

Predicting Restaurant Business Success in Pennsylvania

Team 23

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Contents

Introduction



EDA



**Topic Modelling &
Sentiment Analysis**



Predictive Analysis

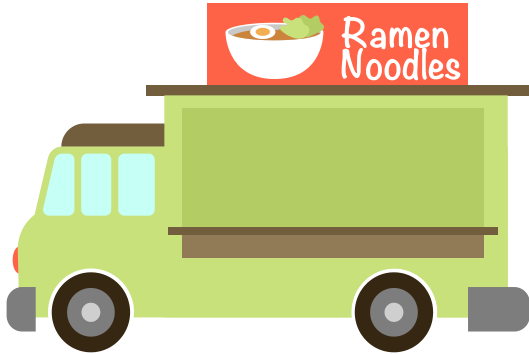


Scope



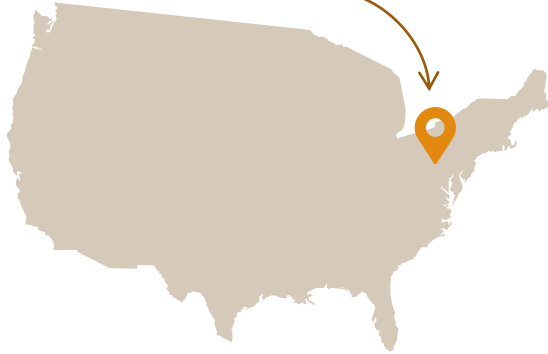
Business

Restaurants



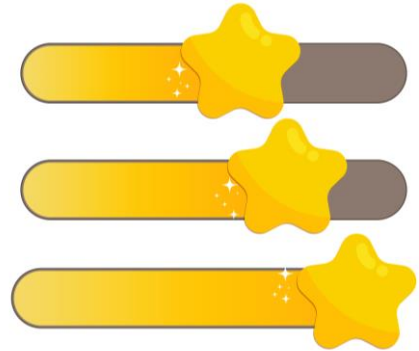
Geography

Pennsylvania



Data

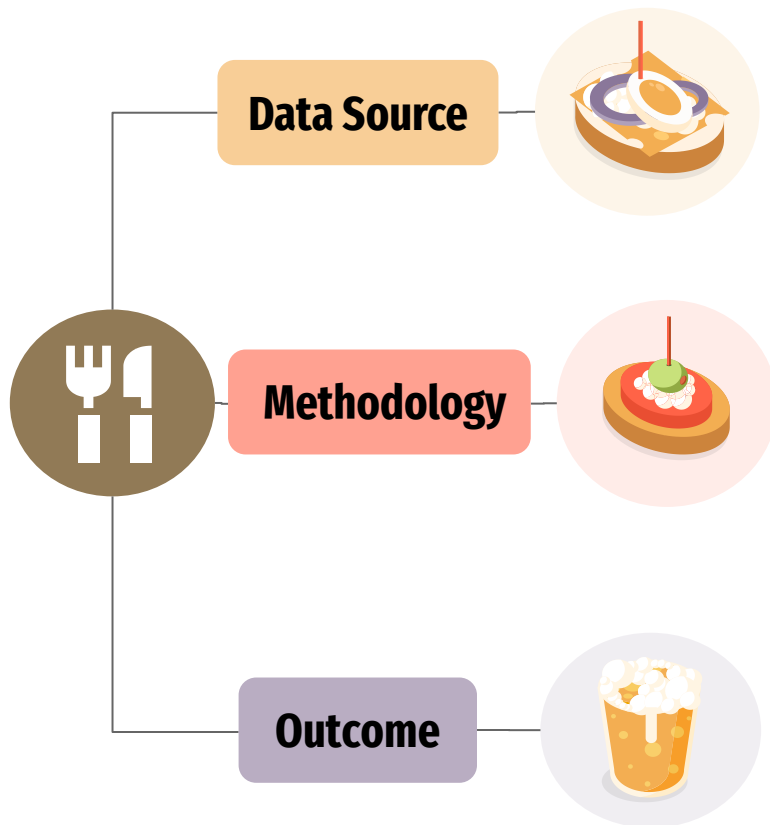
Business Attributes,
User Reviews



Introduction

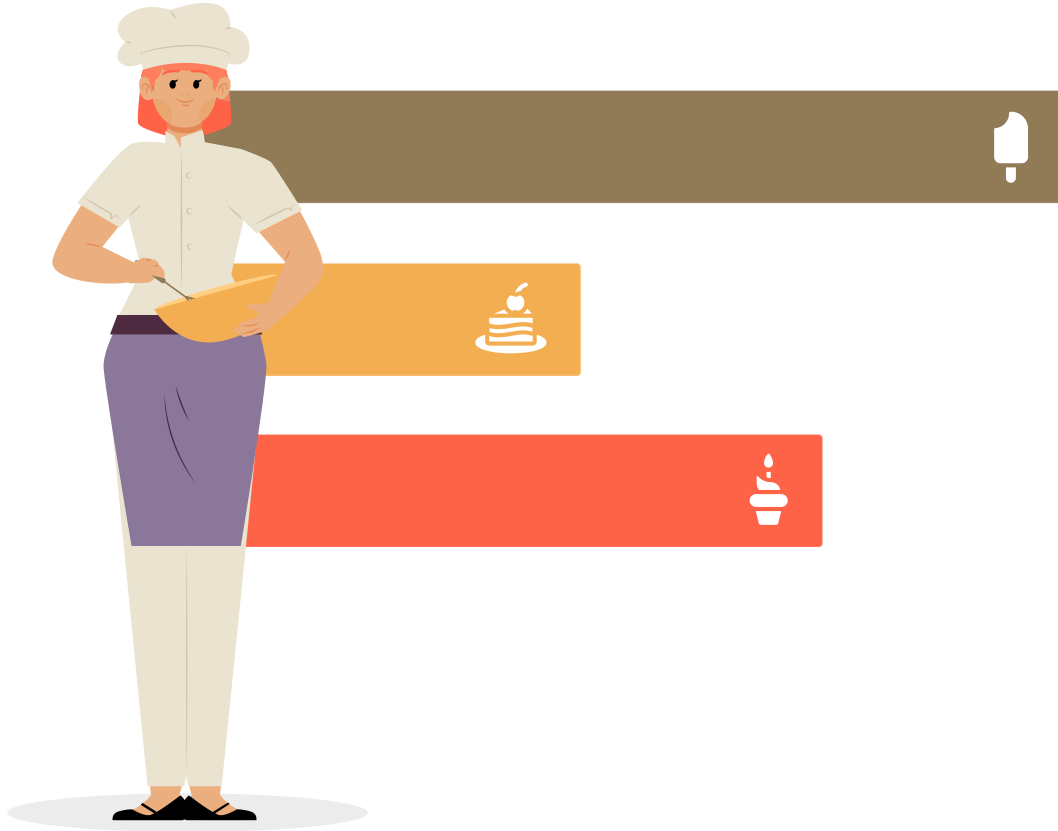
Objective

Build a data-driven model for predicting business success, gauged by customer ratings and reviews.



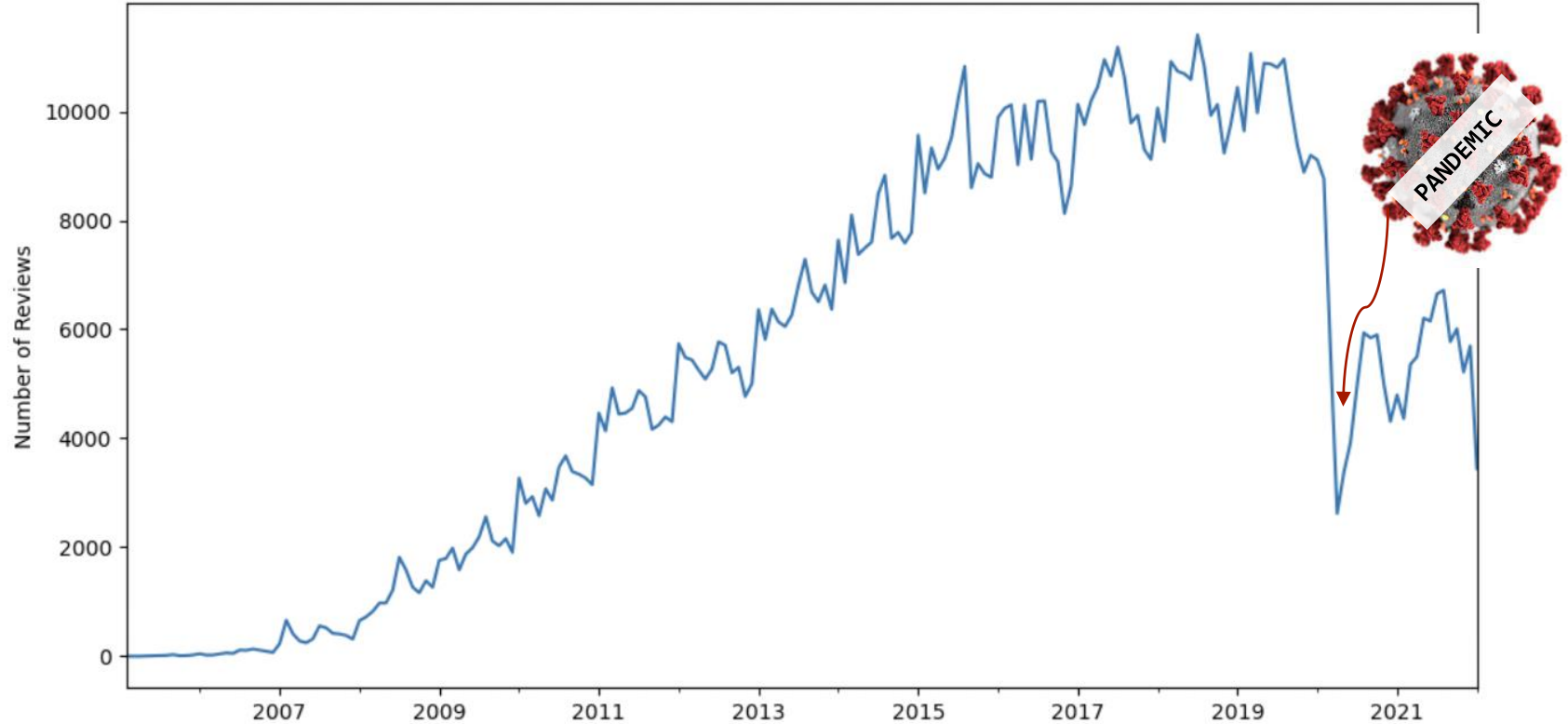
Yelp dataset

- Business attributes
 - Customer reviews
 - Ratings
-
- Data Pre-processing
 - Defining Success
 - Feature Selection
 - Model Development
 - Model Evaluation
 - Analysis
-
- Predictive model with reasonable accuracy
 - Actionable insights to thrive

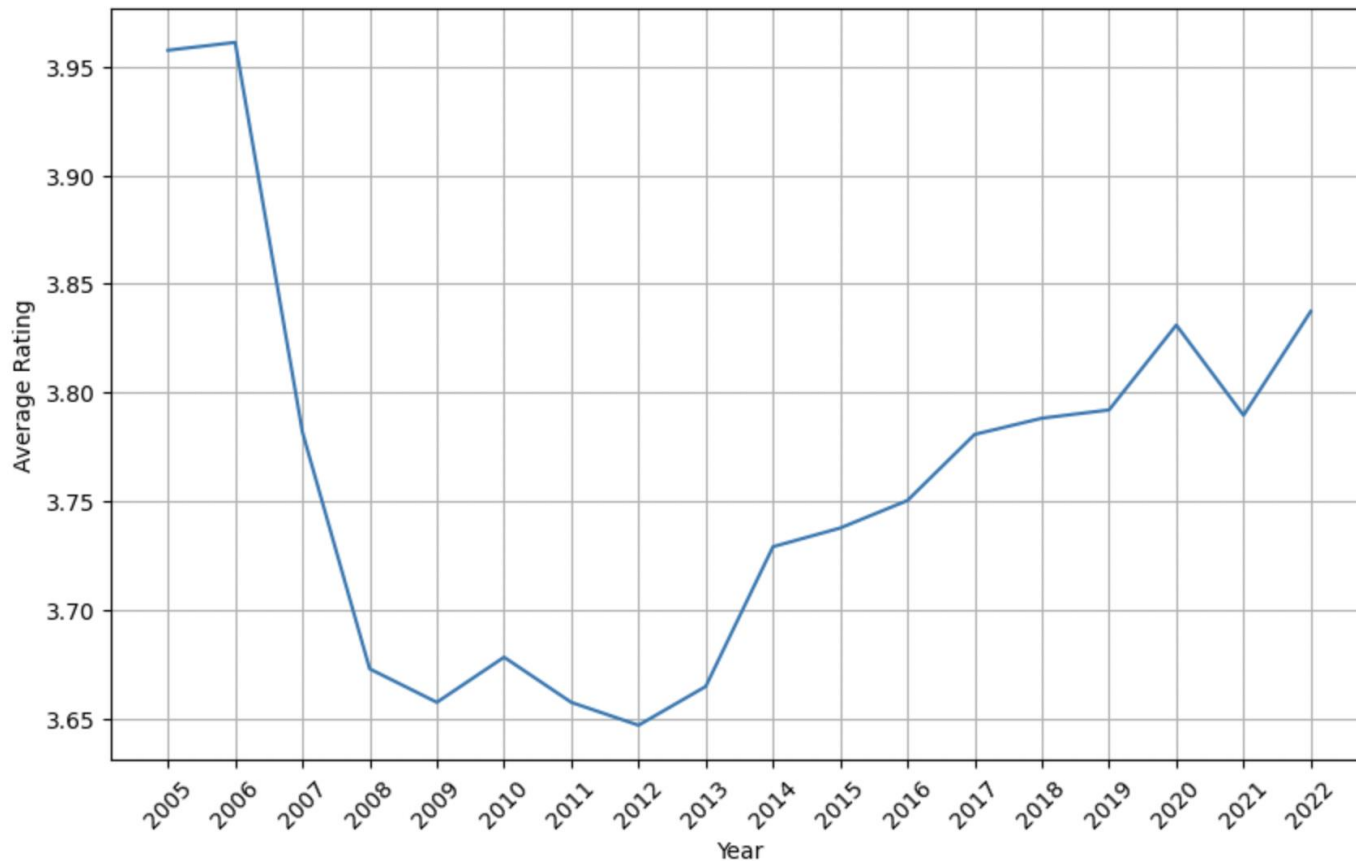


Exploratory Data Analysis

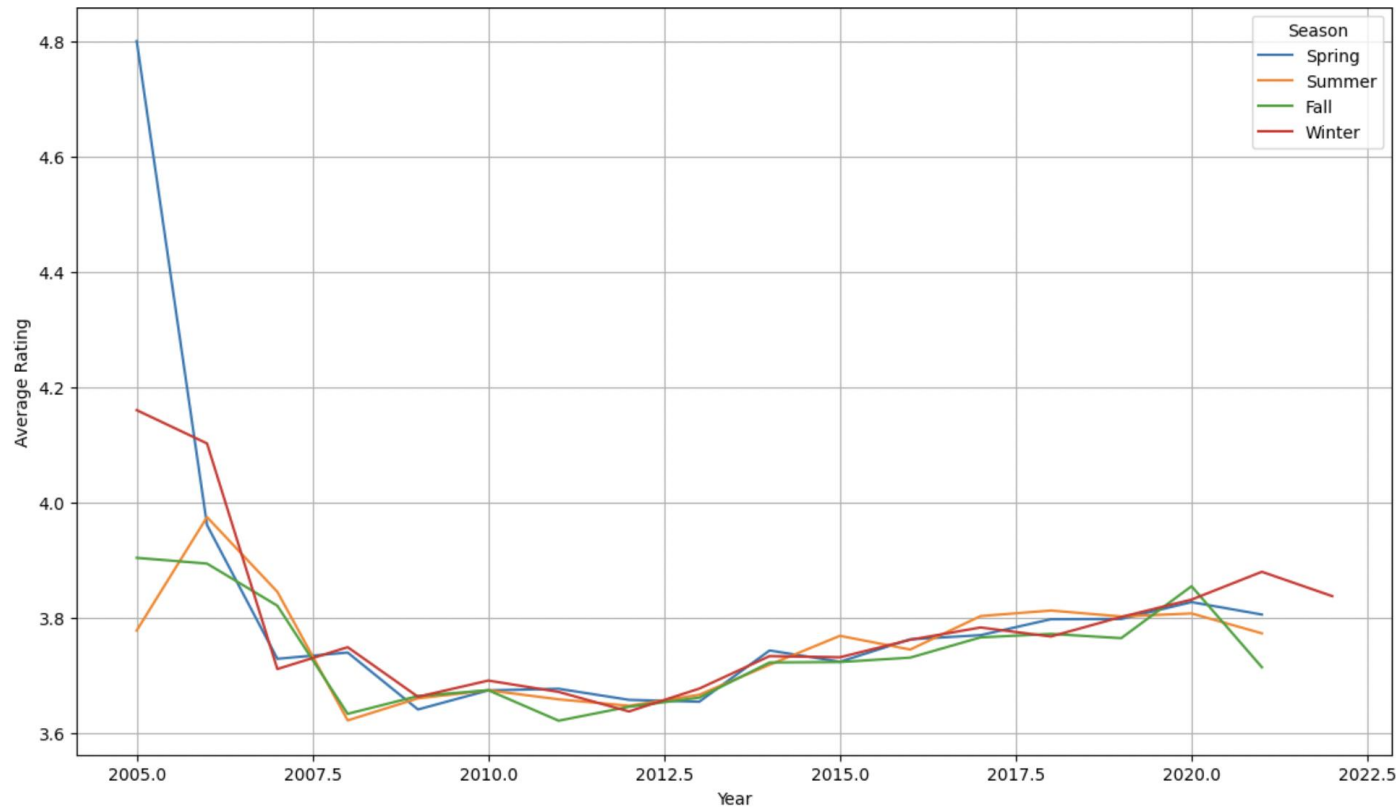
No. of Reviews Over Time in PA



Stability of Restaurant Rating



Seasonal Average Rating



Sentiment Analysis

77 %

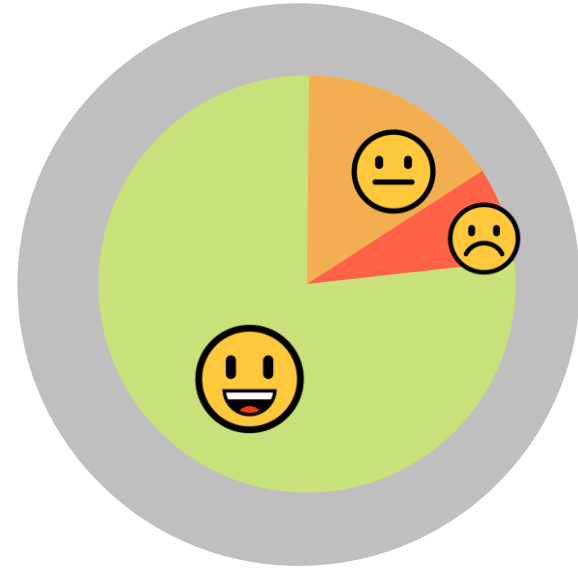
Positive

16 %

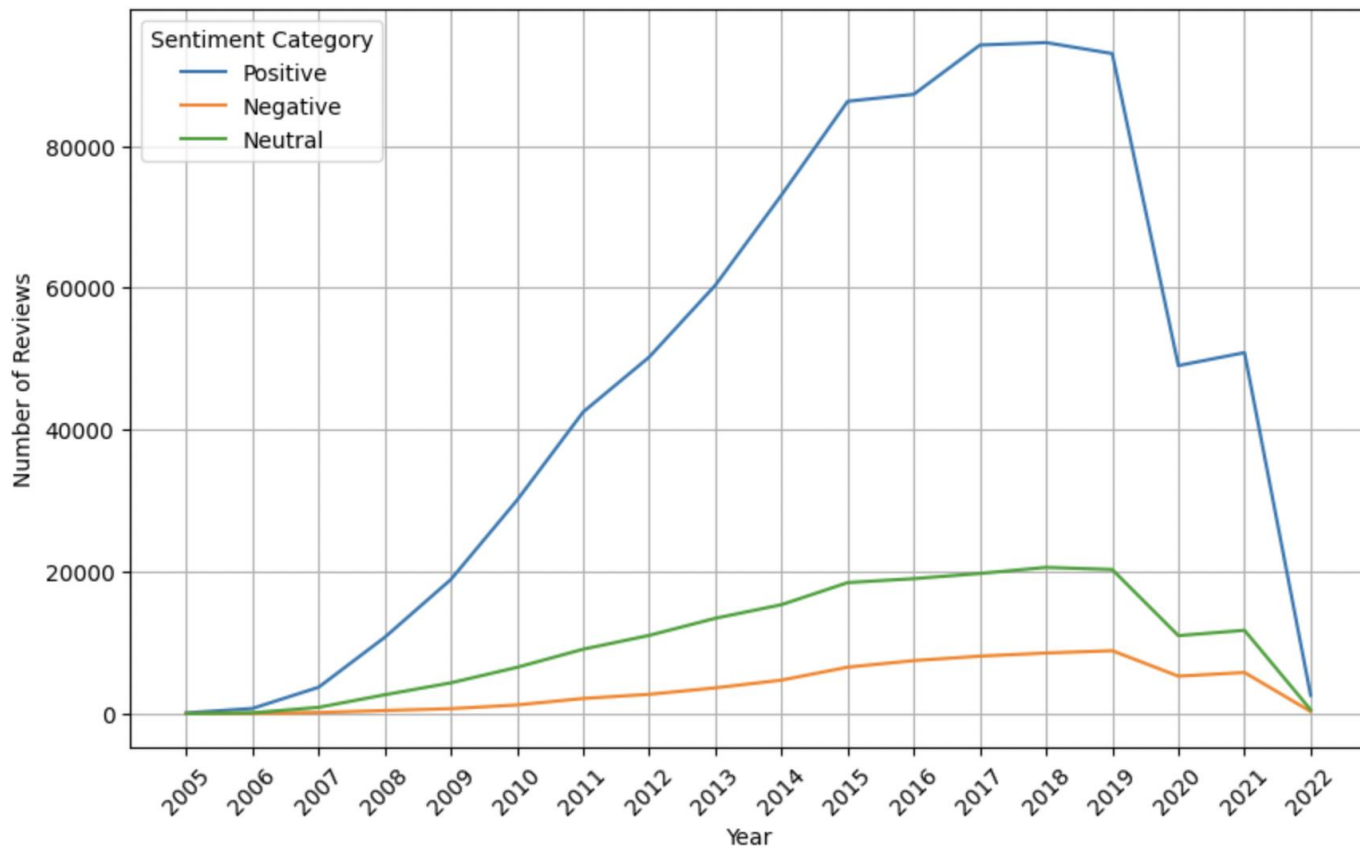
Neutral

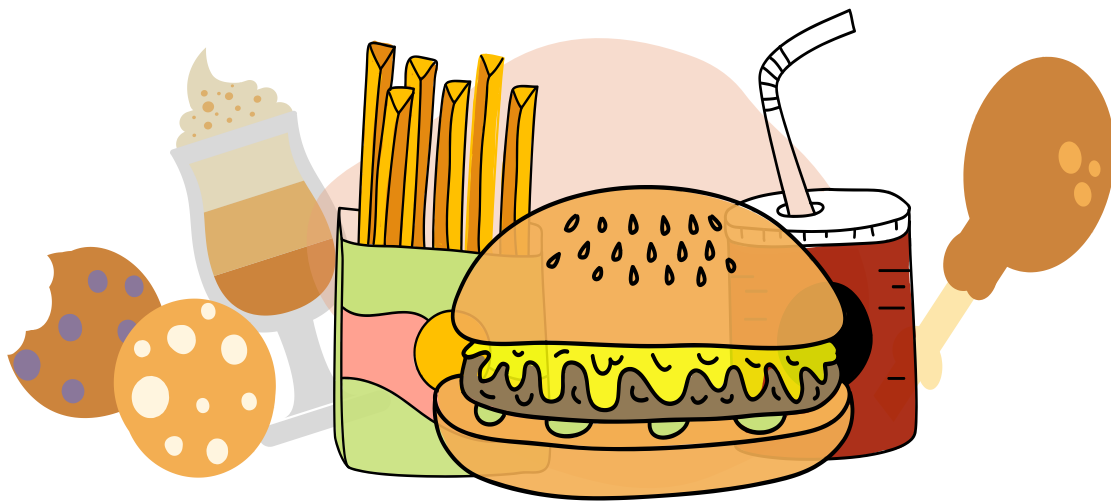
6 %

Negative



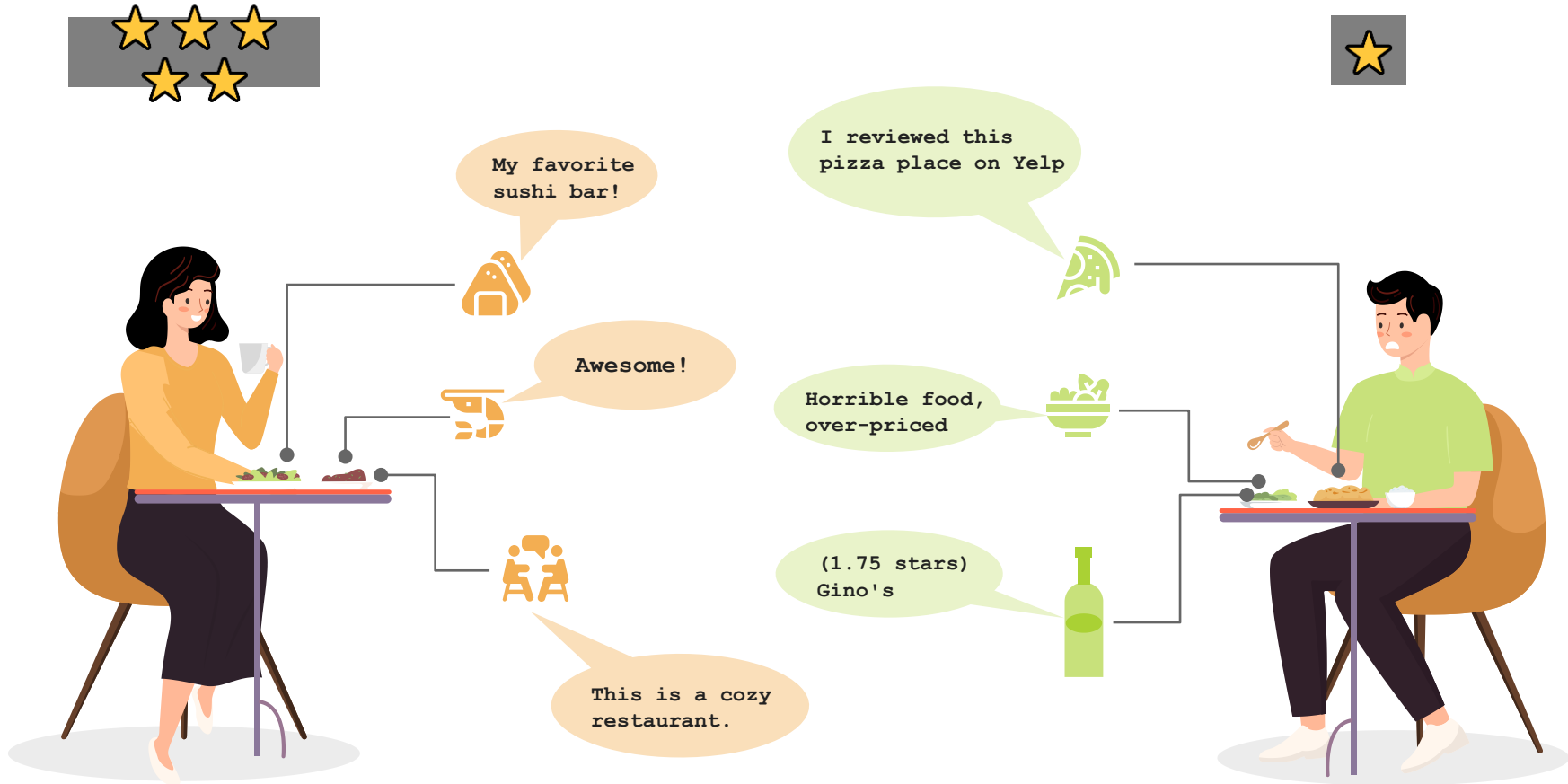
Sentiment Trend



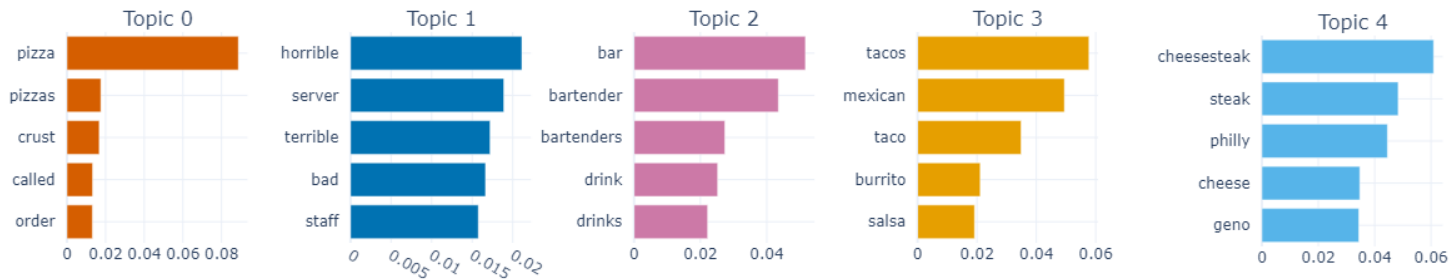
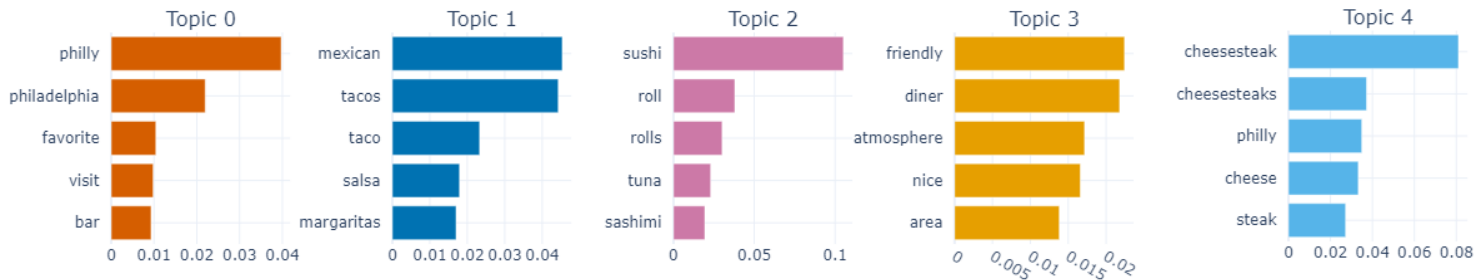


Topic Modelling

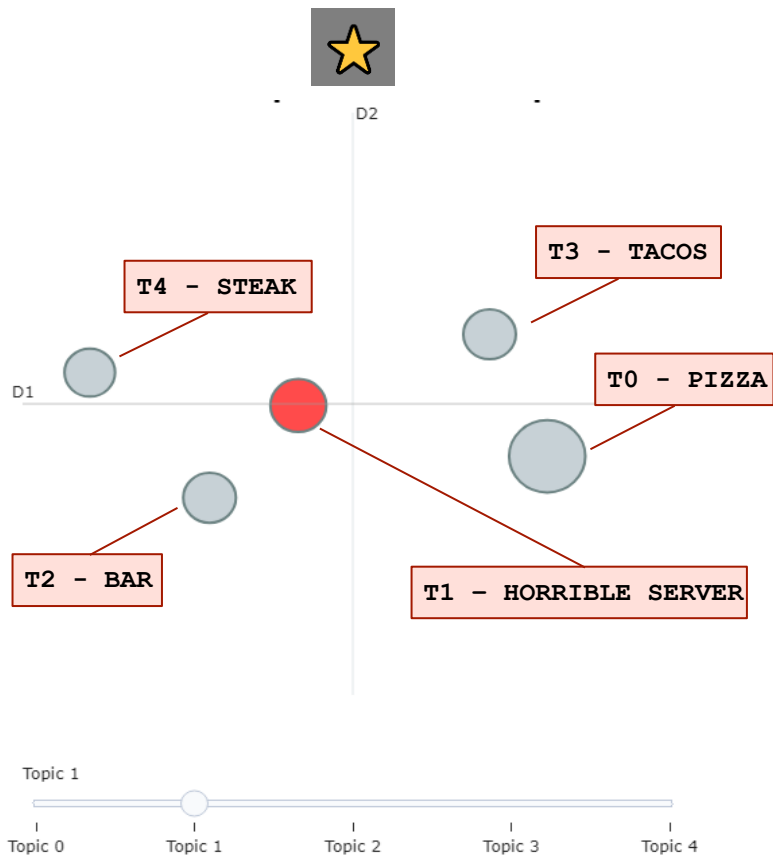
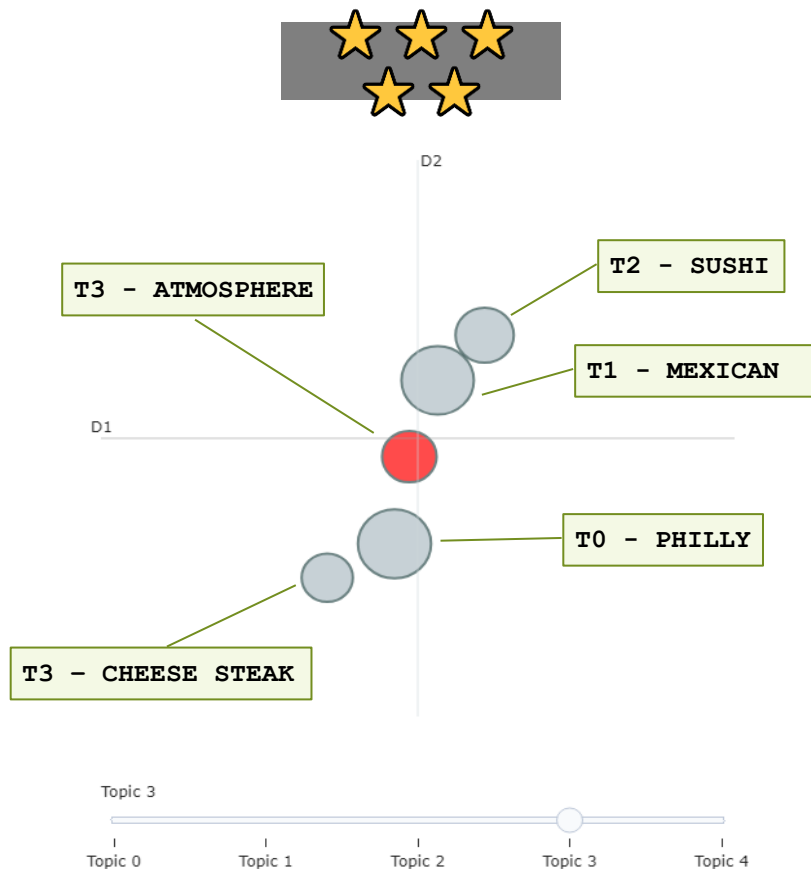
Representation



Topic Word Score



Inter-topic Distance Map





Predictive Modeling

Features used for Predictive Modelling

Is_Successful

A variable indicating the success

01

Ratings

Average rating of the business

03

Dominant_Topic

Most dominant topic for each business

05

2005-2022

Yearly average star ratings

07

Review_count

Total no. of reviews the business received

02

0-4

Normalized score of top topics

04

0-4 Sentiment

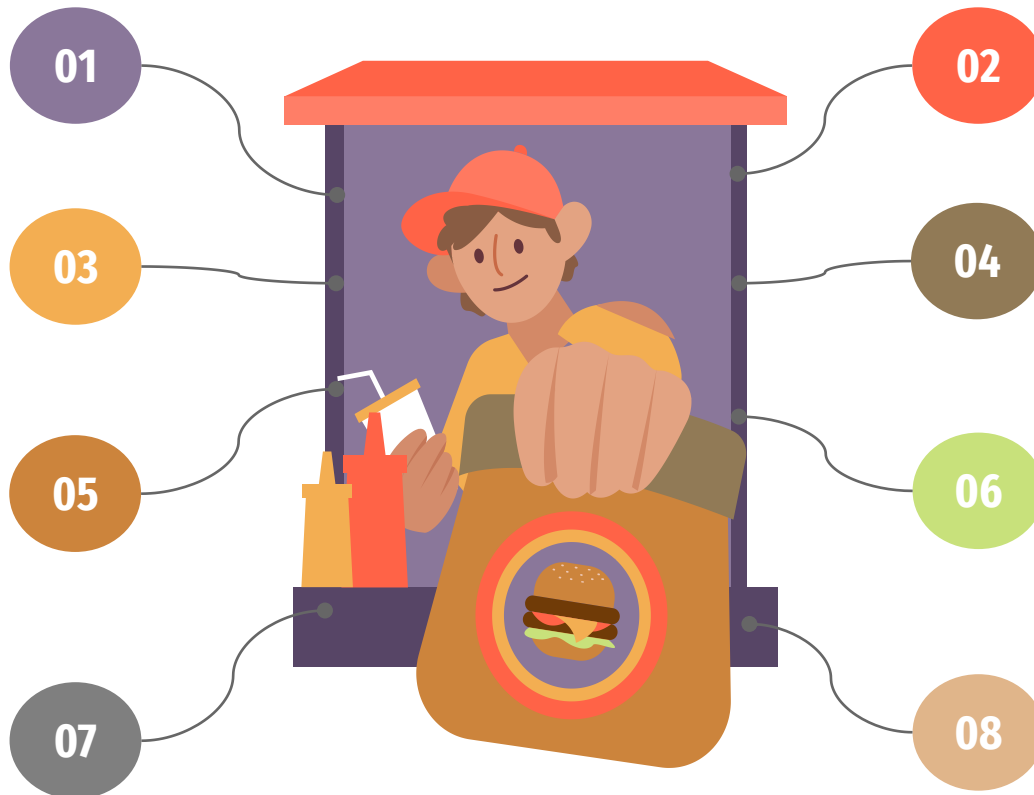
Average sentiment scores for top topics

06

Yearly_Sentiment

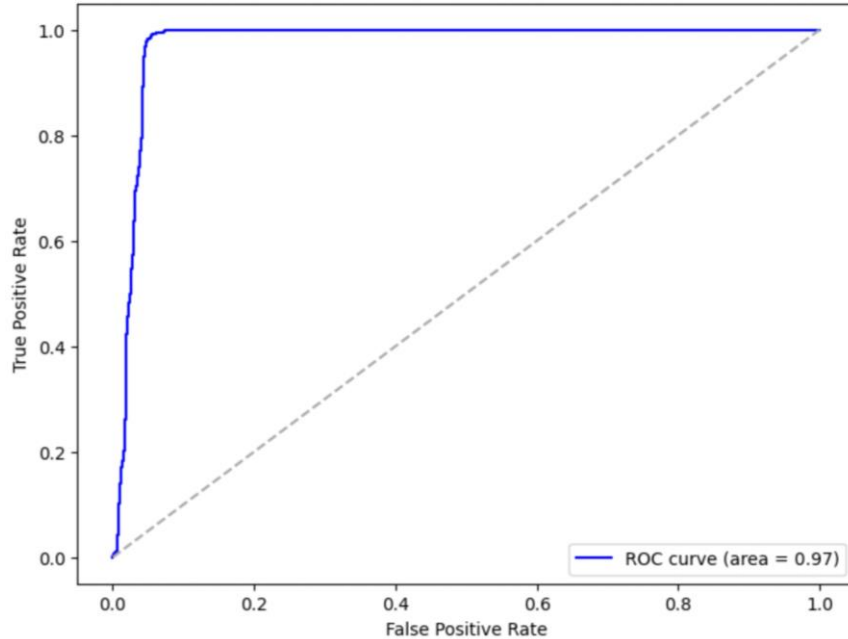
Yearly average sentiment scores

08



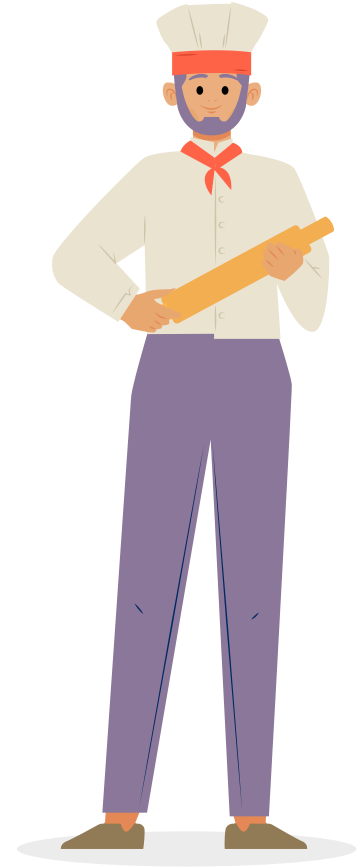
Results

ROC Curve



Accuracy

Used logistic regression to achieve **93.5%** accuracy



Conclusion

New Restaurant

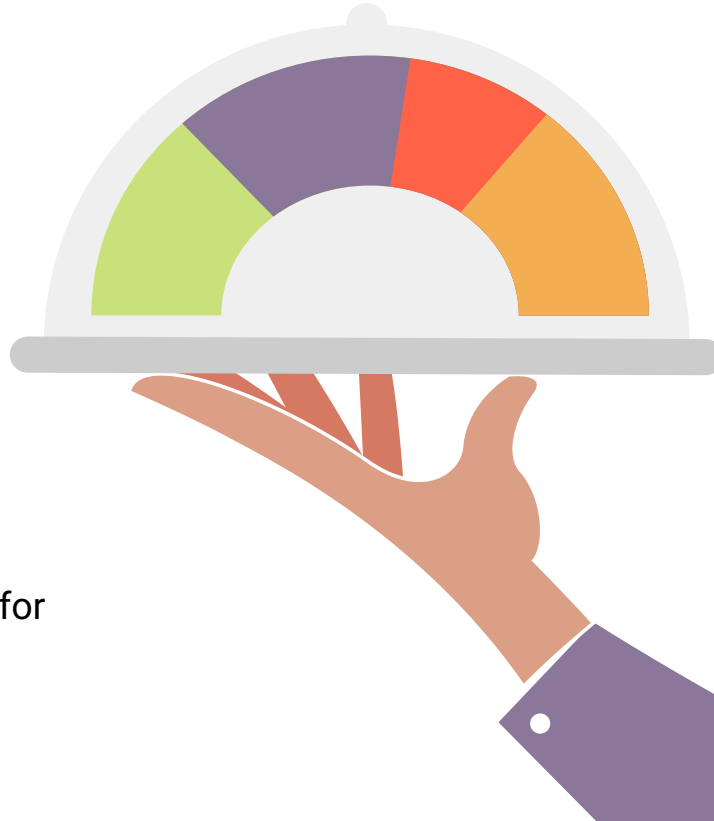
Mexican & Japanese

Based on top 5 topics in 5-star reviews, we can suggest opening a new restaurant

Careful Consideration

Menu & Service

Based on 1-star reviews, service and menu are things to consider for a restaurant business



Atmosphere

Aesthetic & Welcoming

Ambience and greeting play a huge role in having a positive experience

Bar

Good & Bad

Bar is common in both 1- and 5-star reviews, while the good ones soar, the bad ones plummet

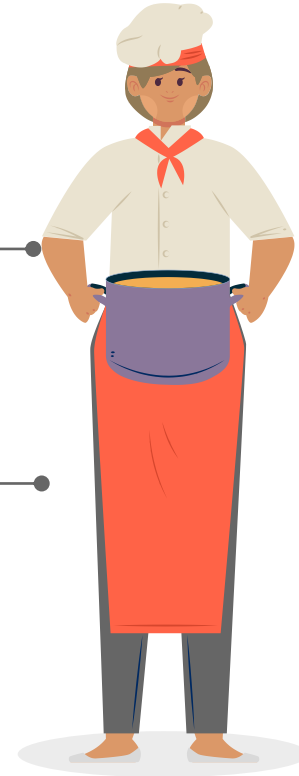
Recommendations

Monitoring Continuous Improvement

Conduct periodic reviews to understand and improve according to customer preferences

Flexibility Shock Absorbers

Build a flexible and profitable business model to withstand the adverse effects of market





THANK YOU!