Experiment No-12

Title: Implementation of Design and analysis of sentiment analysis model

Aim: Implementation of Design and analysis of sentiment analysis model

Theory:-

Sentiment analysis is a popular task in natural language processing. The goal of sentiment analysis is to classify the text based on the mood or mentality expressed in the text, which can be positive negative, or neutral.

It is the process of classifying whether a block of text is positive, negative, or, neutral. The goal which Sentiment analysis tries to gain is to be analyzed people's opinions in a way that can help businesses expand. It focuses not only on polarity (positive, negative & neutral) but also on emotions (happy, sad, angry, etc.). It uses various Natural Language Processing algorithms such as Rule-based, Automatic, and Hybrid.

Sentiment analysis is the contextual meaning of words that indicates the social sentiment of a brand and also helps the business to determine whether the product they are manufacturing is going to make a demand in the market or not.

There are three approaches used:

1. **Rule-based approach:** Over here, the lexicon method, tokenization, and parsing come in the rule-based. The approach is that counts the number of positive and negative words in the given dataset. If the number of positive words is greater than the number of negative words then the sentiment is positive else vice-versa.
2. **Machine Learning Approach:** This approach works on the machine learning technique. Firstly, the datasets are trained and predictive analysis is done. The next process is the extraction of words from the text is done. This text extraction can be done using different techniques such as Naive Bayes, Support Vector machines, hidden Markov model, and conditional random fields like this machine learning techniques are used.
3. **Neural network Approach**: In the last few years neural networks have evolved at a very rate. It involves using artificial neural networks, which are inspired by the structure of the human brain, to classify text into positive, negative, or neutral sentiments. it has Recurrent neural networks, Long short-term memory, Gated recurrent unit, etc to process sequential data like text.
4. **Hybrid Approach:** It is the combination of two or more approaches i.e. rule-based and **Machine Learning** approaches. The surplus is that the accuracy is high compared to the other two approaches.