Sentiment Analysis on Amazon Alexa Product Reviews

Using NLP Techniques in Python

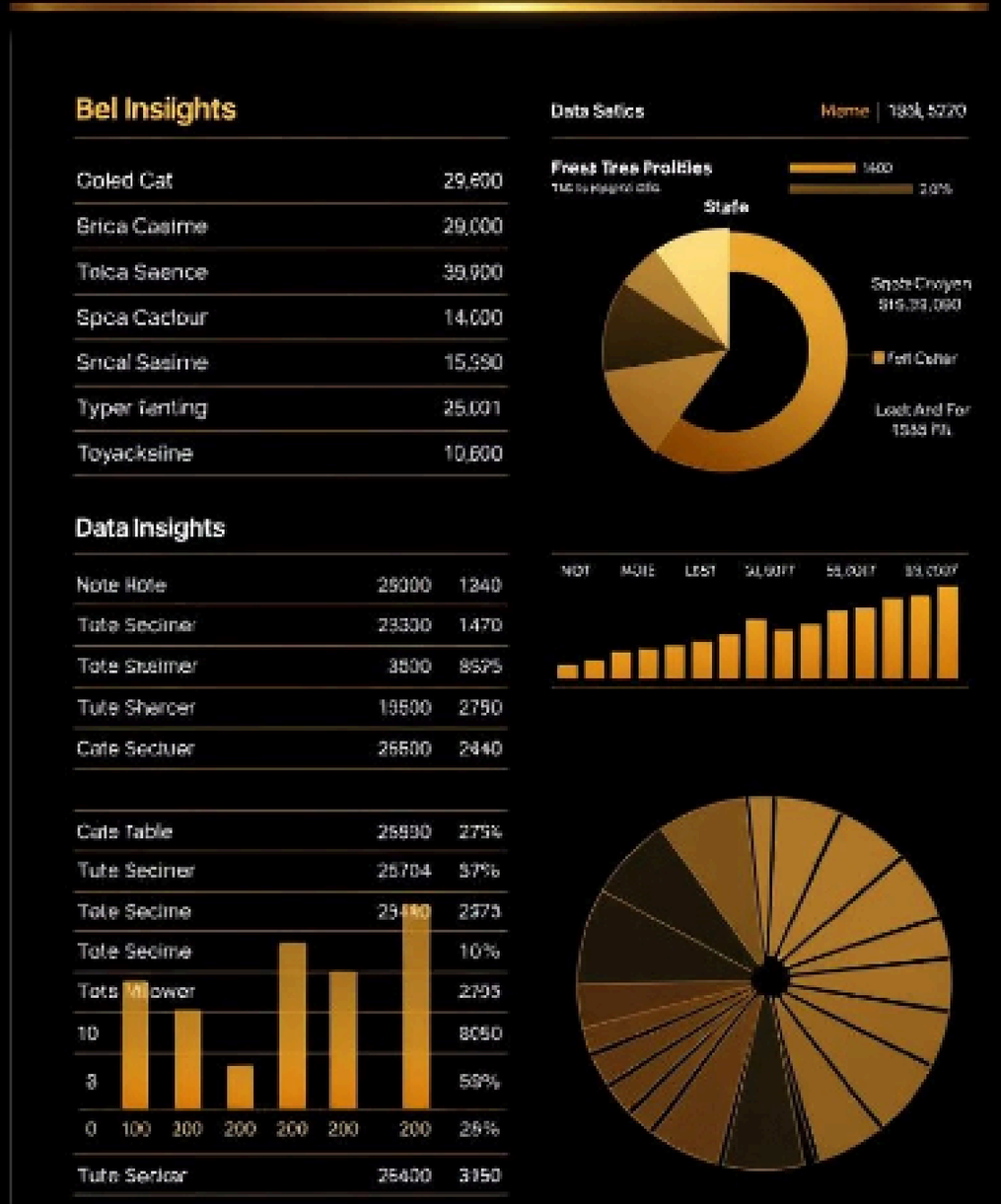
Introduction :

What is Sentimental Analysis ?

Sentiment analysis is a technique in Natural Language Processing (NLP) used to determine the emotional tone or attitude expressed in a piece of text (e.g., positive, negative, or neutral).

Objective of Sentiment Analysis :

- Identify if text expresses positive, negative, or neutral feelings.
- Understand customer opinions from reviews or feedback.
- Monitor brand reputation on social media and review platforms.
- Improve products and services based on customer emotions.



Dataset Overview

Source

Kaggle (Amazon Alexa Reviews Dataset)

Dataset Details

Number of records : 3150

Key Columns

Customer feedback, Ratings, Sentiment (positive/negative)

Data Type

Structured text data

Tools and Libraries Used

Python

Jupyter Notebook

NLTK

pickle

Pandas

NumPy

Matplotlib

Seaborn

WordCloud

Scikit-learn

Random Forest

XGBoost

Data Exploration (EDA)

1 **Ratings Distribution**

Analyzed distribution of ratings (1–5 stars).

2 **Common Keywords**

Identified common keywords in reviews.

3 **Sentiment Frequency**

Determined frequency of positive vs. negative sentiments.

Data Preprocessing:

- **Clean Text**: Remove non-alphabet characters.
- **Convert to Lowercase**: Make all text lowercase for uniformity.
- **Tokenize**: Split text into individual words.
- **Remove Stopwords**: Exclude common words that don't add meaning (e.g., "and", "the")
- **Create Corpus**: Store the cleaned text in a list for processing.
- **Feature Extraction**: Use CountVectorizer to convert text into numbers for machine learning.
- **Split Data**: Separate features (X) and labels (y) for training the model.

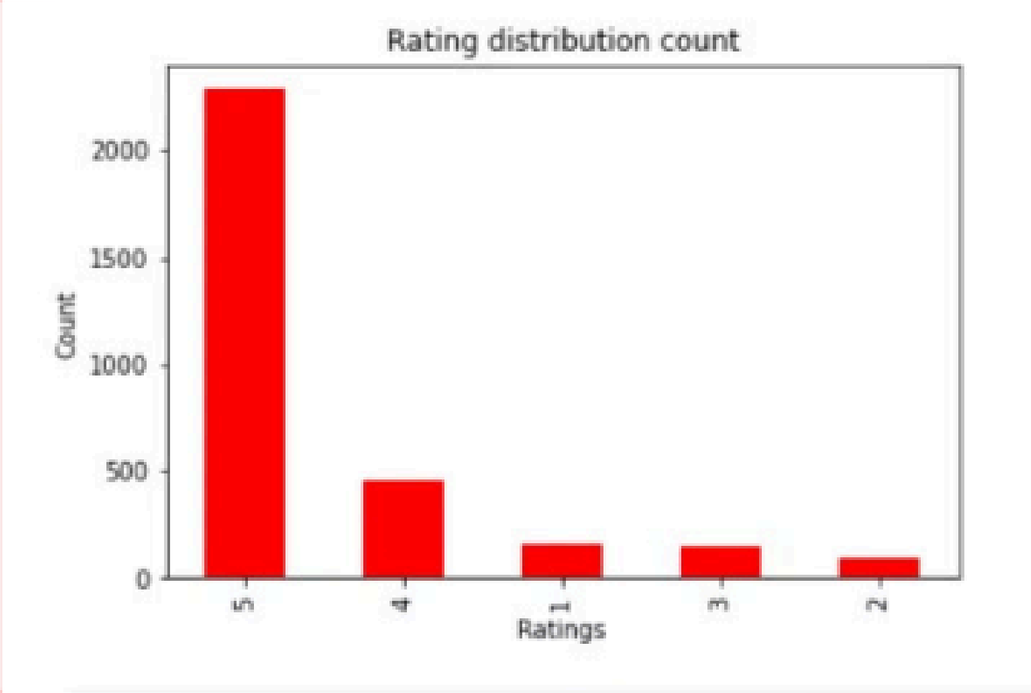
Modeling Approach

Models Used

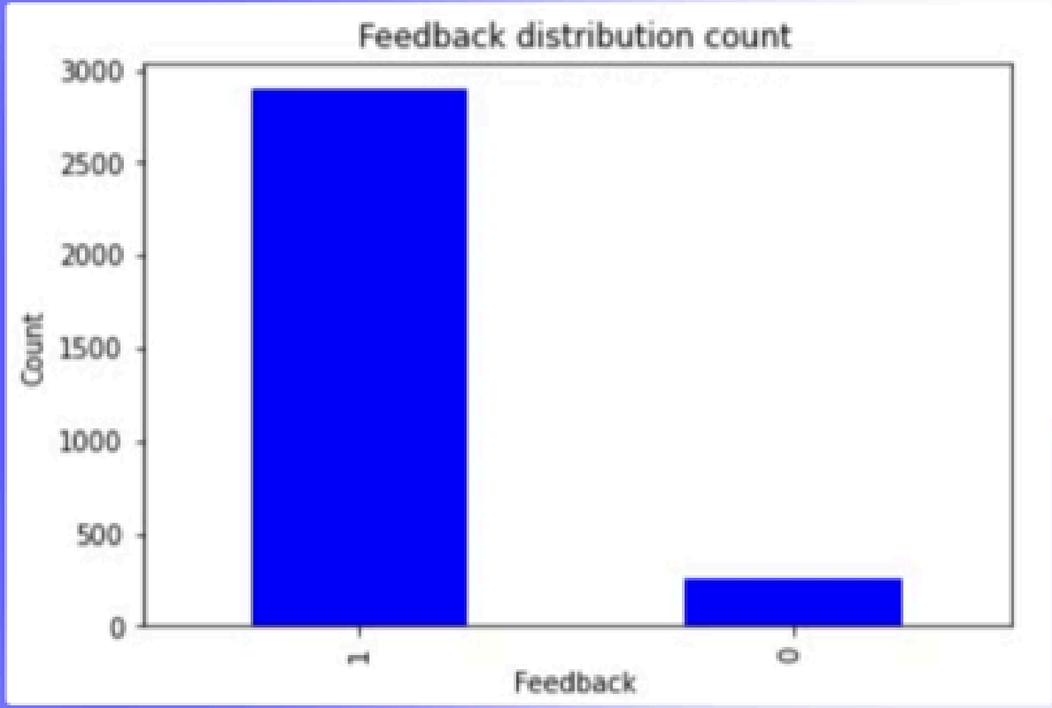
- [ ] Random Forest
- [ ] XGBoost

Model Merits

- [ ] Random Forest : Handle Large Data , Identify Sentiments.
- [ ] XGBoost : Accuracy, Efficiency.

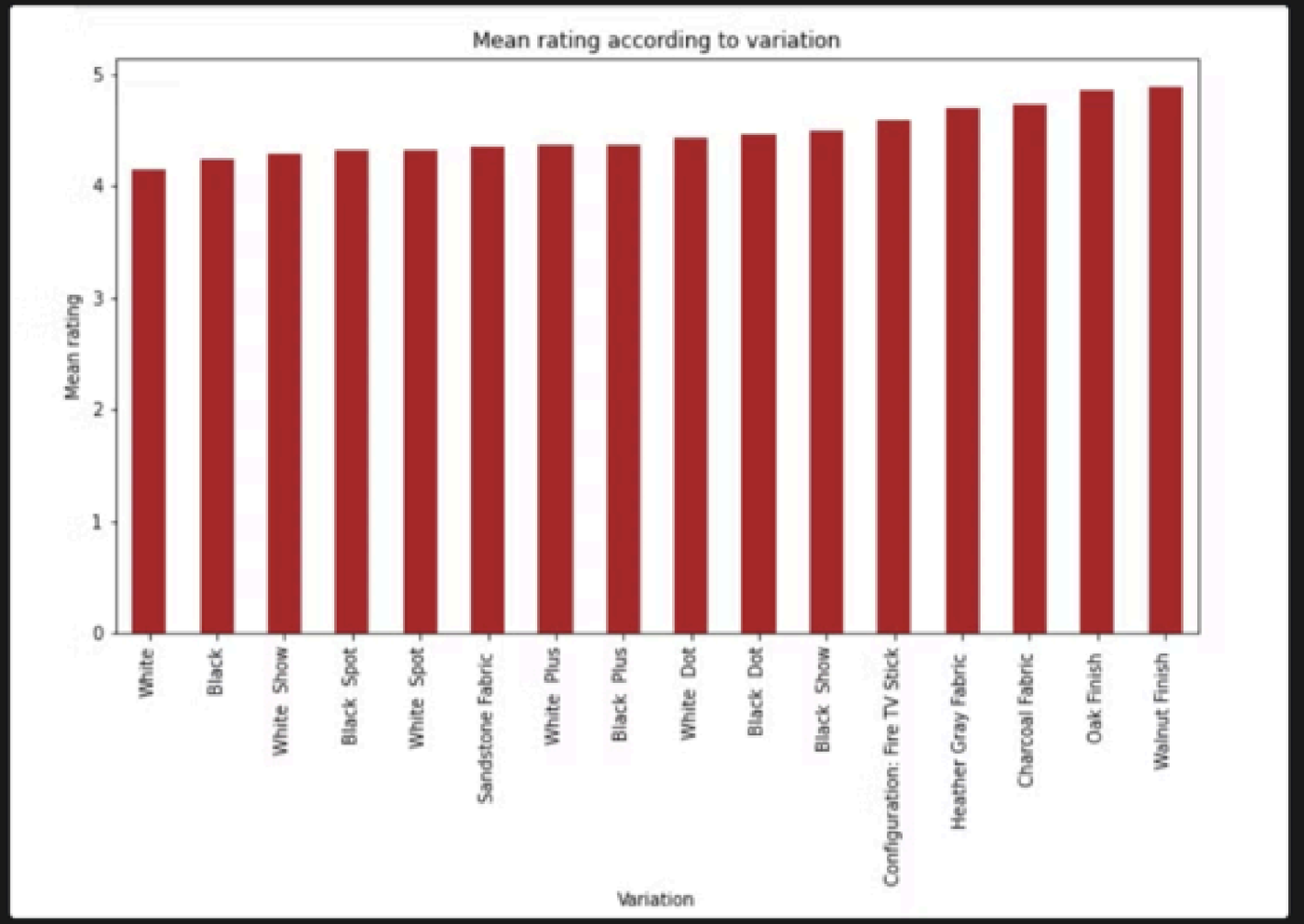


Ratings of Customers



Feedback of customer

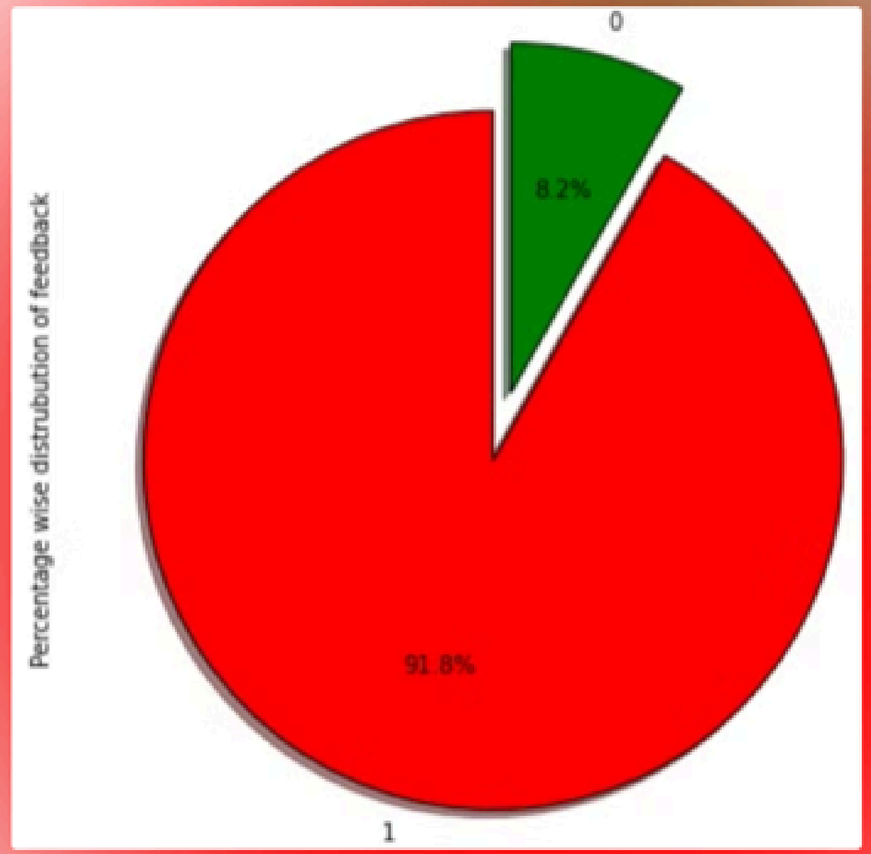
Other Alexa Variation model Reviews



Positive and Negative Words in WordCloud

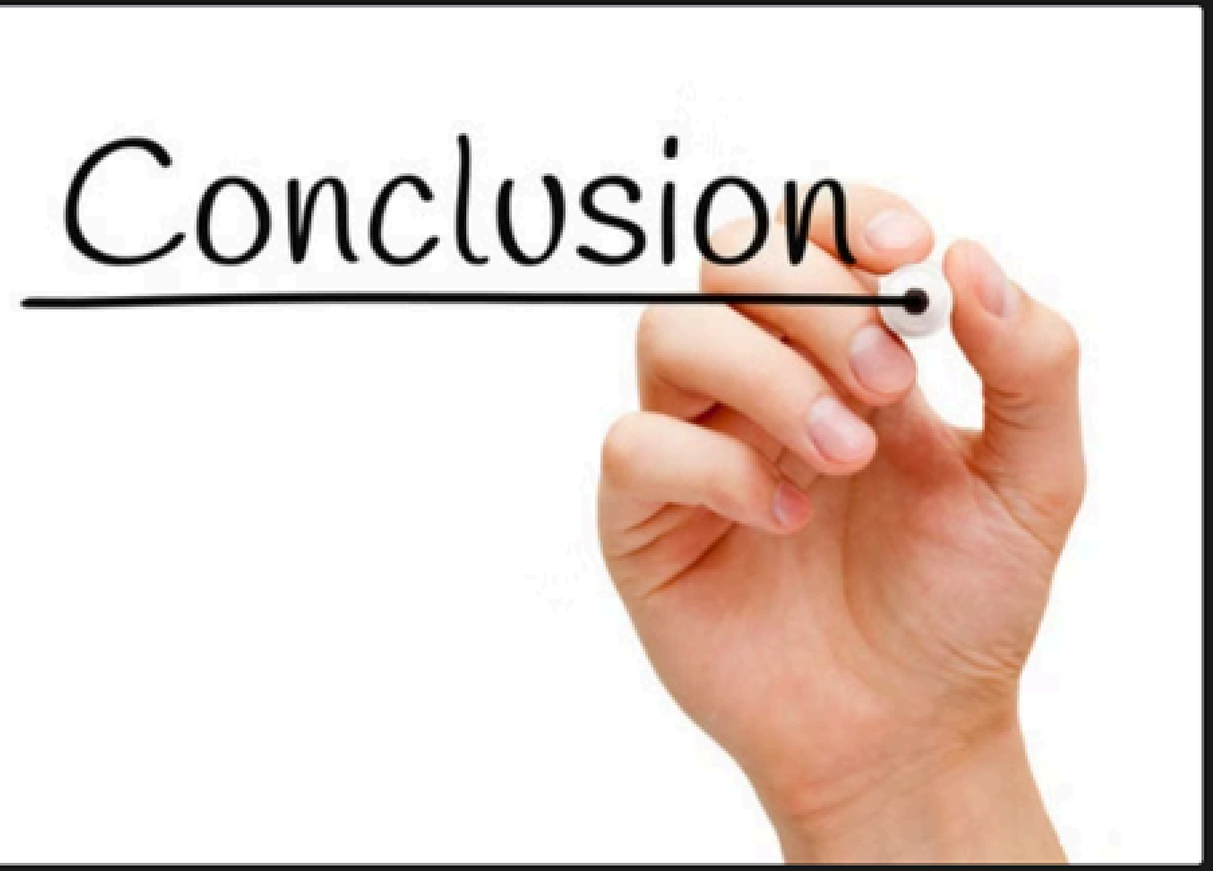
Positive Words about Alexa

Negative Words about the Alexa



Percentage of Sentiment Analysis of Feedback by Customers on Alexa

- **91.87%** reviews are **positive** 😊
- **8.13%** reviews are **negative** 😑



Successfully classified reviews into positive and negative sentiments.

Provided valuable feedback for improving Amazon Alexa products.