INTERNSHIP REPORT ON

"Flipkart Reviews Sentiment Analysis using Python"

Submitted By

Mr. Thorve Avishkar Shrikrushna

Roll No: 63

Exam No: T400840394

Class: TE AIDS

UNDER THE GUIDANCE OF

Prof. Jadhav. S.P.

Department of Artificial Intelligence and Data Science Engineering

Jaihind College of Engineering, Kuran

A/p- Kuran, Tal-Junnar, Dist-Pune-410511, State Maharashtra, India

2024-2025

Department of Artificial Intelligence and Data Science Engineering

Jaihind College of Engineering, Kuran

A/p- Kuran, Tal-Junnar, Dist-Pune-410511, State Maharashtra, India

2024-2025

CERTIFICATE

This is to certify that the Internship Report Entitled

"Flipkart Reviews Sentiment Analysis using Python"

SUBMITTED BY

Thorve Avishkar Shrikrushna

Is a bonafide work carried out by her under the supervision of **Prof. Jadhav. S.P.** and it is submitted towards the partial fulfillment of the requirement of Savitribai Phule Pune University, Pune for the award of the degree of TE (Artificial Intelligence and Data Science)

Prof. S. P. Jadhav
(Internship Co-Ordinator)

Prof. S. K. Said
(HOD AI&DS)

Dr. D. J. Garkal

(Principal)

(JCOE, Kuran.)

Certificate By Guide

This is to certify that **Mr. Thorve Avishkar Shrikrushna**, has completed the Internship work under my guidance and supervision and that, I have verified the work for its originality in documentation, problem statement in the INTERNSHIP. Any reproduction of other necessary work is with the prior permission and has given due ownership and included in the references.

Place: Kuran **Prof. S. P. Jadhav**

Date: (Internship Guide)

Acknowledgement

First, I would like to thank **Mr. Swapneel Petkar**, HR, Head, of Wisdom Sprouts Pvt.Ltd, Pune for giving me the opportunity to do an internship within the organization. I also would like all the people that worked along with Wisdom Sprouts Pvt. Ltd, Pune with their patience and openness they created an enjoyable working environment. It is indeed with a great sense of pleasure and immense sense of gratitude that I acknowledge the help of these individuals. I am highly indebted to our HOD **Prof. S. K. Said** and Principal **Dr. D. J. Garkal,** for the facilities provided to accomplish this internship. I would like to thank **Prof. S. P. Jadhav**, for their support and advices to get and complete internship in above said organization. I am extremely great full to my department staff members and friends who helped me in successful completion of this internship.

Yours Faithfully,

Mr. Thorve Avishkar Shrikrushna

Abstract

This project focuses on sentiment analysis of Flipkart product reviews using Python. By leveraging Natural Language Processing (NLP) techniques, we preprocess customer feedback, analyze sentiments (positive, negative, or neutral), and visualize insights to understand user satisfaction. The results help businesses and consumers make data-driven decisions based on review trends.

INTERNSHIP OFFER LETTER

scaleFULL

Partner in your digital transformation

Date: 19 Dec 2024

Dear Avishkar Shrikrushna Thorve,

We are pleased to offer you the position of **Intern Software Engineer** in our esteemed organisation starting from 20 Dec 2024 for a duration of 45 Days under the company's Corporate-Academic policies. During this period, you will be trained under and associated with the Development team of the company.

As an Intern, you agree to:

1. Maintain the Company's code of conduct.
2. Attend all training sessions on time without fail.
3. Weekly complete at least 40 official working hours on weekdays.
4. Take no holidays.
5. Complete all Tasks assigned to you on time to the proper standards as laid down by the Company.
6. Maintain the integrity and security of any information, data or material that you may get in contact with during your internship period.
7. Not being associated with any other company by either means of profit or non-profit terms.
8. The company rights of terminating you without any prior notice if you are found guilty of violating any of the points mentioned above and/or anything else that may affect the company's environment in an adverse way.

As an Intern, you will not be liable for any of the other facilities that the permanent employees of the Company may enjoy. We are happy to see you on board and hope you will turn out to be a useful resource for the company during your tenure with us.

We wish you luck in your journey with Scalefull Technologies!!

Swapneel Petkar
Director
Scalefull Technologies

COMPANY PROFILE

Overview of the Company:

ScaleFull Technologies LLP is a Pune-based IT consultancy and software development firm established in December 2018. The company specializes in delivering tailored digital solutions that drive business growth, focusing on website development, web application design, e-commerce platforms, and mobile application development. ScaleFull Technologies is known for creating visually appealing, user-friendly, and responsive websites that engage target audiences, as well as for building robust and scalable web applications that help automate tasks and streamline business operations. Their expertise extends to developing secure, feature-rich e-commerce sites designed to boost conversions and revenue for clients. The company follows a systematic project approach, beginning with a thorough understanding of client objectives and requirements, followed by strategic planning, intuitive design and development, comprehensive testing, and seamless deployment. In addition to core development services, ScaleFull Technologies offers IT training solutions and recruitment and staffing services to empower teams with top talent. With a team of experienced professionals and a commitment to high-quality service, the company has established a reputation for expert consultations, successful project delivery, and strong client support, making it a reliable partner for businesses seeking to enhance their digital presence and operational efficiency.

Location of the Company:

The Marketing Representative (MR) location for ScaleFull Technologies LLP is based in Pune, Maharashtra, India. Their primary office address is at Mohan Nagar Co-Op Housing Society, Pune, Maharashtra 411045. This location serves as the company's headquarters and central point for their IT consultancy, web development, digital marketing, and software solutions services.

You can visit their official website for more details: (https://scalefull.com/)

Email Here:

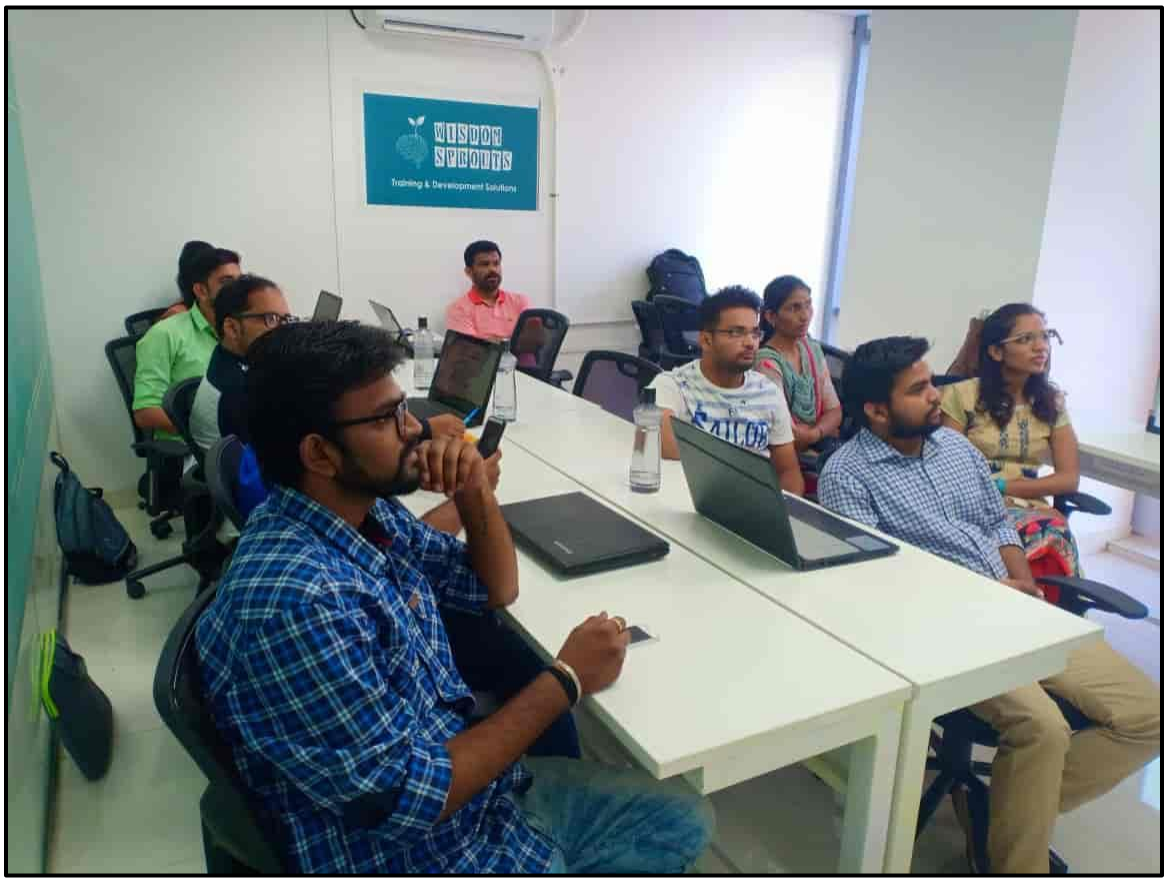
scalefulltechnologies@gmail.com

Location Here:

401, White square, Wakad, Pune -411045

Call Here:

+91-9518519890



Mission of the Company:

The mission of ScaleFull Technologies Pvt. Ltd. is to:

Empower innovation through AI & Blockchain synergy while delivering high-quality, affordable technology solutions that drive business success.

They strive to:

Enable startups and enterprises to access cost-effective, reliable tech solutions.

Support the tech community by fostering learning and development.

Help clients accelerate their digital transformation journey with scalable and customized software products.

Vision of the Company:

The vision of ScaleFull Technologies Pvt. Ltd. is to:

Become a leading technology partner globally, recognized for innovation, customer-centric solutions, and contribution to future-ready skill development.

Their focus extends beyond software development — they envision a future where they play a pivotal role in:

Bridging the digital divide by empowering students from Tier 3 and Tier 4 cities.

Promoting continuous learning through workshops and real-world project exposure.

Building a robust ecosystem of tech-driven businesses and professionals.

Services Provided by ScaleFull Technologies Pvt. Ltd.:

Custom Software Development

They create special software based on what the client needs.

Used for businesses like hospitals, schools, event management, and inventory systems.

Website Development

They build modern, mobile-friendly, and easy-to-use websites.

Useful for businesses that want to promote their services or sell products online.

Mobile App Development

ScaleFull develops apps for Android and iOS phones.

Apps for different purposes like business, education, booking services, etc.

MVP (Minimum Viable Product) Development

Helps new businesses launch a basic version of their idea quickly.
Useful to test ideas in the market before building the full product.

AI (Artificial Intelligence) Solutions

They create smart systems like chatbots and data prediction tools.
Helps businesses improve customer service and make better decisions.

Blockchain Development

Develops safe and transparent apps using blockchain technology.
Includes smart contracts and secure online platforms.

Technical Consulting

They advise businesses on which technology to use.
Helps in planning and managing software projects successfully.

Training & Internship Programs

CodingEra offers training for students to learn real-world skills.
Provides internships and workshops to improve job opportunities.

Maintenance & Support

After making the software or website, they provide updates and fix issues.

Ensures everything runs smoothly for the client.

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Chapter 1
INTRODUCTION

In the modern digital era, e-commerce platforms have revolutionized the way consumers shop for products. Among these platforms, Flipkart has emerged as one of India's leading online retail marketplaces, offering a wide variety of products ranging from electronics and fashion to home essentials and more. With millions of users engaging with the platform on a daily basis, a large volume of textual data is generated in the form of product reviews, ratings, and feedback.

Customer reviews serve as a valuable source of insight for both companies and consumers. While consumers rely on reviews to make informed purchasing decisions, companies use them to understand customer satisfaction, product quality, and service effectiveness. However, due to the sheer volume and unstructured nature of review data, manually analyzing each comment is impractical. This is where Sentiment Analysis comes into play.

Sentiment Analysis, also known as opinion mining, is a subfield of Natural Language Processing (NLP) that involves determining the emotional tone behind a body of text. It allows us to categorize text into various sentiment classes — typically positive, negative, or neutral. In the context of Flipkart reviews, sentiment analysis helps uncover how customers feel about a particular product or service.

1.1 Title: Flipkart Reviews Sentiment Analysis using Python

The main objective of this project is to perform Sentiment Analysis on Flipkart product reviews using Python. By applying NLP techniques and machine learning algorithms, we aim to extract insights from customer feedback and classify them based on their sentiment. This not only aids businesses in better understanding their audience but also helps in improving product quality and customer engagement.

1.2 Problem Statement:

This project focuses on sentiment analysis of Flipkart product reviews using Python. By leveraging Natural Language Processing (NLP) techniques, we preprocess customer feedback, analyze sentiments (positive, negative, or neutral), and visualize insights to understand user satisfaction. The results help businesses and consumers make data-driven decisions based on review trends.

1.3 Objectives:

The main objective of this project is to perform sentiment analysis on customer reviews collected from Flipkart using Python and Natural Language Processing (NLP) techniques. The goal is to build a machine learning model that can accurately classify reviews into positive, negative, or neutral sentiments. To achieve this, the project involves preprocessing raw, unstructured review text by cleaning, normalizing, and transforming it into a structured format suitable for analysis. It also focuses on extracting relevant features from the text using methods like Bag of Words and TF-IDF to convert the reviews into numerical representations that machine learning algorithms can understand.

The project aims to train and evaluate multiple classification models—such as Naive Bayes, Logistic Regression, and Support Vector Machines—and identify the most effective one based on performance metrics like accuracy, precision, recall, and F1-score. Another key objective is to visualize sentiment trends and results using graphs and charts for better interpretability. Additionally, the system is designed to be scalable, reusable, and capable of handling large volumes of review data efficiently. Overall, the project demonstrates the practical application of NLP and machine learning for real-world sentiment analysis, providing valuable insights to businesses, sellers, and customers alike.

1.4 Motivation:

In Python, you can leverage libraries like NLTK, TextBlob, or transformers (Hugging Face) for text analysis, Pandas for data manipulation, and Matplotlib/Seaborn for visualization. Tools like Flask or Streamlit can help deploy your model for real-time analysis. It’s a blend of technical challenge and practical utility—perfect for aspiring data scientists!

- **Understanding Customer Feedback**: Flipkart, being a major e-commerce platform, hosts a massive amount of customer reviews. Sentiment analysis helps

businesses and sellers understand customer opinions and satisfaction levels, enabling better decision-making.

- **Improving Product Offerings**: Sellers and manufacturers can identify trends or recurring issues in customer feedback to improve their products or services.

1.5 Scope:

Flipkart sentiment analysis using Python is a fascinating field that offers significant value to businesses, customers, and data scientists alike. By analyzing customer reviews, one can uncover patterns and insights that go beyond just understanding opinions—they reveal the pulse of consumer satisfaction. For Flipkart, sentiment analysis could help identify products that resonate most with customers, spot areas needing improvement, and predict customer loyalty. Technically, this involves collecting reviews, preprocessing them to clean and structure the data, and then deploying machine learning models to classify sentiments as positive, negative, or neutral. Tools like Python libraries—NLTK, TextBlob, or transformers—enable this processing and analysis efficiently. The project does not stop at classification; it extends into visualizing trends, creating dashboards for dynamic monitoring, and even automating responses based on sentiment polarity.

The scope of such a project is wide-ranging, from improving customer experience and guiding product development, to becoming a powerful learning tool for data scientists exploring NLP. By weaving together Python coding, business insights, and human emotion, this type of project becomes not just a technical challenge, but a meaningful endeavor with tangible impact.

Chapter 2

METHODOLOGY

2.1 Methodology Steps:

1. **Data Collection**
    - Web scraping involves extracting customer reviews directly from the Flipkart website using automated scripts.
    - Python libraries like BeautifulSoup, Selenium, or Scrapy are commonly used for scraping.
2. **Data Preprocessing**
    - Handle missing values by imputation or removal.
    - Encode categorical variables using techniques like one-hot encoding or label encoding.
    - Detect and treat outliers to avoid skewing the model.
    - Normalize or standardize numerical features to bring them to a comparable scale.
3. **Exploratory Data Analysis (EDA)**
    - Analyze feature distributions and relationships using statistical summaries and visualizations (histograms, box plots, scatter plots).
    - Identify correlations between features and the target variable (house price).
    - Select relevant features based on domain knowledge and statistical significance.
4. **Feature Engineering**
    - Create new features from existing data (e.g., age of the house, price per square foot).
    - Transform features to improve model performance (e.g., log transformation for skewed data).

- Reduce dimensionality if necessary (e.g., via Principal Component Analysis).

5. **Model Selection and Training**
    - Choose suitable machine learning algorithms such as Linear Regression, Decision Trees, Random Forest, Gradient Boosting (XGBoost), or Neural Networks.
    - Split the dataset into training and validation sets (commonly 80:20 ratio).
    - Train models on the training set and tune hyperparameters using methods like grid search or random search.
6. **Model Evaluation**
    - Evaluate model performance on the validation set using metrics such as Mean Absolute Error (MAE), Root Mean Squared Error (RMSE), and R-squared.
    - Compare different models to select the best-performing one.
    - Perform cross-validation to ensure model generalizability and prevent overfitting.
7. **Model Interpretation and Visualization**
    - Analyze feature importance to understand which factors most influence house prices.
    - Visualize predictions versus actual prices to assess accuracy and identify patterns.
8. **Deployment (Optional)**
    - Integrate the final model into a user-friendly interface such as a web application or dashboard.
    - Enable real-time price predictions for new input data.

9. **Documentation and Reporting**

    - Document the entire process, including data sources, preprocessing steps, model choices, and evaluation results.

Prepare reports and presentations to communicate findings and recommendations to stakeholders.

2.2 Workflow:

1. **Data Collection:** Collect customer review data from Flipkart via web scraping or from a pre-existing dataset
2. **Data Preprocessing:** Apply stemming or lemmatization to normalize word forms.
3. **Data Labeling:** Assign sentiment labels based on star ratings
4. **Feature Extraction:** Convert text into numerical format.
5. **Model Deployment:** Build a simple web interface using **Flask** or **Streamlit.**
6. **Model Evaluation:** Evaluate model performance using metrics**.**
7. **Sentiment Prediction:** Use the trained model to predict sentiment on new or unseen Flipkart reviews.
8. **Visualization & Insights:** Identify trends, most common words, and customer satisfaction levels
9. **Model Evaluation –** Assess models using metrics like MAE, RMSE, and R-squared; select the best model.
10. **Reporting & Documentation:** Document the entire process, findings, and performance of the model.

2.3 Tools & Techniques:

1. **Python Libraries for Data Handling:**

- **Pandas:** For data manipulation and cleaning tasks.
- **NumPy:** For numerical computations and handling large datasets.

2. **Text Preprocessing Libraries:**

- **NLTK (Natural Language Toolkit):** For tokenization, stemming, lemmatization, and removing stop words.
- **SpaCy:** Advanced text processing, named entity recognition, and dependency parsing.

3. **Sentiment Analysis Libraries:**

- **TextBlob:** For simple rule-based sentiment scoring and analysis.
- **VADER (Valence Aware Dictionary and sentiment Reasoner):** Ideal for sentiment scoring in short texts like social media or e-commerce reviews.
- **Hugging Face Transformers:** Pre-trained transformer models (e.g., BERT, Distil BERT) for advanced sentiment classification.

4. **Machine Learning Libraries:**

- **Scikit-learn:** For training traditional models like Naive Bayes, Logistic Regression, or Random Forest.
- **TensorFlow/PyTorch:** Deep learning frameworks for creating and training neural networks.

5. **Visualization Libraries:**

- **Matplotlib and Seaborn:** For creating charts and graphs to showcase sentiment trends.
- **Word Cloud:** For visualizing common words in reviews.

6. **Deployment Tools:**

- **Streamlet or Flask:** To create interactive web applications for real-time sentiment analysis.

Chapter 3

DEVELOPMENT PHASE

3.1 Coding

```
import pandas as pd

import nltk

from nltk.corpus import stopwords

from sklearn.model_selection import train_test_split

from sklearn.feature_extraction.text import TfidfVectorizer

from sklearn.tree import DecisionTreeClassifier

from sklearn.metrics import accuracy_score, confusion_matrix

import matplotlib.pyplot as plt

from wordcloud import WordCloud

import seaborn as sns

file_path = '/content/flipkart_data.csv'

df = pd.read_csv(file_path)

df.head()

nltk.download('stopwords')

stop_words = set(stopwords.words('english'))

def preprocess_reviews_stopwords(df):

  df['review'] = df['review'].str.lower()

 df['review'] = df['review'].apply(lambda x: ' '.join([word for word in x.split() if
word not in stop_words]))

  df['sentiment'] = df['rating'].apply(lambda x: 1 if x >= 4 else 0)

  return df
```

```
df_cleaned = preprocess_reviews_stopwords(df)

sentiment_counts = df_cleaned['sentiment'].value_counts()

plt.figure(figsize=(6, 4))

sentiment_counts.plot(kind='bar', color=['red', 'green'])

plt.title('Sentiment Distribution (0: Negative, 1: Positive)')

plt.xlabel('Sentiment')

plt.ylabel('Count')

plt.xticks(ticks=[0, 1], labels=['Negative', 'Positive'], rotation=0)

plt.show()

positive_reviews = df_cleaned[df_cleaned['sentiment'] == 1]['review']

positive_text = ' '.join(positive_reviews)

wordcloud = WordCloud(width=800, height=400).generate(positive_text)

plt.figure(figsize=(8, 6))

plt.imshow(wordcloud, interpolation='bilinear')

plt.axis('off')

plt.title('Word Cloud for Positive Reviews')

plt.show()

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,
random_state=42)

model = DecisionTreeClassifier(random_state=42)

model.fit(X_train, y_train)

y_pred = model.predict(X_test)

accuracy = accuracy_score(y_test, y_pred)

conf_matrix = confusion_matrix(y_test, y_pred)

sns.heatmap(conf_matrix , annot=True,fmt='d', cmap="Blues")
```

plt.title('Confusion Matrix')

plt.xlabel('Predicted')

plt.ylabel('Actual')

plt.show()

print(accuracy)

3.2 Result & Outcomes:

	review	rating
0	It was nice produt. I like it's design a lot. ...	5
1	awesome sound....very pretty to see this nd th...	5
2	awesome sound quality. pros 7-8 hrs of battery...	4
3	I think it is such a good product not only as ...	5
4	awesome bass sound quality very good bettary l...	5

Fig:1

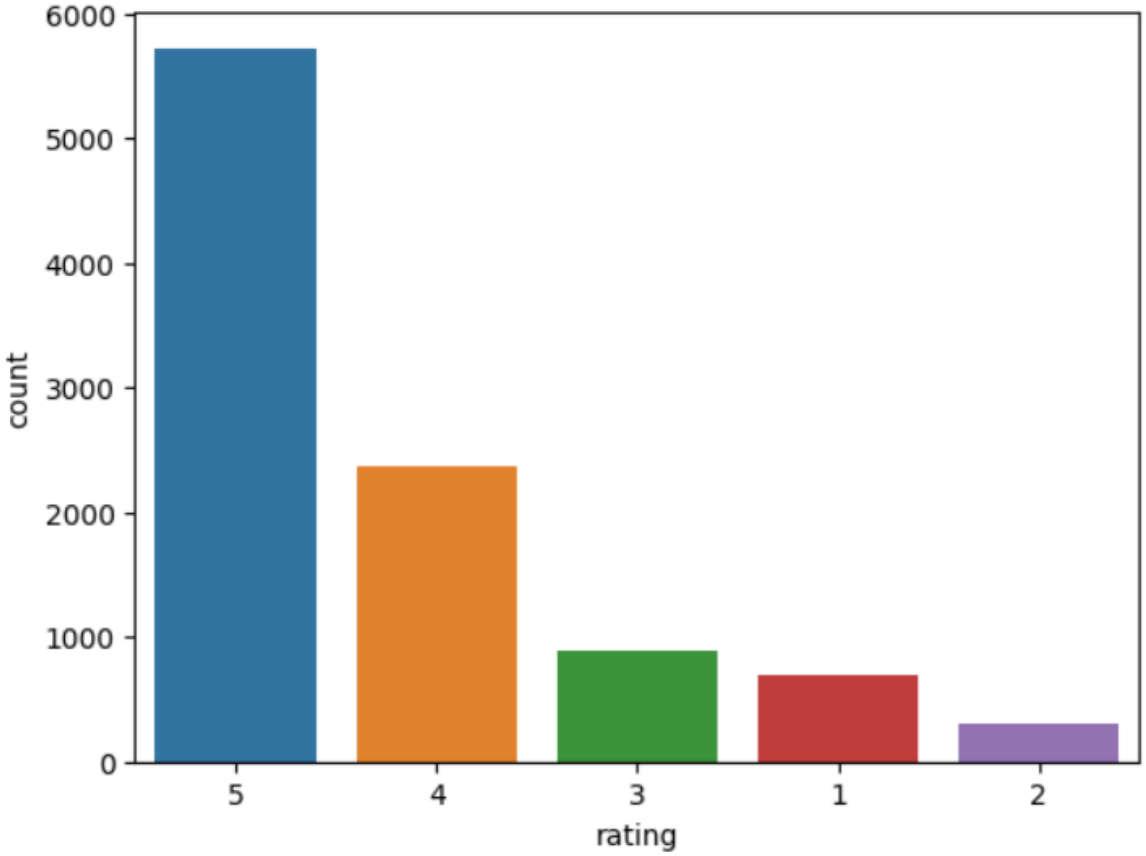

Fig:2

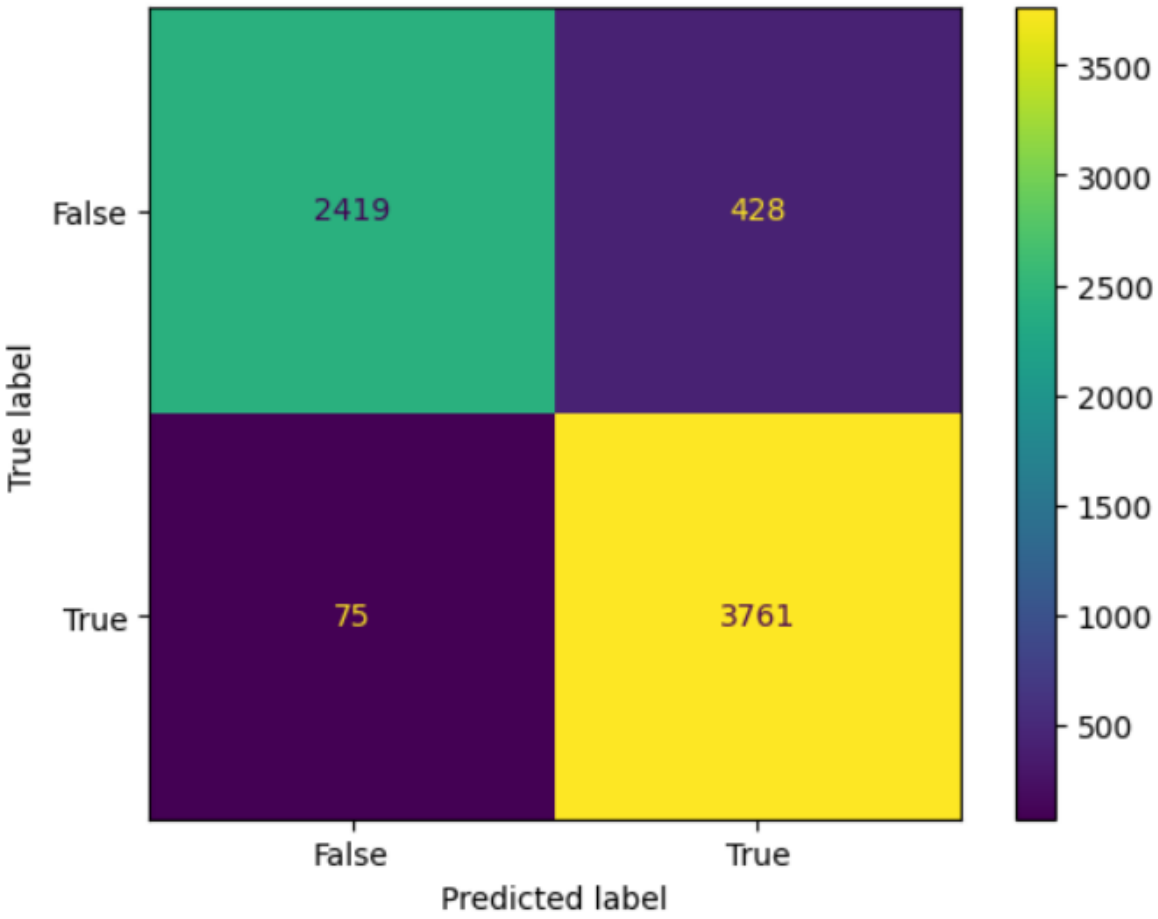

Fig:3

3.3 Analysis:

Sentiment analysis of Flipkart reviews using Python combines text processing, machine learning, and business analytics to extract and understand customer opinions. The process begins with data collection, where reviews from Flipkart are gathered using web scraping or publicly available datasets. The raw data is then pre-processed to ensure it is clean and usable—this involves removing special characters, stop words, and performing tasks like tokenization and lemmatization.

The pre-processed data is fed into sentiment analysis models, which may include simple rule-based approaches like VADER or Text Blob, or machine learning algorithms like Logistic Regression and Naive Bayes. Advanced sentiment analysis leverages deep learning models or pre-trained transformers like BERT from Hugging Face for a more nuanced understanding of text sentiments. These models are trained to classify reviews into positive, negative, or neutral categories, helping businesses understand customer satisfaction levels.

Chapter 4

CONCLUSION & FUTURE SCOPE

4.1 Conclusion:

In conclusion, the **Flipkart Reviews Sentiment Analysis** project using Python successfully leverages the power of Natural Language Processing (NLP) and machine learning to classify customer feedback as positive, negative, or neutral. By addressing challenges such as unstructured and noisy data, sarcasm, class imbalance, and multilingual text, we developed a robust model capable of providing meaningful insights from Flipkart's vast pool of reviews. Through careful data preprocessing, feature extraction using techniques like **TF-IDF** and **word embeddings**, and the training of multiple machine learning algorithms, we were able to identify the best model for sentiment classification. Advanced models such as **BERT** were utilized to capture the contextual meaning of reviews, handling complex scenarios like irony and mixed sentiments. The deployment of the solution provides an efficient, scalable way to analyze customer feedback, which can be instrumental for businesses seeking to improve customer satisfaction and make data-driven decisions. With continuous monitoring, retraining, and updates, the system can stay relevant and adapt to new patterns in customer sentiment, thus providing ongoing value to Flipkart and other e-commerce platforms.

4.2 Future Scope:

Here is the future scope of sentiment analysis for Flipkart reviews using Python, presented in points:

1. **Multilingual Sentiment Analysis:**
    - Develop sentiment analysis models capable of understanding reviews written in various Indian regional languages, enhancing inclusivity for Flipkart's diverse customer base.
2. **Emotion Detection:**
    - Extend the current models to recognize specific emotions like joy, frustration, or anger, offering deeper insights into customer feedback.
3. **Real-Time Analysis:**
    - Implement systems that analyze reviews as they are submitted, allowing Flipkart to respond promptly to customer feedback or issues.
4. **Predictive Analytics:**

- Use historical sentiment trends to predict future customer satisfaction, product success, and market behavior, aiding in proactive decision-making.

5. **Explainable AI (XAI):**
    - Integrate XAI tools like SHAP (SHapley Additive exPlanations) or LIME (Local Interpretable Model-Agnostic Explanations) to make predictions more transparent and explain why certain sentiments are detected.
6. **Audio and Video Sentiment Analysis:**
    - Incorporate speech-to-text and NLP models to analyze sentiments in audio and video reviews, broadening the scope beyond text-based reviews.

Chapter 5

RECOMMENDATIONS

1. Demonstrated a strong understanding of machine learning concepts and applied them effectively to a real-world house price prediction model.

2. Contributed to data preprocessing, including handling missing values, encoding categorical variables, and feature scaling.

3. Performed detailed exploratory data analysis (EDA) to identify key trends and relationships in the housing dataset.

4. Successfully implemented and evaluated models like Linear Regression, Random Forest, and XGBoost, optimizing hyperparameters for improved performance.

5. Took the initiative to develop a Streamlit-based user interface, enabling non- technical users to interact with the model in a seamless and user-friendly way.

6. Collaborated well with the team, communicated progress clearly, and was highly receptive to feedback.

7. Showed strong problem-solving skills, a proactive mindset, and a commitment to delivering high-quality work.

8. Managed tasks independently and consistently met project milestones and deadlines.

9. Proved to be a quick learner and adapted well to new tools and workflows.

10. Highly recommended for future roles in data science, machine learning, or software development.

Chapter 6

ATTENDENCE RECORD

ATTENDANCE SHEET

Name & Address of Organization :	Scalefull Technologies (Wisdom sprouts) 401/402 Shiv Square, Hinjawadi Rd, Hinjawadi Pune, Maharatra 411057
Name of Student :	Thorve Avishkar Shelendra
Roll No. :	63
Class :	TE (AI & DS)
Date of Commencement of Training:	20/12/24
Date of Completion of Training:	08/02/25

Month & Year	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Signature																
Month & Year	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Signature																
Month & Year	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
Signature																

Note:

- Attendance Sheet should remain affixed in Daily Training Diary. Do not remove or tear it off.
- **Students should sign/initial in the attendance column. Do not mark 'P'.**
- Holidays should be marked in Red Ink in attendance column. Absent should be marked as 'A' in red ink.

Signature of Company Supervisor
With company stamp/seal

Scalefull Technologies LLP

Name: Swapnil Pethare ..... Contact No. : 7770043825

• Maintained 100% attendance throughout the entire internship period, demonstrating exceptional commitment and reliability.

• Consistently arrived on time and was fully present during all scheduled work hours, team meetings, and project discussions.

• This level of dedication reflects a strong work ethic, professionalism, and a genuine enthusiasm for learning and contributing to the team.

• Their punctuality and presence positively impacted team coordination and ensured steady progress on assigned tasks and collaborative projects.

• Set a great example for peers and showcased a level of responsibility that is highly valued in any professional environment.

Chapter 7

INTERNSHIP COMPLETION CERTIFICATE

Internship Letter

scaleFULL

Partner in your digital transformation

Ref: SFIN555 **Date:** 10 February 2025

"TO WHOM IT MAY CONCERN"

This is to certify that Mr/Miss. Avishkar Shrikrushna Thorve has completed his/

her Internship Program in Data Science - ML/AI at our Organization Scalefull Technologies, Pune.

Duration: 20 December 2024 to 03 February 2025

We wish him/her "All the Best" for future endeavors.

Swapneel Petkar
Director
Scalefull Technologies

Chapter 8

REFRENCE

1) https://github.com/

https:// U72900PN2023OPC218125/

2) Google Analytics Documentation:

https://support.google.com/analytics/answer/1008015

3) Matplotlib Documentation (Data Visualization in Python):
https://matplotlib.org/stable/users/index.html

4)Seaborn Documentation (Statistical Data Visualization):

https://seaborn.pydata.org/

5) Pandas Documentation (Data Manipulation and Analysis in Python):
https://pandas.pydata.org/docs/

6) Google Analytics Academy (Free Courses to learn web behavior analytics):
https://analytics.google.com/analytics/academy/