**Sentimental Analysis on Customer Reviews**

**Overview**

This sentiment analysis project focuses on analyzing customer reviews to determine sentiment polarity (positive, negative, or neutral) using Natural Language Processing (NLP) techniques. The analysis involves preprocessing, feature extraction, and employing multiple machine learning models for prediction.

**Objective**

The primary objective of this project is to classify customer reviews into sentiment categories (positive, negative, or neutral) to extract insights into customer satisfaction and product feedback.

**Steps Involved**

1. **Data Reading**
   * Input: A .CSV file containing customer reviews.
   * Libraries Used: **numpy**, **pandas**, **NLTK**, **Scikit**, **Keras**.
   * The dataset is loaded using **pandas** for further analysis.
2. **Data Preprocessing**
   * Lowercasing: Uniformity in text by converting all characters to lowercase.
   * Regex for Special Characters Removal: Elimination of irrelevant characters using regular expressions.
   * Tokenization: Segmentation of text into words or tokens.
   * Handling Null/Missing Values: Addressing missing values using appropriate techniques.
   * Stopwords Removal: Elimination of common stop words to focus on meaningful words.
3. **Feature Extraction**
   * Feature extraction involves converting text data into a numerical format suitable for machine learning models.
   * Count Vectorizer: Utilization of the Count Vectorizer for feature extraction.
4. **Data Splitting**
   * Splitting the dataset into training and testing subsets for model evaluation.
5. **Sentiment Analysis Models**
   * Three models used for sentiment analysis:
     + Logistic Regression
     + Naïve Bayes
     + LSTM (Long Short-Term Memory) using Keras
6. **Model Training and Evaluation**
   * Training each model on the training dataset.
   * Model Evaluation: Assessing model accuracy, precision, recall, and F1-score.
   * Obtaining accuracy predictions from all three models.

**GitHub Repository**

* The code and implementation details are available in the GitHub repository [link to repository](https://github.com/kalydutta/SentimentAnalysis.git).
* The repository includes code for data preprocessing, feature extraction, model training, and evaluation using the described models.

**Conclusion**

This sentiment analysis project provides a comprehensive approach to understanding customer sentiments from reviews. It employs various NLP techniques and multiple machine learning models to classify sentiments accurately.