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Sentimental Analysis on Food Review Using Machine Learning Approach

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ABSTRACT: Customer satisfaction is the key in assessing how a product or service of a company meets customer expectations and is an important tool that can give organizations major insights into every part of their business, thus helping them to increase earnings or minimize marketing expenses. The growth of web contributes a huge quantity of user created content such as customer feedback, opinions, and reviews. Sentiment analysis in web embraces problem of aggregating data in the web and extraction about opinions. Studying the opinion of customers helps to determine the people feeling about a product and how it is received in the market. Review or opinion is a text which expresses the user's thought and response to the product or service he/she has availed or purchased. Processing this input and getting to know whether these sentiments are positive, negative, is called sentiment analysis. The reviews are then used by data analysts to perform evaluations about the product/service. We classify these sentiments in three principal types positive, negative. Food reviews dataset would be used to train the classifier. Python language is used to conduct research on a carefully chosen data and apply a classification algorithm on it. Pre-processing will be performed on input data and provide as input to the machine learning algorithms to predict its sentimental analysis. Exploratory data analysis will be carried out on dataset to get the particular conclusion in order to decide the algorithm of machine learning.

KEYWORDS: Text detection, Inpainting, Morphological operations, Connected component labelling.

I. INTRODUCTION

Recently there has been number of restaurants when you are on the lookout for a new place to eat, what is the best way to find a great restaurant. Ask someone who has been there, of course. If you do not have someone to personally ask, then you can always turn to online reviews. Customers take many factors into consideration that when deciding where to eat. It's not just about how great the food tastes but how good the service is, how polite the employees are, and how well maintained the facilities are. Sentiment analysis of food reviews is a valuable application of natural language processing and data analytics. It involves assessing and understanding the emotions, opinions, and attitudes expressed in reviews of food and dining experiences. By analyzing these sentiments, businesses and consumers can gain insights into the quality of food and service, helping restaurants improve and helping potential customers make informed dining choices. This analysis typically involves classifying reviews as positive, negative based on the language and sentiments expressed, and it can be a powerful tool for the food industry and food enthusiasts alike. So, the goal is to find trends in how positive and negative reviews are written and come up with a model for their classification.

II. LITERATURE REVIEW

In conclusion, the sentiment analysis conducted on food reviews has provided valuable insights into the effectiveness of the sentiment analysis system in categorizing sentiments expressed in food-related content. Notably, the classification aspect involves the implementation of the naive Bayes algorithm, distinguishing sentiments as positive, negative. This project presents a system to analyze food reviews and determines the sentiment expressed. The system serves as a powerful tool for understanding customer opinions about food, offering valuable insights into customer preferences and satisfaction levels.

In [1] Laksono, R.A., et al. Sentiment Analysis of Restaurant Customer Reviews on TripAdvisor using Naive Bayes. in 2019 12th International Conference on Information Communication Technology and System (ICTS). 2019. IEEE.

In [2], Abbas, M., et al., Multinomial Naive Bayes classification model for sentiment analysis. 2019. 19(3): p. 62.
Hamzah, A.A., M.F.J.J.o.U.S.S. Shamsudin, and Technology, Why customer satisfaction is important to business? Journal of Undergraduate Social Science and Technology, 2020. 1(1).

III. METHODOLOGY

A. System Architecture

Systems Architecture is a generic discipline to handle objects (existing or to be created) called "systems," in a way that supports reasoning about the structural properties of these objects. The system architecture is the conceptual model that defines a system's structure, behavior, and views. An architecture description is a formal description and representation of a system. It provides a broad understanding of the portal. In the system, the architecture database provides functionality like getting information, selecting criteria, etc. to users. The basic architectural diagram of the implemented system. Basically, it consists three main steps, they are:

- Collecting data
- Pre-Processing the data
- Sentiment Analysis

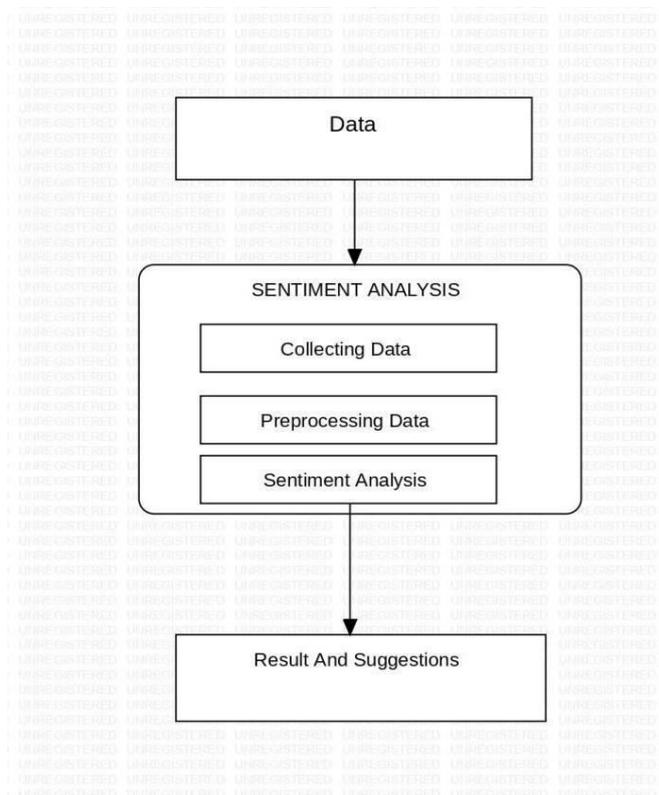


Fig 1: System Architecture

B. Data Flow Diagram

A system flow diagram is a way to show relationships between a business and its components, such as customers (according to IT Toolbox.) System flow diagrams, also known as process flow diagrams or data flow diagrams, are cousins to common flow charts. Flowchart is a graphical representation of an algorithm. Programmers often use it as a program-planning tool to solve a problem. It makes use of symbols which are connected among them to indicate the flow of information and processing. Using flowchart, we can easily understand a program. Flowchart is not language specific.

A Data Flow Diagram (DFD) is a graphical representation of the „flow“ of data through an information system, modelling its process aspects. A DFD is often used as a preliminary step to create an overview of the system, which can later be elaborated. DFDs can also be used for the visualization of data processing (structured design). A DFD shows what kind of information will be input to and output from the system, where the data will come from and go to, and where the data will be stored.

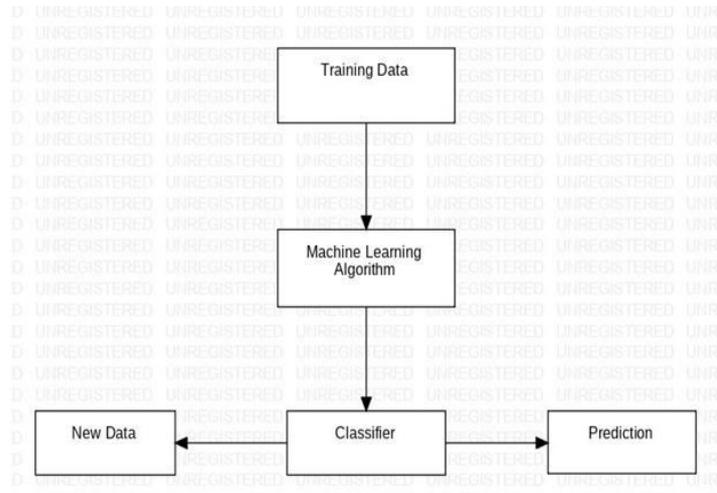


Fig 2: Data flow diagram

C. Use Case Diagram

Use case diagrams are a set of use cases, actors, and relationships. It represents the use case view of a system. A use case represents a particular functionality of a system. Hence, a use case diagrams used to describe the relationships among the functionalities and the internal/external controllers. The controllers are known as actors.

This diagram contains two actor’s customer and vendor.

The customer first will enter details, order food, and then Give feedback to t the system. Vendor will view the feedback, write reply, and delivers food.

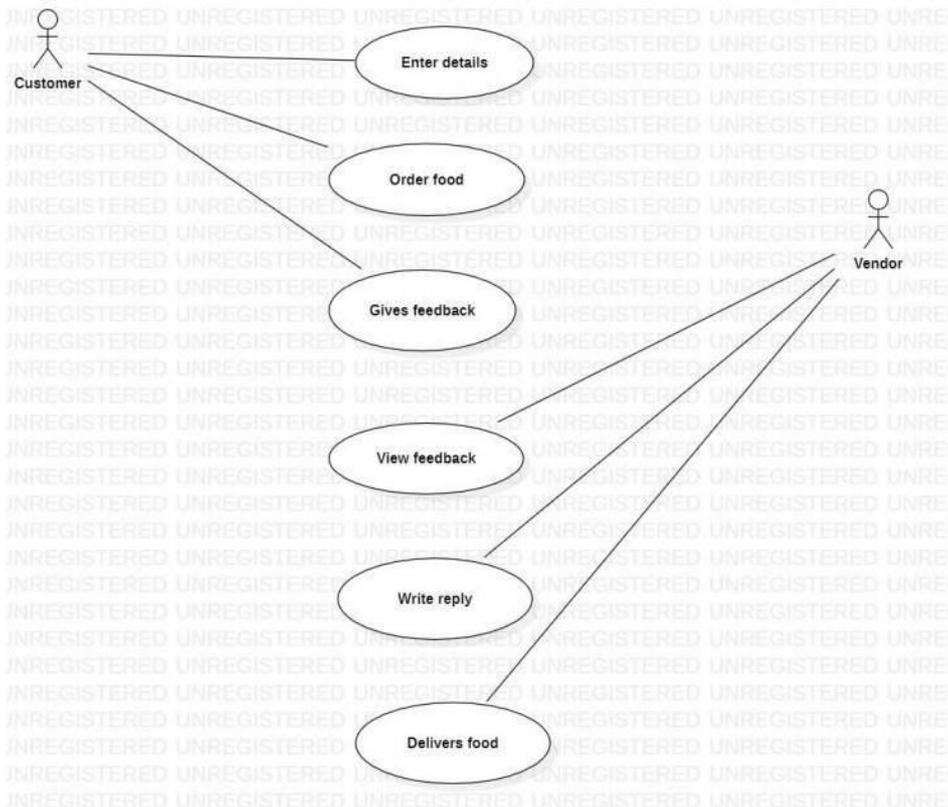


Fig 3: Use Case Diagram

IV. EXPERIMENTAL RESULTS

First, input the review on the web page, Then, analyze it for Sentiment to determine if it is Positive or Negative. Finally Based on the Sentiment analysis Result, the system will indicate whether the review is Positive or Negative.

- **Input Box for Review Text:** The webpage provides a text box where users can input their review text. This box allows users to type or paste their review of a product, service, or experience they want to analyze sentimentally.

- **Review Type Selection Box:**

This feature allows users to specify the type of review they are analyzing. This selection helps tailor the sentiment analysis model to the specific domain, improving the accuracy of the results.

- **Sentiment Analysis Result:** After clicking the "Check" button, the webpage analyzes the review text using a sentiment analysis algorithm or model.

The result is displayed to the user, indicating whether the sentiment of the review is positive, negative, or neutral. This feedback helps users understand the overall sentiment conveyed in their review text.

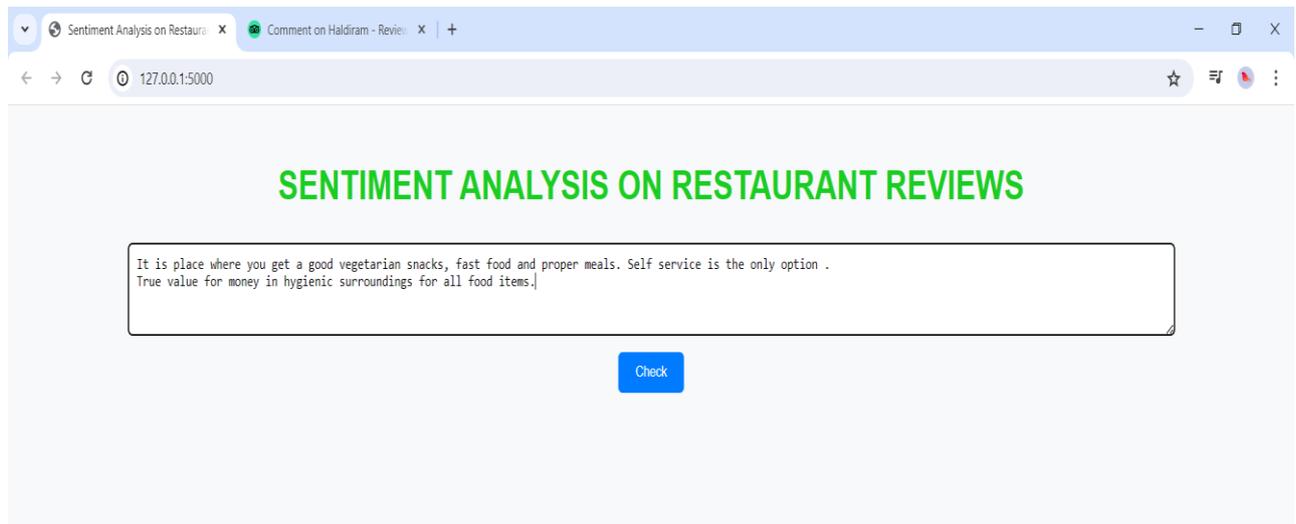


Fig 4.: Website Interface

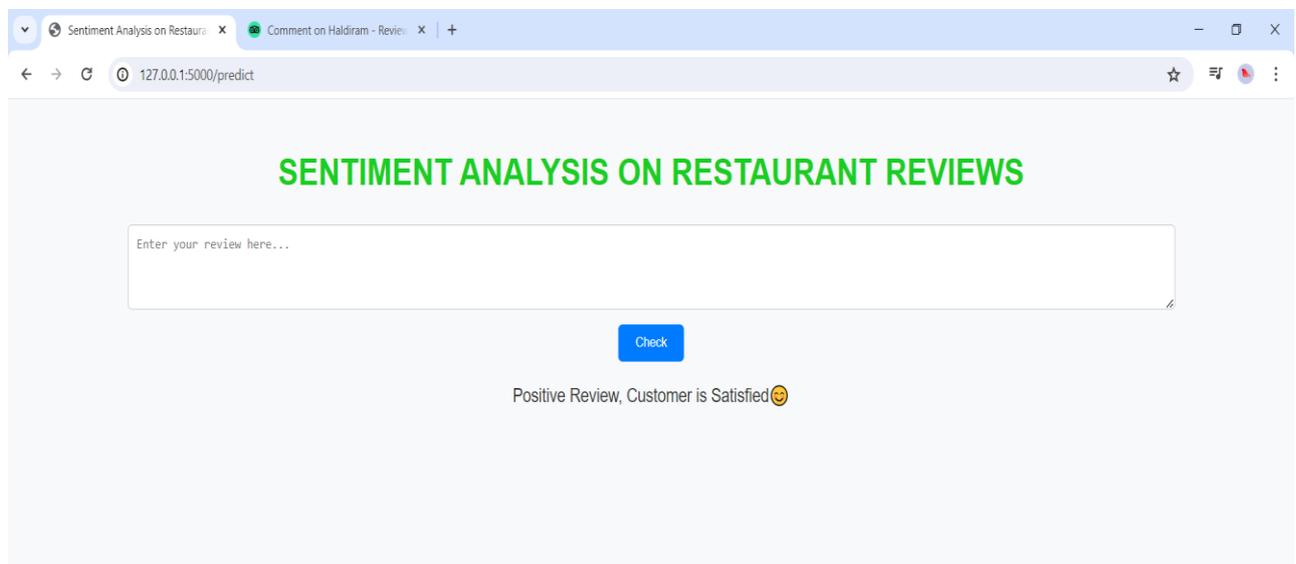


Fig 5: Website Interface

V. CONCLUSION

In conclusion, the sentiment analysis conducted on food reviews has provided valuable insights into the effectiveness of the sentiment analysis system in categorizing sentiments expressed in food-related content. Notably, the classification aspect involves the implementation of the naive Bayes algorithm, distinguishing sentiments as positive, negative. This project presents a system to analyze food reviews and determine the sentiment expressed. The system serves as a powerful tool for understanding customer opinions about food, offering valuable insights into customer preferences and satisfaction levels.

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