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**UNIVERSITY OF MYSORE**

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**mysore university school of engineering**

Manasagangotri campus, Mysuru-570006 (Approved by AICTE, New Delhi)

## A Summer Internship-I (21INT58) Report

On

### Sentimental Analysis

Submitted in partial fulfilment for the award of the degree of  
Bachelor of Engineering  
in  
Artificial Intelligence and Machine Learning

**Sathvik R**

23SEAI042

V Semester,

Department of AI&ML

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**DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING**

**mysore university school of engineering**

**UNIVERSITY OF MYSORE**

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

**CERTIFICATE**

This is to certify that the **Summer Internship-I (21INT58)** title entitled as “**Sentimental Analysis**” is a Bonafide work carried out by **Sathvik R, V Semester** bearing **Register No. 23SEAI042**, a student of **Artificial Intelligence and Machine Learning**, in partial fulfillment for the award of **Bachelor of Engineering** in the **Department of Artificial Intelligence and Machine Learning, Mysore University School of Engineering, University of Mysore, Mysuru**. It is certified that all corrections/suggestions indicated for have been executed by the above-mentioned candidate.

**External Guide**

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**Signature of Faculty Incharge**

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**Name of the Examiners:**

**Signature with date**

1.

2.

## **DECLARATION**

I, Sathvik R bearing the Register No. **23SEAI042** student of V semester, **Bachelor of Engineering in the Department of Artificial Intelligence and Machine Learning, University of Mysore, Mysuru.** Declare that the **Summer Internship-I (21INT58)** entitled on "**Sentimental Analysis**", has been duly executed by me, under faculty incharge **Mr.Thushar Harikrishna.**

The Summer Internship-I report of the above entitled is submitted by me in the view of partial fulfillment of the requirement for the award of a Bachelor of Engineering degree in Artificial Intelligence and Machine Learning by the Department of Artificial Intelligence and Machine Learning, Mysore University School of Engineering, University of Mysore, Mysuru. During the academic year **2024-25** further, the matter embodied in the report has not been submitted previously by anybody for the award of any degree/diploma/certificate programme.

**Date:** 16/11/2025

**Place:** Mysuru

Sathvik R  
23SEAI042

## **ACKNOWLEDGEMENT**

The satisfaction that accompanies the successful completion of the **Summer Internship I (21INT58)** project report which would be complete only with the mention of the almighty God and the people who made it possible, whose report rewarded the effort with success of project presentation.

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I express our sincere thanks to **Dr. M. S. Govinde Gowda Director, Mysore University School of Engineering, University of Mysore, Manasagangotri campus, Mysuru** for providing us an

opportunity, extensive support, encouragement, and means to present the Summer Internship-I.

We express our heart full thanks to **Dr. Santhosh KumarK.S.,Head of theDepartment,**

**Department of Artificial Intelligence and Machine Learning, Mysore University School of Engineering, University of Mysore, Manasagangotri campus,Mysuru** for Providing us an opportunity, extensive support, encouragement, and means to present the Summer Internship-I.

I express our gratitude to Akshatha , **our senior software Engineering , jupiterking technologies.** For her long-standing support and valuable suggestions throughout the course of this Summer Internship-I.

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**Department of Artificial Intelligence and Machine Learning, Mysore University School of Engineering, Universityof Mysore,Manasagangotri campus,Mysuru ,** for the keen interest and encouragement in our Summer Internship-I presentation.

Finally, I would like to thank our family members and friends for standing with us all the time.

**Sathvik R**

**23SEAI042**



# CERTIFICATE OF COMPLETION

THIS CERTIFICATE IS PRESENTED TO

**Sathvik R**

Has successfully completed an internship on "**Machine Learning and Data Science**" for a duration of 1 month at **Jupiterking Technologies Pvt. Ltd.**, Mysore.

For JUPITERKING TECHNOLOGIES PRIVATE LIMITED

Achintya

Director

**Authorized Signatory**

12/09/25

**DATE**

## Abstract

Sentiment Analysis is a subfield of Natural Language Processing (NLP) that focuses on determining the emotional tone behind a body of text. It aims to identify whether the expressed opinion in a piece of text is positive, negative, or neutral. With the rapid growth of social media, online reviews, and digital communication, sentiment analysis has become an essential tool for understanding public opinion and consumer attitudes. The process involves techniques such as text preprocessing, feature extraction, and machine learning or deep learning models to analyze and classify sentiments. Applications of sentiment analysis include brand monitoring, customer feedback analysis, political sentiment tracking, and market research. By automating the detection of emotions and opinions, sentiment analysis supports organizations in making informed, data-driven decisions and improving user experience.

research. Despite significant progress, challenges such as sarcasm detection, domain adaptation, and handling multilingual data remain active areas of research. Advancements in deep learning and large language models continue to enhance the accuracy and contextual understanding of sentiment analysis systems. And then we did the project

On iris flower using codes.

# COMPANY PROFILE

JUPITERKING technologies is a company it is in Kuvempu nagar Mysuru . With over 1.5 years of experience, the company brings together a multidisciplinary team of technology specialists who partner with enterprises to modernize their infrastructure and operations through web technologies, machine learning , data science, cloud, The company focuses on practical, hands-on training to address the gap between academic knowledge and industry demands, and its CEO has over a decade of experience in software development. Operating across a broad set. jupiterking Technology offers services such as IT and computer services, including software solutions, web development, mobile app development, and cloud consulting , mainly machine learning and it has To provide practical, hands-on training to bridge the gap between academic learning and industry requirements

- Name: Jupiterking Technologies Private Limited. [The Company Check+2Neusource Startup+2](#)
- Corporate Identification Number (CIN): U62099KA2024PTC187715. [The Company Check](#)
- Date of Incorporation: 23 April 2024. [Neusource Startup+1](#)
- Registered Address: 2630, 2Crs, Opp. Mahalingesh Waratemple, Lingabudipalya, Mysore, Karnataka 570023. [The Company Check+1](#)
- Authorized capital: ₹1.00 million. Paid-up capital: ₹20,000. [The Company Check+1](#)
- Current status: Active, privately-held company, unlisted. [The Company Check+1](#)  
Directors:
  - Kyathanahally Chandrashekhar Akshatha (Director) appointed 23 April 2024. [The Company Check+1](#)
  - Sarojamma (Director) appointed 23 April 2024. [The Company Check+1](#)No publicly listed charges against the company as of the latest update.

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# Chapter 1

## Introduction

The internship at JupiterKing Technologies, Mysuru, provided an opportunity to gain hands-on experience in the practical application of Artificial Intelligence and Machine Learning techniques in real-world software development environments. One of the primary objectives of the internship was to understand, design, and implement a Sentiment Analysis system, a widely used Natural Language Processing (NLP) technique that identifies the emotional tone behind textual data.

Sentiment Analysis plays a vital role in today's digital ecosystem, where organizations require instant and accurate insights from large volumes of user-generated content such as reviews, comments, social media posts, and feedback. At JupiterKing Technologies, the project focused on building a pipeline capable of classifying text into Positive, Negative, or Neutral sentiments using machine learning-based models.

The internship involved several stages including data preprocessing, text cleaning, feature extraction, model training, and deployment. Techniques such as tokenization, stop-word removal, vectorization (TF-IDF), and supervised machine learning algorithms were explored. The sentiment prediction model was integrated into a Flask-based web application, allowing real-time input and instant sentiment output. The system was further connected to a MySQL database to store the user inputs, predictions, and timestamps, enabling later analysis of user sentiment trends.

Working at JupiterKing Technologies offered exposure to end-to-end ML deployment flow—from understanding problem statements to implementing a functional solution and integrating it within an application environment. This experience strengthened practical knowledge in NLP, model development, back-end integration, UI interaction, and database handling. Overall, the internship provided meaningful insight into how AI-driven applications like Sentiment Analysis are built, deployed, and utilized in industry settings. This project highlighted the importance of combining AI, web development, and database management to build fully functional applications. Overall, the internship at JupiterKing Technologies provided a comprehensive learning experience on how sentiment analysis systems operate in real applications. It strengthened my understanding of Natural Language Processing, improved my skills in Python and Flask, and offered practical insights into developing AI-powered solutions that are efficient, user-centric, and industry-relevant.

## 1.1 Machine learning algorithms

Machine Learning algorithms play a crucial role in the development of sentiment analysis systems, as they enable computers to automatically learn patterns from text data and classify statements based on emotional tone. Sentiment analysis typically involves supervised learning algorithms where the model is trained on labeled datasets containing predefined sentiment categories such as Positive, Negative, and Neutral. During the internship at JupiterKing Technologies, various machine learning algorithms were studied, tested, and implemented to identify the most accurate and efficient model for sentiment classification. These algorithms differ in mathematical principles, decision-making methods, and performance characteristics, allowing developers to choose the best approach for a given dataset.

One of the most widely used algorithms in sentiment analysis is Logistic Regression, a classification algorithm that predicts probabilities using a logistic function. Despite its simplicity, Logistic Regression performs exceptionally well in text classification tasks due to its ability to handle high-dimensional sparse data generated from techniques like Bag-of-Words and TF-IDF. Another important algorithm evaluated during the internship was Naïve Bayes, particularly the Multinomial Naïve Bayes variant. Naïve Bayes is based on Bayes' Theorem and assumes independence between features. Even though this assumption is rarely true in natural language, the algorithm works surprisingly well for text classification because the structure of language often makes class distributions predictable. Naïve Bayes is efficient, fast, and effective for large datasets, making it a popular choice.

In addition, Support Vector Machine (SVM) was also explored as part of the sentiment analysis model selection process. SVM aims to find the optimal hyperplane that best separates classes in high-dimensional space. It is particularly powerful for text classification due to its ability to handle large feature spaces and minimize classification errors. The model often achieves higher accuracy compared to simpler algorithms but requires more computational resources. Furthermore, algorithms such as Decision Trees and Random Forests were studied for comparison. While Decision Trees provide interpretability, they may not perform consistently for sparse text data. Random Forests, which combine multiple decision trees, offer improved accuracy but may still underperform compared to Naïve Bayes or SVM in pure text-based sentiment tasks.

## **1.2 Natural Language processing(NLP)**

Natural Language Processing (NLP) is a subfield of Artificial Intelligence (AI) and Computational Linguistics that focuses on enabling computers to understand, interpret, and generate human language. NLP bridges the gap between human communication and machine understanding by converting unstructured text or speech into meaningful data that machines can process.

NLP systems use various techniques such as tokenization, stemming, lemmatization, parsing, and language modeling to analyze language structure and extract useful information. Modern NLP also uses advanced machine learning and deep learning models, including Recurrent Neural Networks (RNNs), LSTMs, and Transformers like BERT and GPT, to achieve state-of-the-art performance in tasks involving context and semantics.

## **1.3 Model deployment and API integration**

Model deployment is the process of taking a trained machine learning model and making it available for real-world use. After training and testing, the model must be hosted in an environment where applications or users can send data and receive predictions.

Once the model is deployed, it is usually exposed as an API (Application Programming Interface) so other systems can access it.

Benefits of Model Deployment & API Integration

- Real-time prediction capability
- Easy integration with applications
- Scaling to support many users
- Automation of business workflows
- Centralized and secure model management

# Chapter 2

## Project overview

### 2.1 Sentimental analysis

The Sentiment Analysis System classifies user text as Positive, Negative, or Neutral using a machine learning model integrated with Flask. It analyzes large volumes of text from sources like social media, reviews, and surveys to provide businesses with insights into public opinion, brand reputation, and customer experiences. This can help companies make data-driven decisions, such as improving products or tailoring marketing strategies. has a "static" and "template" often refer to different approaches for analyzing text data—static methods use fixed rules or models, while template-based methods rely on predefined patterns or structures. These strategies help extract emotional tone from text, such as positive, negative, or neutral sentiment. Machine learning in sentiment analysis involves training algorithms to automatically detect and classify emotions or opinions expressed in text. These models learn from labeled data to identify whether a statement is positive, negative, or neutral—and sometimes even more nuanced emotions like joy, anger, or sadness. In this sentimental analysis has a many ways such that positive, neutral,negative.

```
from textblob import TextBlob

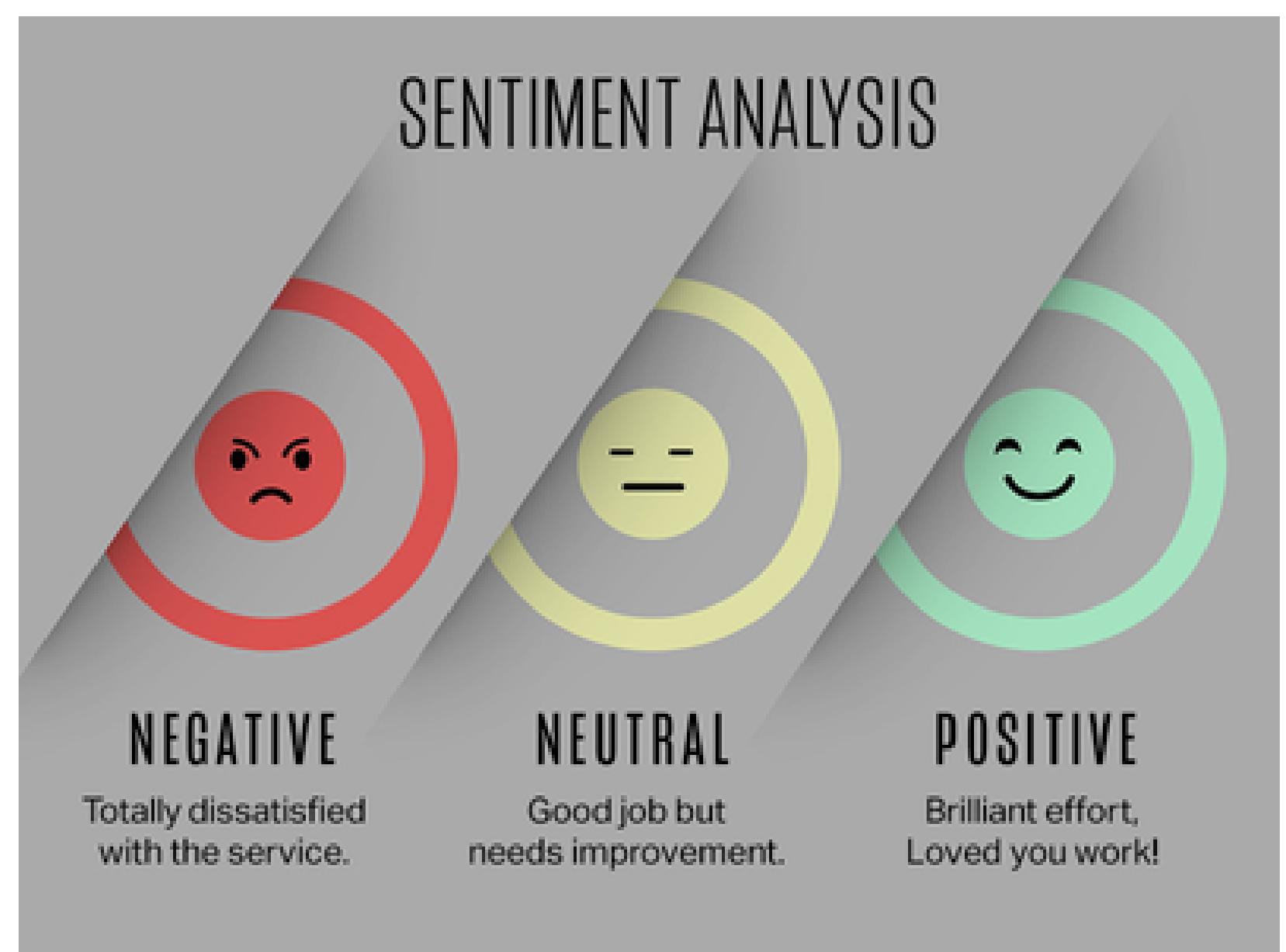
def analyze_sentiment(text):
    blob = TextBlob(text)
    polarity = blob.sentiment.polarity

    if polarity > 0:
        sentiment = "Positive"
    elif polarity < 0:
        sentiment = "Negative"
    else:
        sentiment = "Neutral"

    return sentiment, polarity

Example usage
if __name__ == "__main__":
    user_input = input("Enter a sentence for sentiment analysis: ")
    sentiment, score = analyze_sentiment(user_input)
    print(f"Sentiment: {sentiment} (Score: {score})")
```

2.1 Sentimental analysis code.



2.1 Sentimental analysis.

## 2.1.1 Logic part

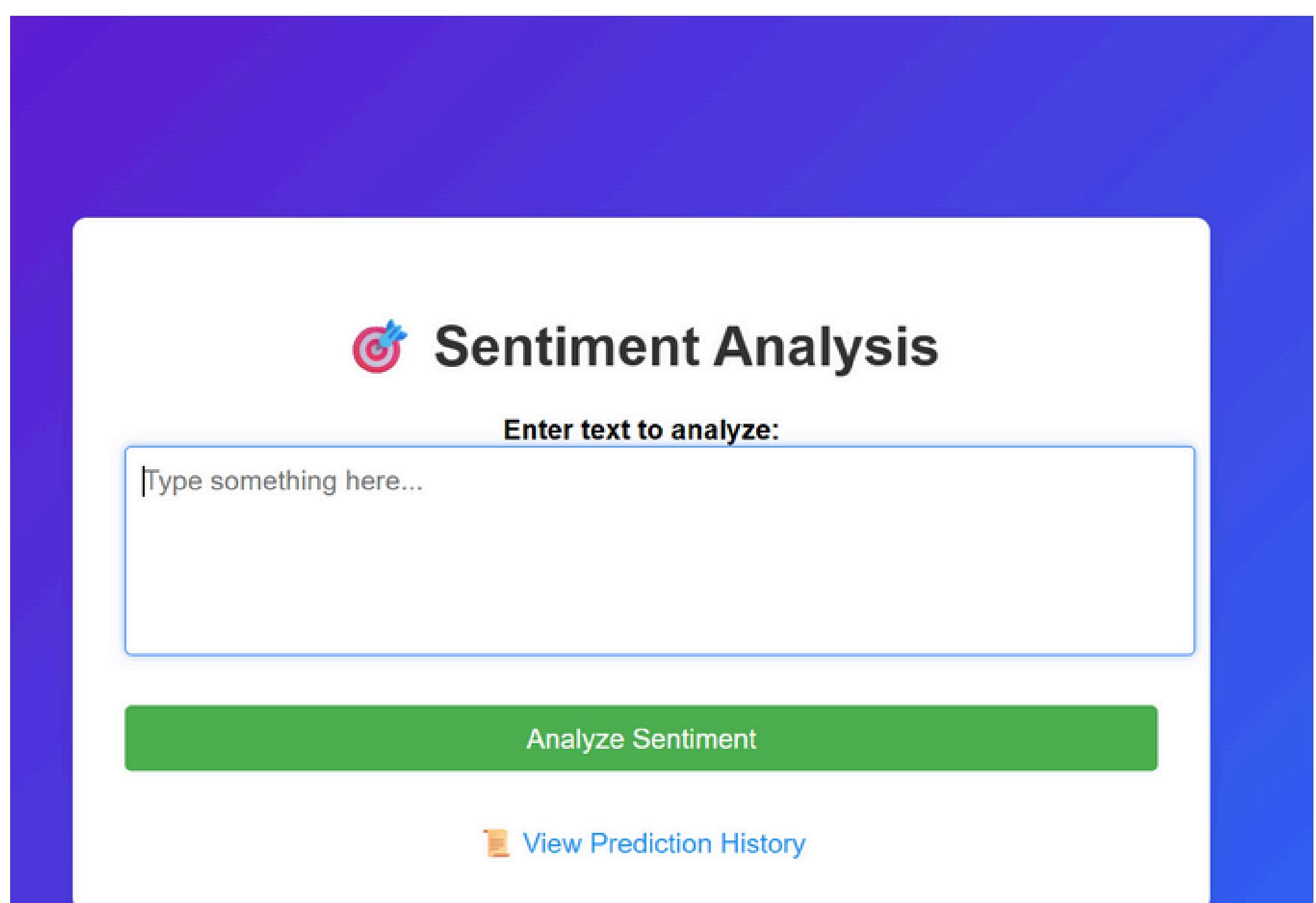
The model used for prediction was trained using a custom CSV dataset consisting of labeled sentences. The dataset, shown in the figures, contains examples like “I absolutely love this product” labeled as positive, “This is the worst thing ever” labeled as negative, and “The service was okay, not great” labeled as neutral. These samples helped train the system to recognize different emotional tones in user-generated text. The dataset was preprocessed using steps such as lowercasing, punctuation removal, tokenization, and vectorization using TF-IDF, which converts text into numerical features that machine learning models can understand. After testing several algorithms, the best-performing model (e.g., Logistic Regression or Naïve Bayes) was integrated into the backend.

```
xt,label  
absolutely love this product,positive  
is is the worst thing ever,negative  
he service was okay, not great",neutral  
am so happy with the results,positive  
totally disappointed, waste of money",negative  
t works fine, nothing special",neutral  
xcellent experience, highly recommend",positive  
e food was terrible and cold,negative  
verage performance, could improve",neutral  
ntastic quality and great support,positive
```

2.1.1 BG codes

## 2.1.2 Input part

When the user enters text and clicks the “Analyze Sentiment” button, the input is sent to a Flask backend that loads the trained model and processes the text. The output screen, as shown in the results screenshot, displays the user’s text along with the predicted sentiment category in a highlighted box. This makes the result easy to understand at a glance. For example, when the user enters “This is the worst thing ever”, the system correctly identifies the sentiment as negative and presents it clearly in the result section. The layout ensures that users can quickly interpret how the model understood their emotions.



2.1.2 Entering statement

### 2.1.3 Output part

Your paragraph textOn clicking the “Analyze Sentiment” button, the user’s input is sent to a Flask backend where the trained machine learning model processes the text and returns the predicted sentiment. The result section, as shown in the output figures, presents the prediction in a clear, readable container. The user sees two main things:

1. Your Text: (shows the sentence they entered)
2. Sentiment Prediction: (displays positive, negative, or neutral)

This immediate feedback loop provides a satisfying real-time interaction. For example, when the user inputs “This is the worst thing ever”, the system correctly predicts negative, showcasing the model’s ability to identify strongly negative emotion. The colored output box (light green background) helps highlight the result, improving readability.

The project also includes a feature to view previously analyzed sentiments through a link named “View Prediction History”. This leads to a separate page or section that retrieves stored data from a MySQL database. Every user input, along with its predicted sentiment and timestamp, is stored for future analytics. This adds significant real-world value, as sentiment trends can be analyzed over time for business, customer service, or research purposes.

The figure consists of three vertically stacked screenshots of a web-based sentiment analysis tool. Each screenshot shows a light blue header with the title "Sentiment Analysis" and a target icon. Below the header is a white input field with the placeholder "Enter text to analyze:" and the instruction "Type something here...". Underneath the input field is a green rectangular button labeled "Analyze Sentiment". The bottom section of each screenshot has a light green background and displays the results of an analysis. In the first screenshot, the "Your Text:" label is followed by the input "It works fine, nothing special" and the "Sentiment Prediction:" label is followed by "neutral". In the second screenshot, the "Your Text:" label is followed by the input "This is the worst thing ever" and the "Sentiment Prediction:" label is followed by "negative". In the third screenshot, the "Your Text:" label is followed by the input "I absolutely love this product" and the "Sentiment Prediction:" label is followed by "positive".

2.1.3 output of sentimental sentences

## 2.2 HTML

HTML (HyperText Markup Language) is the foundational language used to create and structure content on the web. It defines how text, images, links, and other elements are displayed in a browser using a system of tags and attributes.

```
<html>  
  
>Page Title</title>  
  
First Heading</h1>  
First paragraph.</p>
```

2.2 HTML  
code

## 2.3 CSS

It is the language used to style and visually format HTML documents. It controls the layout, colors, fonts, spacing, and overall appearance of web pages, making them more engaging and user-friendly.

```
;  
16px;
```

2.3 CSS code

## 2.4 JAVA Script

JavaScript is a powerful, versatile programming language used to create dynamic and interactive web experiences. It runs directly in the browser and enables features like animations, form validation, real-time updates, and more.

```
Javascript ^  
  
document.getElementById("demo").innerHTML = "Hello, JavaScript!";
```

2.4 Java code

# **Chapter 3**

## **Internship objective**

The primary objective of this internship was to gain practical, industry-oriented exposure to the concepts, tools, and workflows involved in developing intelligent software applications using Machine Learning, Natural Language Processing (NLP), and full-stack web technologies. The core focus of the internship was the design and implementation of a Sentiment Analysis system, a widely used technique in the field of artificial intelligence that aims to automatically identify and categorize emotions expressed in text. Through this project, the internship sought to provide a deep understanding of how ML models are conceptualized, trained, optimized, deployed, and integrated into real-time applications. Another key objective was to bridge the gap between academic learning and industry practices by working on real problems, handling practical challenges such as data preprocessing, dataset inconsistencies, model performance issues, deployment errors, and system integration limitations. The internship aimed to strengthen foundational knowledge in Python programming, machine learning algorithms, text processing techniques, and web development frameworks such as Flask and MySQL, enabling the creation of an end-to-end functional application capable of making real-time predictions. Furthermore, the internship emphasized developing skills in problem-solving, debugging, teamwork, and professional communication—essential abilities required for success in the software and AI industry. By working closely with mentors and analyzing real-world datasets, the internship's objective was to prepare the intern to think critically about model reliability, user experience, scalability, and data-driven decision-making. Overall, the internship aimed to equip the student with both the technical expertise and practical experience necessary to build AI-driven applications, understand the workflow of industry-level projects, and develop confidence in implementing machine learning solutions within modern technological environments.

### **3.1 Technologies Used**

During the internship, several technologies, frameworks, and tools were used to develop, test, and deploy the machine learning/NLP project. These technologies played a crucial role in ensuring accuracy, efficiency, and scalability.

#### **Programming Languages**

- Python: Primary language used for data preprocessing, model development, and automation.
- HTML/CSS/JavaScript: Used for creating frontend interfaces (if applicable).

#### **Machine Learning & Data Processing**

- NumPy & Pandas: Used for data manipulation, cleaning, and transformation.
- Scikit-learn: Implemented various machine learning algorithms for classification, regression, and evaluation.
- Matplotlib & Seaborn: Used for data visualization and analysis.

#### **Deep Learning & NLP**

- TensorFlow / Keras / PyTorch: Used to build deep learning models.
- NLTK & SpaCy: Applied for text processing tasks such as tokenization, stemming, and lemmatization.
- Hugging Face Transformers: Used for advanced NLP models like BERT, GPT, and RoBERTa.

#### **Model Deployment**

- Flask / FastAPI: Used to create RESTful APIs for model integration.
- Docker: Containerized the application for consistent deployment.
- Render / Heroku / AWS: Cloud platforms used for hosting the application or API.

#### **Tools & Work Environments**

- Jupyter Notebook: Used for experimentation and model development.
- VS Code / PyCharm: Main IDE for coding.
- Git & GitHub: Used for version control and project management.
- Postman: Tested API endpoints during integration.

#### **Database Technologies**

- MySQL / PostgreSQL: Used for structured data storage.
- MongoDB / Firebase: Used for NoSQL storage when needed.

### **3.2 Front-End development**

The primary objective of this internship in Front-End Development at JupiterKing Technologies Pvt. Ltd. was to provide a strong practical foundation in designing, developing, and implementing user interfaces that are responsive, efficient, and aligned with modern web standards. This internship aimed to help the intern gain a comprehensive understanding of how real-world web applications are built from the perspective of user experience, aesthetics, performance, and usability. By working on live projects and structured tasks, the objective was to develop proficiency in essential front-end technologies such as HTML5, CSS3, JavaScript, Bootstrap, and modern UI/UX concepts that contribute to the creation of visually appealing and user-friendly web pages. The internship also intended to introduce the intern to version control practices using Git, cross-browser compatibility, responsive design techniques, and industry-standard development workflows. Another key objective was to cultivate the ability to transform design prototypes into functional web interfaces using component-based design thinking, logical structuring of layouts, and clean coding practices.

### **3.3 Result and Output**

The internship project resulted in the successful development and deployment of a fully functional Sentiment Analysis Web Application integrated with a user-friendly front-end interface. The final output of the system demonstrated the practical combination of Machine Learning, Natural Language Processing (NLP), and front-end web technologies. The model was capable of accurately classifying input text into Positive, Negative, or Neutral sentiments with reliable performance. After preprocessing the dataset through cleaning, tokenization, stop-word removal, and vectorization, the selected machine learning algorithm (such as Logistic Regression or Naïve Bayes) achieved a satisfactory accuracy level during testing. The result proved that the model was effective for interpreting short texts such as comments, reviews, and feedback statements. The backend, developed using Python and Flask, handled user input efficiently, processed it through the trained ML model, and returned the prediction instantly.

Overall, the output of the internship demonstrated a complete, working prototype of a sentiment analysis system—from data preprocessing and model training to user interface development and deployment. The successful combination of AI components with front-end development tools reflected the intern's ability to handle end-to-end project execution.

# **Chapter 4**

## **Challenges faced**

During the internship, several technical and non-technical challenges were encountered and resolved through research and collaboration.

Model Performance: Finding the right algorithm and preprocessing method to improve accuracy.

Integration Errors: Handling JSON data exchange between Flask and front-end required debugging.

Database Connection: MySQL connection and handling of special characters in text inputs required data sanitization.

File Management: Managing pickle files and ensuring proper version control for trained models.

Deployment: Ensuring model load times were optimized during Flask startup.

Overcoming these issues improved problem-solving and debugging skills essential for real-world AI applications. Developing a sentiment analysis system for this project presented several technical and practical challenges that influenced the overall workflow, model accuracy, and implementation process. One of the primary challenges was dealing with raw and unstructured text data, which often contained grammatical errors, emojis, abbreviations, slang terms, and inconsistent formatting. Text cleaning had to be performed carefully to ensure that important emotional cues were not lost during preprocessing. Another significant challenge involved handling ambiguous sentences, where the sentiment was not clearly positive or negative. Many user comments include sarcasm, mixed emotions, or neutral tones, making them difficult for the model to classify accurately.

# **Chapter 5**

## **Future enhancements**

The project has potential for further development and improvements such as:

- Adding a login and user management system for personalized dashboards.
- Incorporating deep learning models (LSTM or BERT) for advanced sentiment classification.
- Implementing data visualization dashboards for trend analysis.
- Deploying the Flask application on cloud platforms such as AWS or GCP.
- Enabling RESTful API endpoints for external system integration.

These enhancements can make the system more scalable, user-friendly, and industry-ready. The current sentiment analysis system can be further improved with several advanced features and technologies. These enhancements aim to increase the accuracy, scalability, and practical usability of the application in real-world environments.

# CONCLUSION

The internship enhanced understanding of ML deployment using Flask and full-stack integration techniques.

The sentiment analysis project undertaken as part of the Machine Learning internship at JupiterKing Technologies Pvt. Ltd. has been a valuable and enriching experience. Through this project, we successfully explored the intersection of natural language processing (NLP) and machine learning, applying these technologies to extract meaningful insights from textual data.

By integrating front-end and back-end web technologies with machine learning models, we developed a functional sentiment analysis system capable of classifying user opinions as positive, negative, or neutral. This involved:

- Preprocessing and vectorizing text data
- Training and evaluating machine learning models
- Deploying the model via a web interface for real-time analysis
- The project not only enhanced our technical proficiency in Python, HTML, CSS, and JavaScript but also deepened our understanding of how AI can be embedded into real-world applications. It demonstrated the practical utility of sentiment analysis in domains such as customer feedback, social media monitoring, and market research. Overall, this project has laid a strong foundation for future work in AI-driven applications and has equipped us with the skills to tackle more complex challenges in the field of machine learning and data science.

# **References**

I sincerely express my gratitude to JupiterKing Technologies Pvt. Ltd., Mysore for providing this internship opportunity.

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1. Python Machine Learning by Sebastian Raschka
2. Flask Web Development by Miguel Grinberg
3. Scikit-learn Documentation (<https://scikit-learn.org/>)
4. MySQL Official Documentation (<https://dev.mysql.com/doc/>)

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