



# SENTIMENT ANALYSIS OF CUSTOMER FEEDBACK OF RESTAURANTS USING IBM CLOUD

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# **1. INTRODUCTION:**

A typical regression Machine Learning project leverages historical data to predict insights into the future. The problem statement is aimed at analysing sentiment of Customer feedback given to the restaurants.

This technology processes the logical structure to identify the most relevant elements in text and then understand the topic discussed. The sentiment analysis is also known as opinion mining, in which the opinions, appraisals, emotions or attitude towards a topic, person or entity are analyzed. The expressions can be classified as positive, negative or neutral. For example: "I really liked the garlic noodles of your restaurant" - this is a positive expression. This makes it easy to gather product reviews from a website and understand what consumers are actually saying as well as their sentiment in reference to a specific product. Restaurants with a large volume of reviews can actually understand them and use the data collected to recommend new products or services based on customer preferences.

## **1.1 OVERVIEW**

Evolution of the Internet in the past decade resulted in generation of voluminous data in all sectors. Due to these advents, the people have new ways of expressing their opinions about anything as reviews. Sentiment analysis deals with the process of computationally identifying and categorizing opinions expressed in a piece of text, especially in order to determine whether the writer's attitude toward a particular topic is positive, neutral or negative. Knowing the opinion of customers is very important for any business. Hence, in this guided project, we analyse the reviews given by the customers of the restaurant with the help of machine learning classification algorithms.

## **1.2 PURPOSE**

Majority of the customers will follow and choose the best restaurants on the basis of reviews and ratings. As a result, reviews play a crucial role in any system. The approach to this problem is based on review text content analysis and uses the principles of natural language process (the NLP method) and Machine learning. After applying the above method, we can classify whether it is a positive review or negative review and can also visualize the total no of positive reviews and negative reviews. We have worked on developing an algorithm that can help in classifying the reviews on the basis of positive and negative reviews with the help of a predefined dictionary of words.

## **2. LITERATURE SURVEY**

### **2.1 EXISTING PROBLEM**

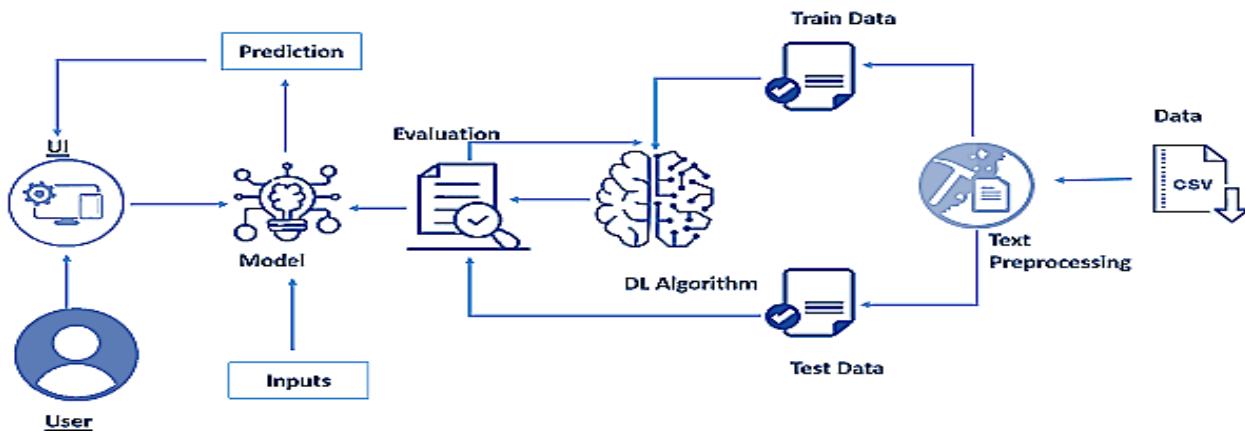
Restaurants nowadays prefer taking online orders. It not only helps in getting effective customer feedback but also useful for managing orders easily. We are moving towards an automated and digital world. Having a significant online presence is necessary for any restaurant to be successful and prosperous. The major problem with the increasing number of restaurants is to find the good restaurants that provides customers

### **2.2 PROPOSED SOLUTION**

Getting customer feedback and analysing them in an effective manner makes the difference. This study analyses the restaurant reviews and presents useful information that the ratings do not consider or overlook. Thus, analysing results can predict good restaurant. The online ratings are primarily focussed rather than conventional day -to-day reviews which does not stay for long time, and its trueness is difficult to find out. A web Application is created where user can enter their feedback, the entered text is analysed by the model built and prediction is showcased on UI.

# 3 THEORITICAL ANALYSIS

## 3.1 BLOCK DIAGRAM



## 3.2 HARDWARE/SOFTWARE DESIGNING

- SPYDER - IDE
- FLASK FRAMEWORK
- IBM CLOUD

# 4. EXPERIMENTAL ANALYSIS

## DATA COLLECTION

Collecting data allows you to capture a record of past events so that we can use data analysis to find recurring patterns. From those patterns, you build predictive models using machine learning algorithms that look for trends and predict future changes.

Predictive models are only as good as the data from which they are built, so good data collection practices are crucial to developing high-performing models. The data need to be error-free (garbage in, garbage out) and contain relevant information for the task at hand.

## TEXT PRE-PROCESSING

Apart from numerical data, Text data is available to a great extent which is used to analyze and solve business problems. But before using the data for analysis or prediction, processing the data is important. To prepare the text data for the model building we perform text preprocessing.

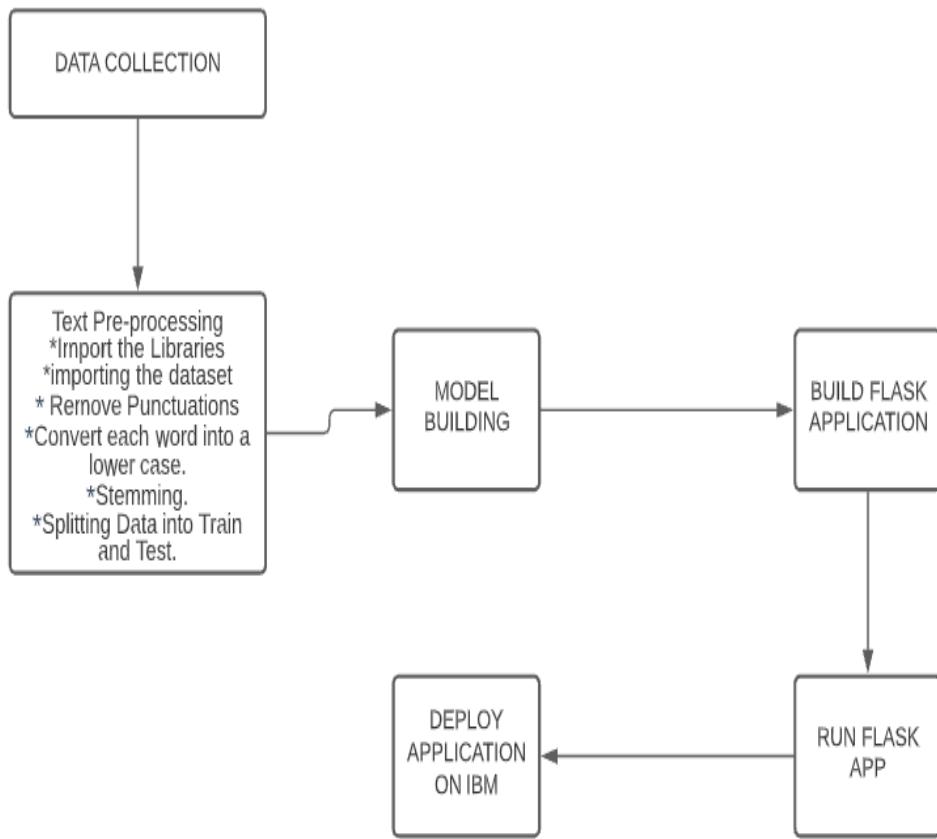
## BUILDING MODELS

A machine learning model is built by learning and generalizing from training data, then applying that acquired knowledge to new data it has never seen before to make predictions and fulfill its purpose. Lack of data will prevent you from building the model, and access to data isn't enough.

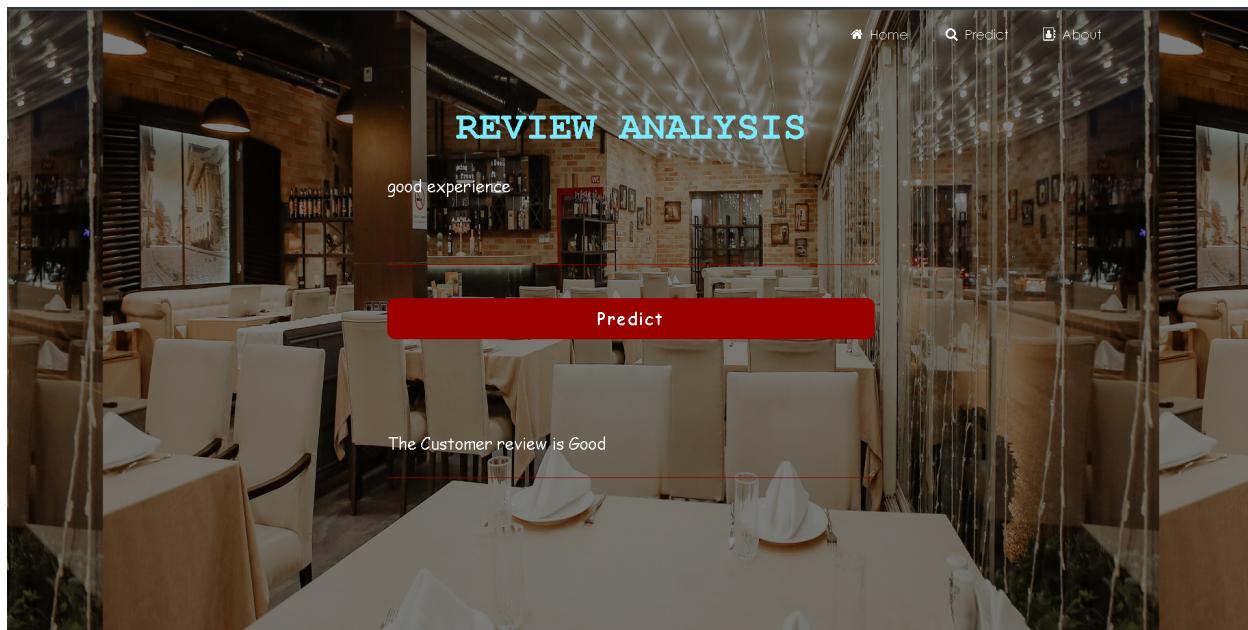
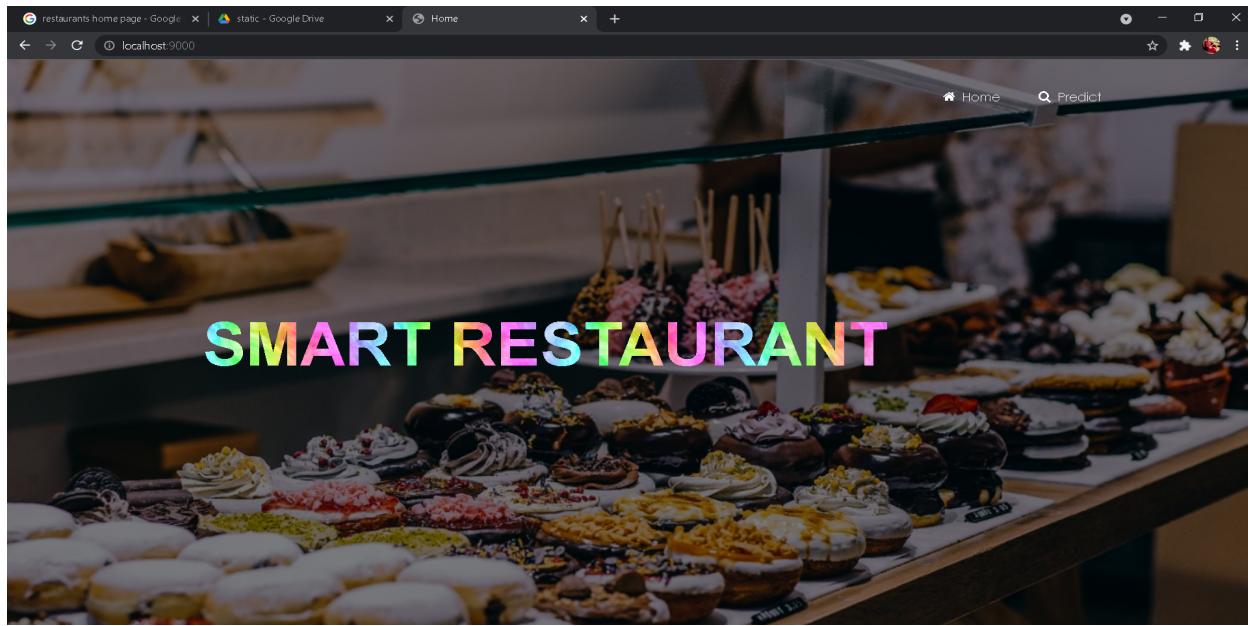
## BUILDING APPLICATION

Flask is a small and lightweight Python web framework that provides useful tools and features that make creating web applications in Python easier. It gives developers flexibility and is a more accessible framework for new developers since you can build a web application quickly using only a single Python file. Flask is also extensible and doesn't force a particular directory structure .

## 5. FLOWCHART



## 6.RESULT





Zomato Review Analysis

The moto of our project is to check whether a given feedback is positive or negative.  
In today's digital world, a food app like Zomato is widely used because it provides a platform for people to share their opinion about the restaurants and cafes they have visited and find a place to enjoy;  
The feed back is categorised into 3 types as below:

**Positive Feedback**

**Neutral Feedback**

**Negative Feedback**

## **7. ADVANTAGES AND DISADVANTAGES**

**Advantages:**

1. Openly given reviews by verified customers.
2. Better analysis of reviews and ratings.
3. Various restaurants collect the analysed data and decide what works for customers.
4. Efficient handling of data.

**Disadvantages:**

1. Increasing rate of data with limited resources.
2. Dataset which we have used here, is not customised for every region.
3. Every region has different restaurants with varying number of ratings and reviews.
4. Ever-shifting variations can happen in rating and reviews of the restaurants.

## **8. APPLICATIONS**

In essence, the sentiment analysis application brings additional flexibility and insight into the presentation of the Restaurants . It allows them to:

- track the perception of the Reviews by the customers;
- point out the specific details about the attitude;
- Find patterns and trends;
- keep a close eye on the presentation by the influencers.

## **9. CONCLUSION**

The proposed work starting from the analysis of different studies provided in the literature, provides a classification of sentiment classification approaches with respect to features/techniques and advantages limitations, tools for sentiment analysis with respect to the different techniques used for sentiment analysis.

The sentiment classification approaches can be classified in machine learning, lexicon based and hybrid approach. The main learning approach is used for predicting the sentiments based on trained and test data sets.

## **10. FUTURE SCOPE**

In the future, more work is needed on a real-time large dataset to perform further improving measures and sometimes positive text also analyzed as negative or neutral and to classify reviews into multiple sentiment categories such as happy, mad, angry, Thrilled, depressed, frustrated, satisfied, confused, etc. This could further studied for other factors such as the use of other languages, dealing with negation expressions, including emojis, Sarcasm detection, and the complexity of sentence document

## **11. BIBLIOGRAPHY**

1) Dataset

[https://drive.google.com/file/d/1t38NWBhOLfIGnmjHiJ9bcgZwP\\_f8dI0b/view?usp=sharing](https://drive.google.com/file/d/1t38NWBhOLfIGnmjHiJ9bcgZwP_f8dI0b/view?usp=sharing)

2) Code Reference

<https://drive.google.com/drive/folders/1k9RDYjdFNcizISXYTJ1vn1yXNT2P0oBf>

3) Understanding ML Models

<https://medium.com/@alparslankapani/understanding-ml-classification-models-e16c69acb76d>

4) IBM Cloud

<https://www.ibm.com/in-en/cloud/get-started>

## **11. APPENDIX**

Source Code

<https://drive.google.com/drive/folders/1k9RDYjdFNcizISXYTJ1vn1yXNT2P0oBf>

