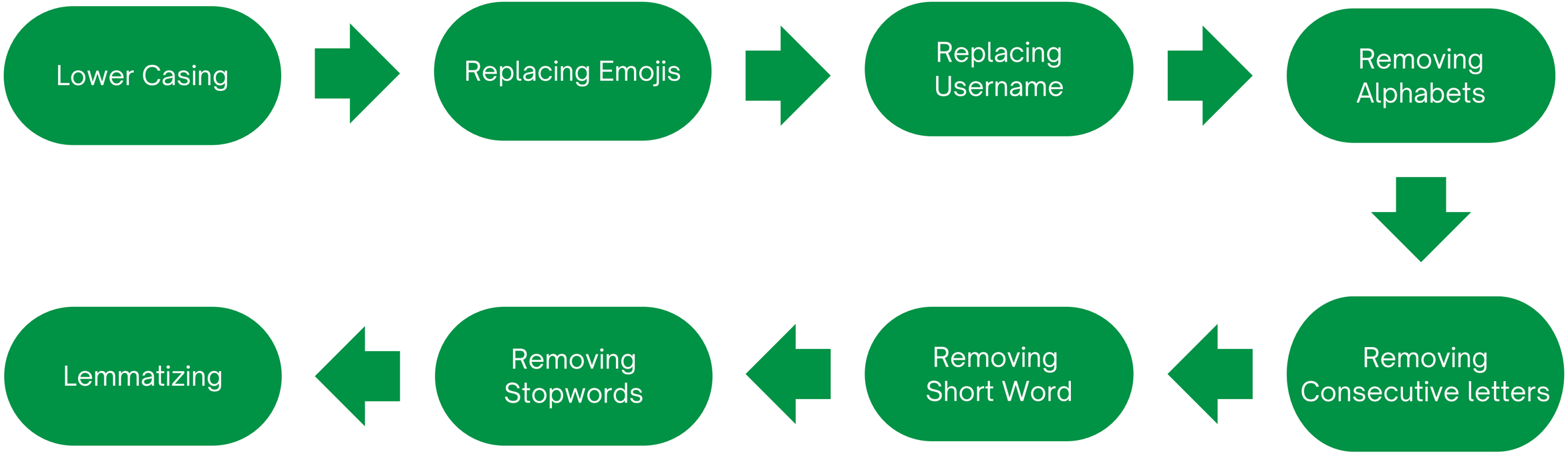
2

	Reviewer	Metadata	size
	Parijat Ray	146 Reviews , 333 Followers	13
	Jay Mehta	46 Reviews , 43 Followers	11
	Vedant Killa	86 Reviews , 216 Followers	11
3	Siva Kumar	84 Reviews , 183 Followers	10
4	Age Of Foodies (Suraj Karambe)	104 Reviews , 334 Followers	10
5	Manojkumar D Nambisan	29 Reviews , 11 Followers	10
6	Anusha Sinha	42 Reviews , 49 Followers	9
7	Prachita Jayaswal	104 Reviews , 531 Followers	9
8	Prasun Gokhlani	25 Reviews , 5 Followers	9
9	Nillu	17 Reviews , 9 Followers	9
10	Khushboo Pandey	59 Reviews , 42 Followers	9





DATA PRE-PROCESSING



RESULT
PRE-PROCESSING

Sentiment Positive

Sentiment Negative

index	text	label
0	The ambience was good, food was quite good . had Saturday lunch , which was cost effective . Good place for a sate brunch. One can also chill with friends and or parents. Waiter Soumen Das was really courteous and helpful.	Positive
1	Ambience is too good for a pleasant evening. Service is very prompt. Food is good. Over all a good experience. Soumen Das - kudos to the service	Positive
2	A must try.. great food great ambience. Thnx for the service by Pradeep and Subroto. My personal recommendation is Penne Alfredo Pasta:) ..... Also the music in the background is amazing.	Positive
3	Soumen das and Arun was a great guy. Only because of their behavior and sincerety, And good food off course, I would like to visit this place again.	Positive
4	Food is good.we ordered Kodi drumsticks and basket mutton biryani. All are good. Thanks to Pradeep. He served well. We enjoyed here. Ambience is also very good.	Positive
5	Ambiance is good, service is good, food is aPradeecp and subro best service Food is good. Papiya good hostess and ur caption very good. This is 4star restaurant.	Positive
6	Its a very nice place, ambience is different, all the food we ordered was very tasty, service is also gud, worth visit. Its reasonable as well. Really a must visit place.	Positive
7	Well after reading so many reviews finally visited this place...ambience was so good and coming to food crispy corn is nice. Tawa fish was ok... Basket Biryani disappointed us... biryani was ok but not flattering as they claimed.. Staff was polite and prompt especially pradeep and Suman.	Positive
8	Excellent food , specially if you like spicy food . Courteous staff . Shubro and pradeep and papiya gave excellent service to our corporate team dinner . Overall great for team dinners and party	Positive
9	Came for the birthday treat of a close friend. Perfect place for a treat like this. Very hospitable and cooperative staff. Food was delicious, ambience was really good with the music and the lighting. Chili honey lotus stem is a must try here. Special mention to Papiya who took good care of us.	Positive
10	The service was great and the food was awesome. The service staff Manab and Papiya were very courteous and attentive. I would like to come frequently to this place	Positive

index	text	label
14	We ordered corn cheese balls, manchow soup and paneer shashlik sizzler. The sizzler was stale. Paneer was smelling and the waiter was so impolite to even accept the mistake. Never going again	Negative
66	we went for a team lunch, such a worst restaurant.. food was tasteless, service was very slow and Ac was not working. We've requested them multiple times but its of no use. Please don't waste your money and I strictly recommend not to prefer beyond flavours,	Negative
75	I have been at this place for dinner a few days back. The ambience was good. The restaurant was almost half occupied. We immediately got a table. But then waited for 10 mins to get water and menu, that too after a few reminders. We ordered a few starters, main course items and mock drinks. Only the starters could be served in 30 mins. There was no sign of mock drinks! We noticed similar service issues on other tables. Noticed guests literally shouting on the staff. The food was just average. Dishes were not prepared well, at least when compared to 4.1 rating on Zomato. We finally decided to just have starters, and hop onto another restaurant for rest of the meal!	Negative
79	I would like to introduce this restaurant to a new ingredient called salt. If you add that yo your food, it would taste way better. So basically none of the food we ordered had salt. We ordered Fries, panko mozzarella sticks, Tomato cream soup, panner65 & "Italian" Nachos. Not sure how that was nachos or italian. They basically bought a pack of dorittos and added mozarella cheese on top. The beans were not baked at all, and the entire dish was cold except for the plate that it was brought in. Pretty sure they just dumped the items and stashed it inside a microwave. The paneer 65 was horrendous. Might as well called it garlic 65 with no salt. Next was the mozarella sticks, which was again cold and no salt. The only decent item that we got was the fries and the soup. Thanks to gid we didnt order any main course. All these came up to 1300 and odd. Thanks to Zomato Gold, our price went down. This place is way too expensive for the quality of food they serve. And talking about the restaurant in general, the place looks decent but there are stoves stashed under tables and seats and plants kept at inconvenient spots. They really need to clean up more.	Negative
80	Hostile staff, okeish food, not so great ambiance. Not sure how the rating on zomato stands at 4.1 Starters we're decent but main course was horrible. Will not suggest this place.	Negative
83	Food quality and taste is not good. Super slow service. Nice ambience but very poor in customer handling. Lot of items not available even if in the menu.	Negative
84	This was my worst experience at a restaurant ever. First our starters were served after half an hour of ordering and the chicken popcorn had a hair strand in it yuck! Then the guy who took our main course order forgot about it completely so we had to order again after waiting for almost an hour. Then had to wait for another half hour to get our food. And the worst of all, they got us chicken lasagna instead of veg lasagna. We figured out that it was chicken right before one of my staunch vegetarian friend almost ate it. I do not recommend this place at all. There are so many better places in Gachibowli that could save your time and provide better service.	Negative
89	Had a very bad experience here beyond flavours really puts you beyond all the flavours had gone here for dinner and the next day had to get hospitalised because of food infection I guess the food was not served fresh	Negative
91	I liked the food and ambience but the problem is with the staff.. they are not so responsive.. we've ordered one item but we got something else.. otherwise place and the food are good..	Negative

Activate Windows

FEATURE EXTRACTION

TF-IDF Vectoriser converts a collection of raw documents to a matrix of TF-IDF features

```
## TF-IDF Vectoriser converts
vectoriser = TfidfVectorizer(analyzer='word', ngram_range=(1,2), max_features=500000)

## Tranforming the dataset
train_features = vectoriser.fit_transform(train_clean_tweet)
test_features = vectoriser.transform(test_clean_tweet)
```

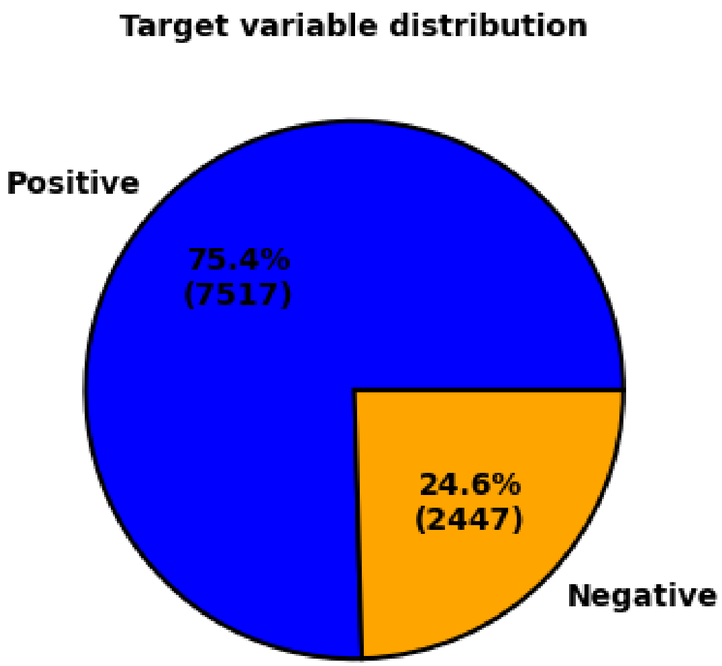
analyzer='word':
analyze text, word by word
for example : “I” “likes” “food”

ngram_range = (1,2)
analyze text, unigram and bigram
for example : “I” “likes” “food”
and
“I likes”

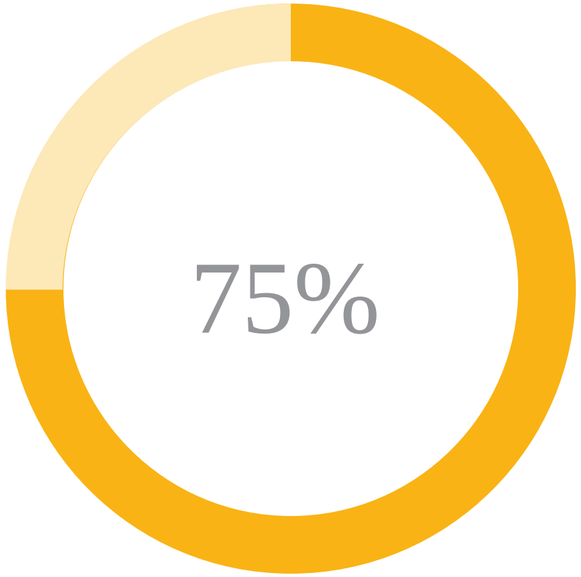
max_features = dimensions of vector representation

CSAT

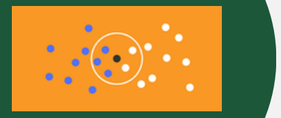
CUSTOMER SATISFACTION INDEX



Portion Sentiment
Positive & Negative



Classification Models

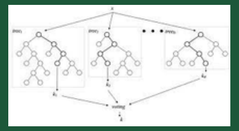


4th Quarter

KN Neigbors Classifier

3rd Quarter

Decision Tree Classifier



2nd Quarter

Random Forest Classifier

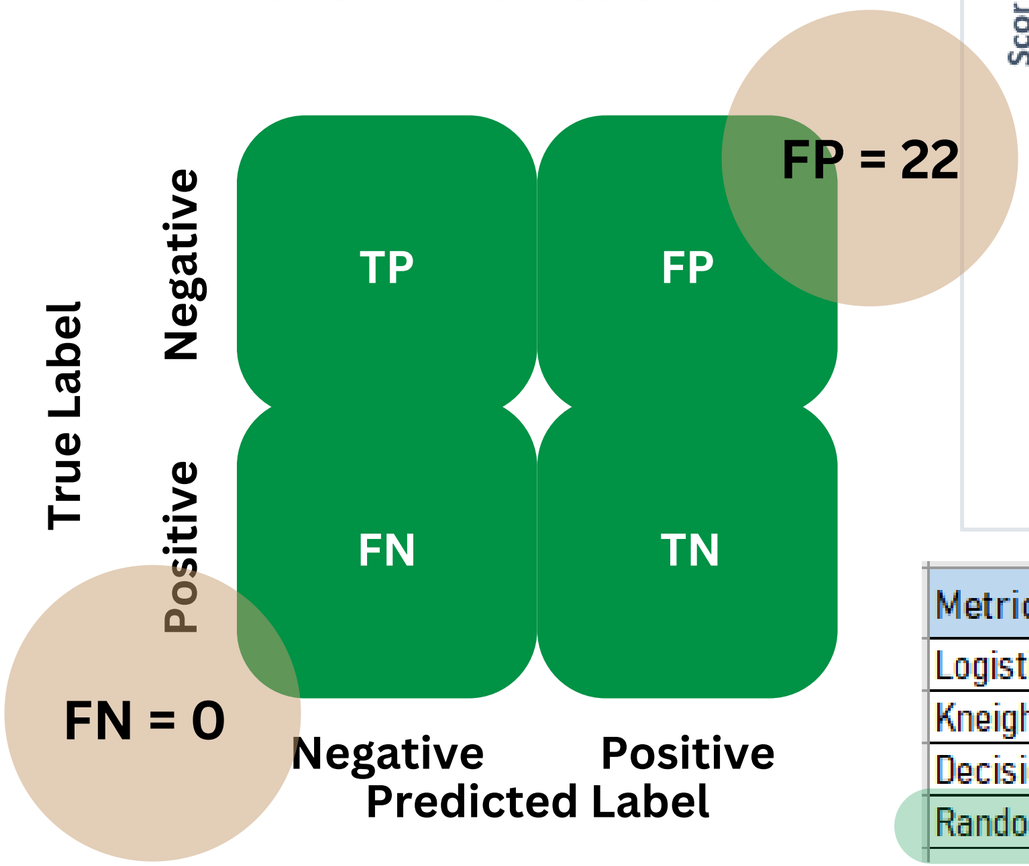
1st Quarter

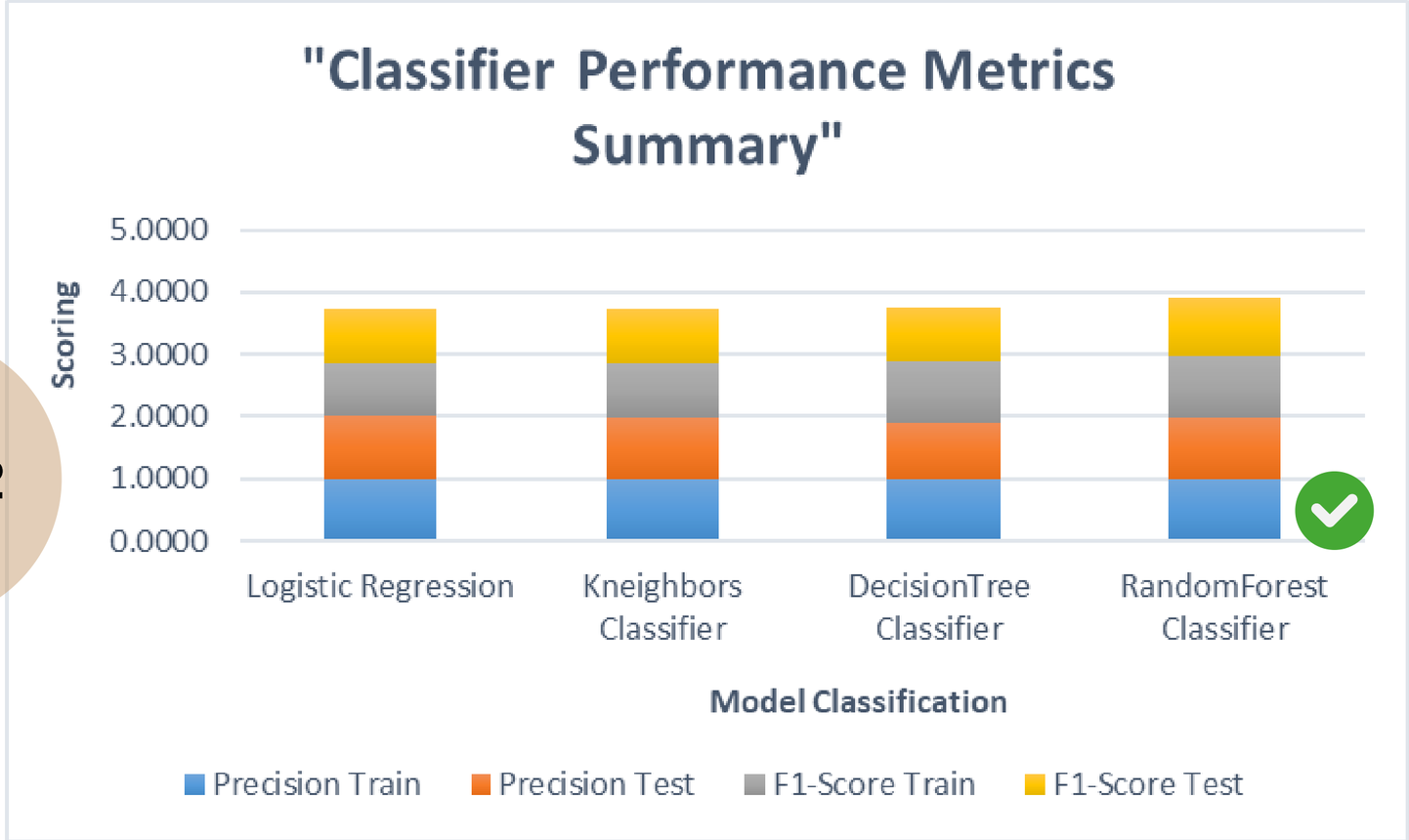
Logistic Regression

METRICS

EVALUATION

Random Forest Classfier





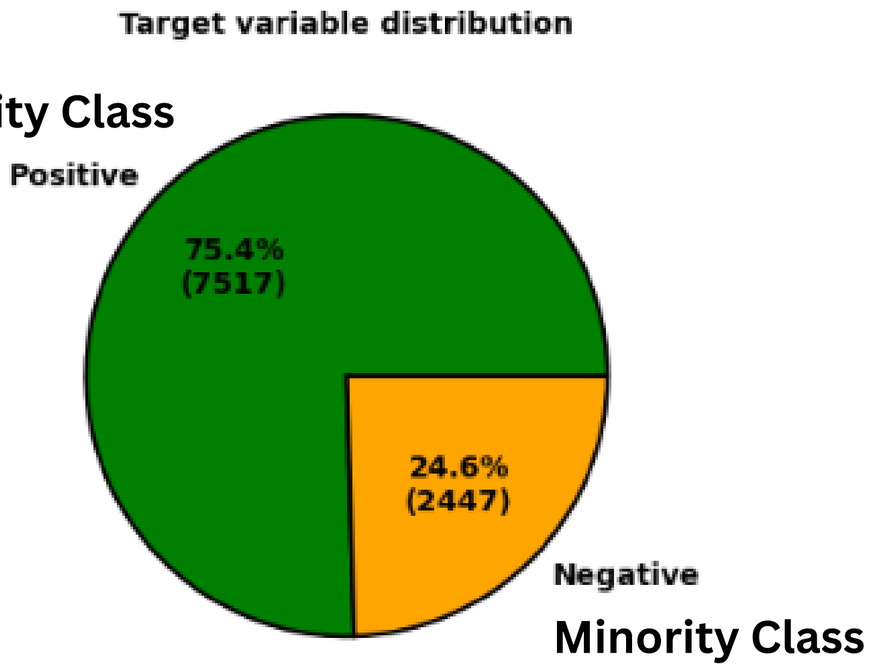
Metrics:	Precision Train	Precision Test	F1-Score Train	F1-Score Test
Logistic Regression	1.0000	1.0000	0.8595	0.8621
Kneighbors Classifier	0.9993	0.9974	0.8643	0.8653
DecisionTree Classifier	0.9992	0.8828	0.9982	0.8851
RandomForest Classifier	1.0000	0.9795	0.9982	0.9290

IMBALANCE

DATASET HANDLING - SMOTE

(SYNTHETIC MINORITY OVERSAMPLING TECHNIQUE)

OVERSAMPLING - SMOTE



IMBALANCE DATASET

```
Original dataset shape: Counter({1: 7517, 0: 2447})
Resampled dataset shape: Counter({'Positive': 6007, 'Negative': 6007})
```

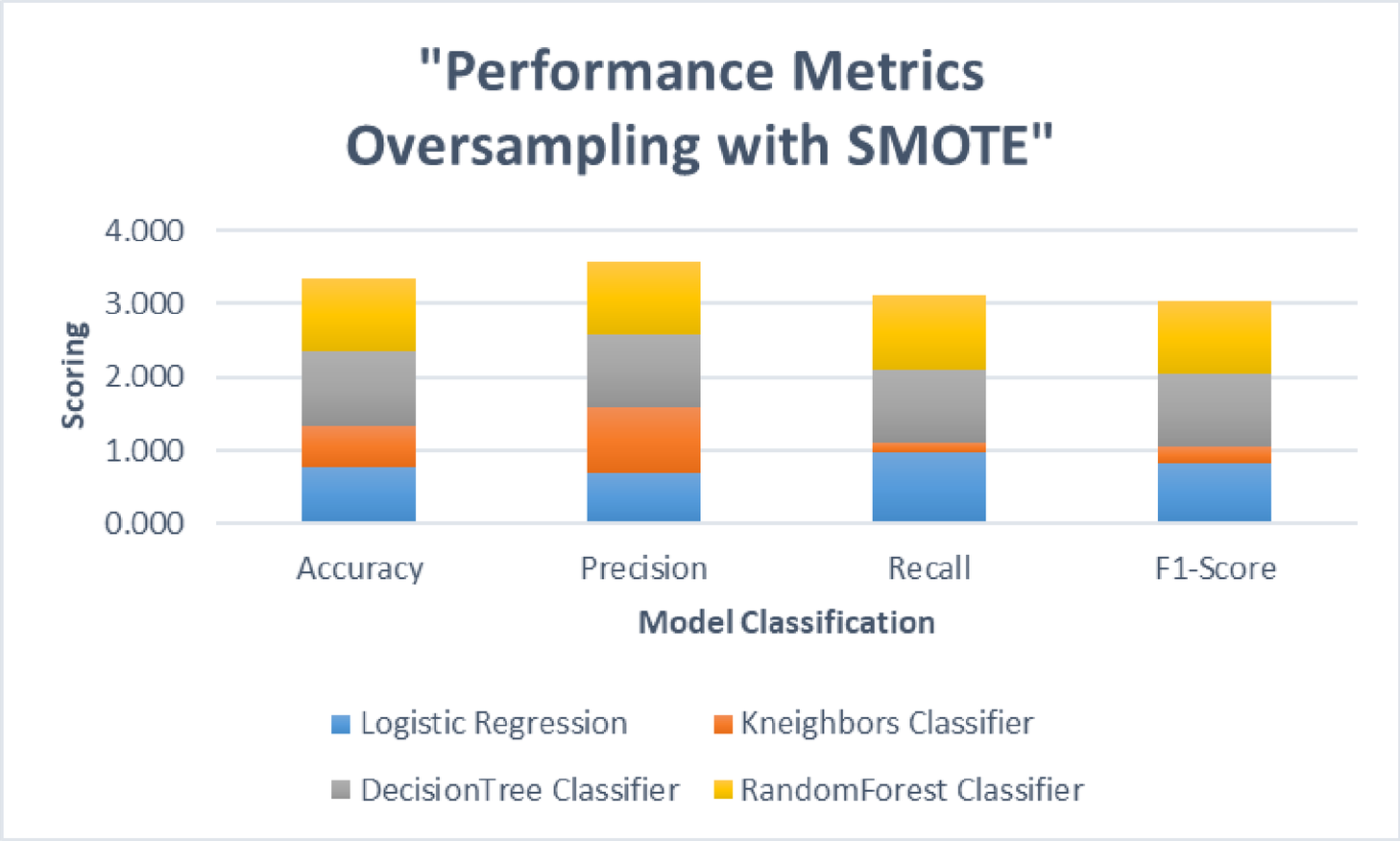
BALANCE DATASET

METRICS

EVALUATION

Conclusion :

These improvements suggest that applying SMOTE oversampling helped address class imbalance and enhance the model's performance in this classification task.



	Oversampling with SMOTE			
Metrics:	Accuracy	Precision	Recall	F1-Score
Logistic Regression	0.783	0.705	0.975	0.818
Kneighbors Classifier	0.555	0.871	0.128	0.224
DecisionTree Classifier	0.998	0.997	0.999	0.998
RandomForest Classifier	0.998	0.997	0.999	0.998

Food cons

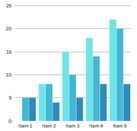
Summary

CSAT

Customer Satisfaction Index - 75.4%

Model Classification

The best model **“Random Forest Classifier”** because is an ensemble learning method that combines the predictions from multiple decision trees. Result : High accuracy and stabil scoring



Metrics Evaluation

High Precision, because Precision Emphasis for Sentiment Prediction: This signifies that the model tends to avoid producing a high number of False Positives (FP), which are cases where the model predicts positive when it should have been negative.

Dataset

The dataset polarized towards either positive or negative sentiment.

Food cons

Future Work

Business Owner

Next project, in the future customers written review directly generate the ratings using a positive or negative sentiment approach. **#RATAO**- RATING AUTOMATION

Resto Management

Using a review approach will be more appropriate for risk mitigation and maintan credibility.

Review Express is an automation tool that sends review requests via email. You can add private surveys to the emails and ask for deeper feedback.

Investor

Summary sentiment analysis