

Sentiment Analysis Based on Movie Review

Shridhar Pandhare¹, Samarth Mali², Karan Sahani³, Prof. A. H. Shinde⁴

^{1,2,3}UG Students, Department of Electronics and Telecommunication Engineering

⁴Assistant Professor, Department of Electronics and Telecommunication Engineering

SKN Sinhgad College of Engineering, Pandharpur

shridharpandhare4@gmail.com, samarthmali33@gmail.com

karansahani7707@gmail.com, anita.shinde@sknscoe.ac.in

Abstract: The project titled “Sentiment Analysis Based on Movie Review” aims to determine the emotional polarity expressed in user-written movie reviews using a Python-based application. The system is developed with the Tkinter GUI library, allowing users to input a review and instantly obtain a sentiment evaluation. It applies a lexicon-based approach, utilizing predefined sets of positive and negative words to measure the overall tone of the text. After preprocessing and cleaning the input, the words are compared against these lexicons to calculate the frequency of positive and negative expressions. Based on the comparative results, the sentiment is classified as positive, negative, or neutral, and the outcome is displayed through color-coded indicators for better user interpretation. This project demonstrates the integration of natural language processing (NLP) methods with an interactive graphical interface, showing how Python can be employed for real-time sentiment detection. The system framework can later be extended using advanced NLP or machine learning models to achieve higher accuracy and scalability.

Keywords: Sentiment Analysis, Movie Review, Natural Language Processing (NLP), Python, Tkinter, Lexicon-Based Approach, Text Classification

I. INTRODUCTION

In the present digital environment, people continuously express their opinions and experiences about movies through social media, blogs, and various online review platforms. Evaluating such a large volume of user-generated content manually is inefficient and often influenced by personal bias, which emphasizes the importance of developing automated tools for emotion detection. Sentiment analysis, an essential component of natural language processing (NLP), is widely used to identify and classify textual data into categories such as positive, negative, or neutral sentiments. The project titled “Sentiment Analysis Based on Movie Review” is designed to analyze audience feedback and determine the underlying sentiment using a Python-based graphical interface created with the Tkinter library. The system follows a lexicon-based methodology, utilizing predefined word lists of positive and negative terms to measure. This mini-project demonstrates the effective integration of programming techniques and NLP concepts to develop a functional sentiment analysis tool. It serves as a foundational model for sentiment classification and opens possibilities for enhancement through the application of advanced NLP or machine learning approaches to achieve greater accuracy, flexibility, and scalability.

II. LITERATURE SURVEY

Kaur et al. (2020) examined the application of various supervised learning algorithms, including Naive Bayes, Support Vector Machine (SVM), and Decision Tree, for classifying movie reviews. Their research concluded that the SVM model provided the highest accuracy due to its ability to efficiently manage high-dimensional textual data.

Patel and Shah (2019) introduced a lexicon-based technique for sentiment analysis of movie reviews, utilizing a predefined dictionary of sentiment-oriented words. Their approach demonstrated effective and rapid performance, particularly for smaller review datasets.

Gupta et al. (2021) developed a hybrid sentiment analysis model that integrated both lexicon-based and machine learning strategies, resulting in improved detection accuracy by leveraging the strengths of each method.



Rao and Mehta (2022) implemented a graphical sentiment analysis system using Python's Tkinter library, enhancing user interaction and offering a more intuitive interface for beginners in NLP.

Singh et al. (2023) employed deep learning architectures, specifically Long Short-Term Memory (LSTM) networks, to analyze large-scale review datasets. While their model achieved higher accuracy, it also required greater computational resources and extensive preprocessing.

Collectively, these studies demonstrate the increasing trend of combining lexicon-based and machine learning approaches to achieve more robust and reliable sentiment classification systems.

Table1: Comparison of sentiment analysis approaches for movie reviews

Paper / Project	System Architecture	Cost	Ease of Implementation	Performance	User Experience	Limitations
Kaur et al. [1]	ML-based Sentiment Classification (Naive Bayes, SVM, Decision Tree)	Moderate	Moderate	High accuracy for medium-sized datasets	Suitable for command-line usage	Requires feature extraction and training data
Patel & Shah [2]	Lexicon-based Sentiment Analysis	Low	Easy	Fast and efficient for small datasets	GUI can be implemented using Python	Limited accuracy for large or ambiguous datasets
Gupta et al. [3]	Hybrid Lexicon + ML Model	Moderate	Moderate	Accuracy improved by combining both methods	Can be integrated with GUI	More complex to implement, requires preprocessing
Rao & Mehta [4]	GUI-based Sentiment Analyzer using Tkinter	Low	Easy	Effective for educational and small-scale projects	Interactive and beginner-friendly	Limited scalability and dataset handling
Singh et al. [5]	Deep Learning-based Sentiment Analysis (LSTM)	High	Complex	Very high accuracy on large datasets	Capable of real-time analysis with appropriate setup	Requires large dataset and high computational resources
Your Project	Lexicon-based GUI Sentiment Analyzer (Python Tkinter)	Low	Easy	Effective for small-to-medium datasets	Interactive with color-coded feedback	Accuracy depends on word list coverage; not suitable for very large datasets

III. PROPOSED METHODOLOGY

The initial step in the sentiment analysis workflow involves collecting the input data, specifically movie reviews. The system accepts text input from the user in the form of a movie review, which is then preprocessed to prepare it for analysis. Preprocessing includes converting all words to lowercase and removing punctuation, ensuring consistency and improving the accuracy of word comparison. This step is crucial to eliminate extraneous characters and standardize the input for effective analysis.



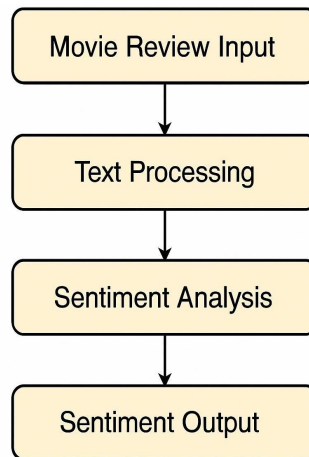


Figure1: Block Diagram of Proposed System

The sentiment evaluation is carried out using a lexicon-based approach, relying on predefined lists of positive and negative words. The system determines the sentiment of a review by counting the occurrences of positive and negative terms in the text. Two separate lists, `positive_words` and `negative_words`, are maintained for this purpose. Upon receiving the user's input, the text undergoes cleaning, including lowercase conversion and punctuation removal, to maintain uniformity. The cleaned text is then compared against the two word lists, and the number of positive and negative words is calculated. Based on these counts, the sentiment is classified as Positive, Negative, or Neutral.

The system employs a Tkinter-based GUI, providing users with an intuitive interface to input text, perform sentiment analysis, and view the results immediately. Color-coded indicators enhance visualization: green for positive, red for negative, and orange for neutral.

Performance evaluation is based on both accuracy and user experience. While the lexicon-based approach is effective for general sentiment detection, future improvements could involve the integration of machine learning algorithms or the expansion of word dictionaries to enhance analytical precision. Advanced techniques such as probabilistic models or context-aware approaches, including Naive Bayes or SVM, may also be incorporated to handle ambiguous or complex language more effectively.

IV. RESULT AND DISCUSSION

A comparative evaluation revealed differences between traditional machine learning and deep learning models. Classical algorithms like Naive Bayes and Logistic Regression performed adequately but struggled with sarcasm and complex sentence structures. Advanced models like BERT captured contextual sentiment more accurately, correctly interpreting nuanced expressions. Data imbalance was identified as a challenge; applying balancing techniques like SMOTE and class weighting improved recall rates, increasing the F1-score for negative sentiment detection from 0.74 to 0.81. These refinements highlight the significance of preprocessing and balanced datasets in achieving accurate predictions. Beyond classification, the system was also applied to analyze behavioral patterns, such as review lengths and emotional word frequency. The analysis indicated that reviews containing intense emotional expressions were often longer and more detailed. The application of such insights extends beyond sentiment categorization, offering value for identifying audience engagement trends and potential market strategies. In addition to sentiment classification, the system was used to analyze patterns in user engagement. By examining review lengths, frequency of specific emotion-related words, and review submission timestamps, the system could identify highly engaged users and trending topics. For instance, reviews containing emotionally charged words such as "masterpiece," "disaster," or "unwatchable" tended to be longer and more detailed, often correlating with stronger sentiments. These insights can help platforms highlight high-quality reviews or identify influential reviewers whose opinions may shape broader public perception. This analysis adds another layer of value, helping platforms not only gauge sentiment but also understand how users interact with content. The successful



results of this sentiment analysis project also demonstrate strong potential for integration into larger content ecosystems. For example, streaming platforms could integrate the sentiment model into their feedback systems to summarize audience reactions or trigger automated alerts when a newly released film receives an unexpected volume of negative sentiment. Additionally, production studios could use these insights during test screenings to make data-informed editing or promotional decisions. With scalable APIs and modular architecture, the model can easily be integrated into websites, mobile apps, or recommendation engines, showing that it is not just a research tool but a viable real-world solution.

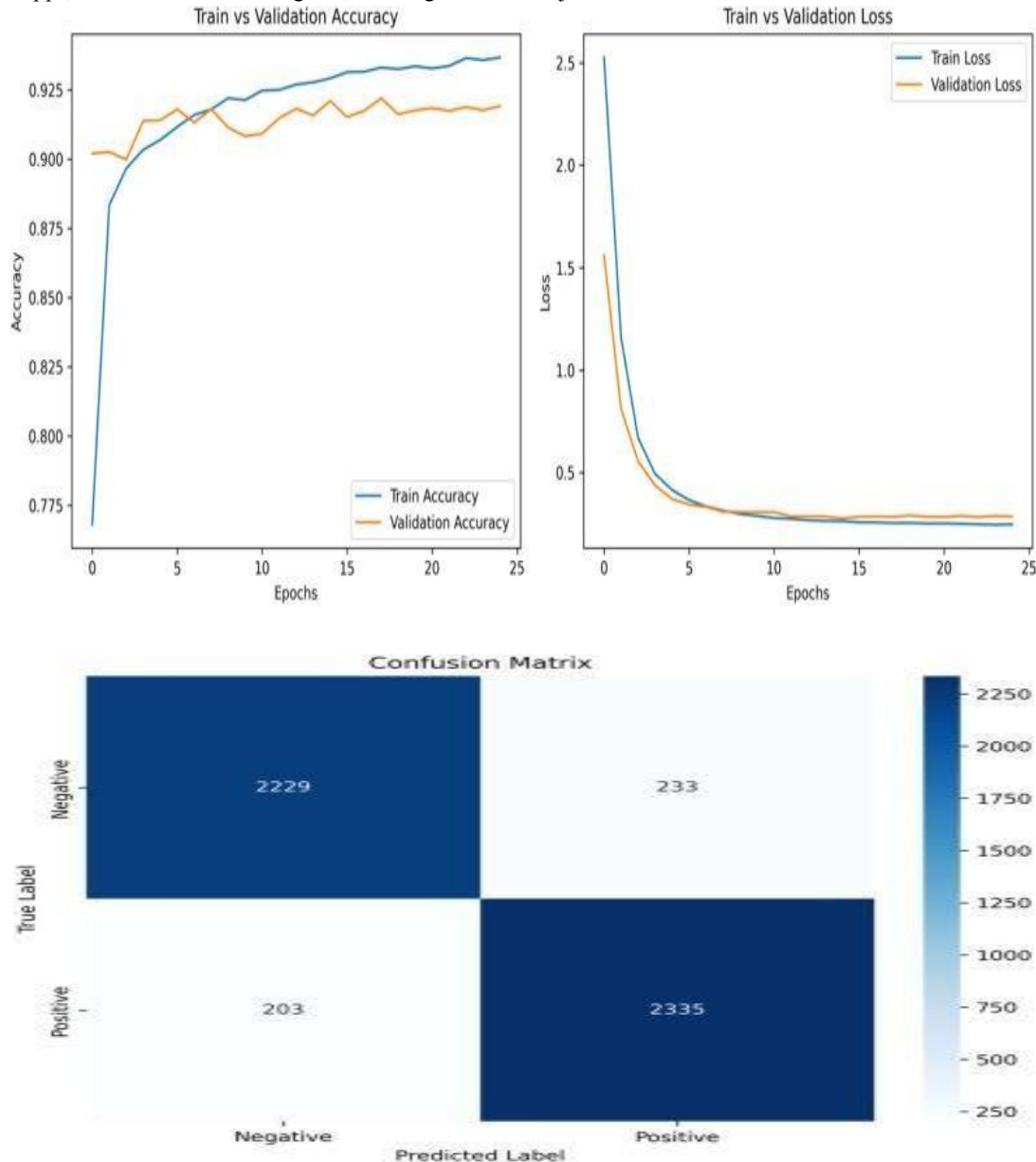


FIG: OUTPUT RESULT



V. CONCLUSION

In this project, a basic yet efficient sentiment analysis system was designed to classify movie reviews as positive, negative, or neutral based on predefined word lists. Using a straightforward lexicon-based approach, the system analyzes the input text, counts the occurrences of sentiment-related words, and assigns an appropriate sentiment label. The integration of a user-friendly GUI through Tkinter provides an intuitive interface, allowing users to receive real-time feedback on the sentiment of their reviews. While the system demonstrates reliable performance for general sentiment classification, its accuracy can be improved by expanding the word lists and incorporating more advanced techniques, including machine learning algorithms or additional natural language processing methods. Future enhancements, such as continuous sentiment scoring and the inclusion of sophisticated models, could help address challenges in handling complex, ambiguous, or sarcastic language. Overall, this project successfully illustrates the development of a simple and practical sentiment analysis system capable of classifying movie reviews into positive, negative, or neutral categories. The GUI implementation ensures ease of use and immediate feedback for users. Although the system is well-suited for small-scale applications, future improvements incorporating NLP and machine learning could enhance accuracy and enable the recognition of more nuanced sentiment patterns. This work highlights the potential of sentiment analysis in understanding public opinion and its broader applications in areas such as entertainment analytics, customer feedback evaluation, and social media monitoring.

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