SATHYABAMA INSTITUTE OF SCIENCE & TECHNOLOGY

SCHOOL OF COMPUTING

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SCSA 2604 NATURAL LANGUAGE PROCESSING LAB

LAB 5: CASE STUDY

AIM: Sentiment Analysis of Product Reviews

Problem Statement:

A company wants to analyze the sentiment of customer reviews for their product. They want to understand whether the reviews are positive, negative, or neutral to gauge customer satisfaction and identify areas for improvement.

Objectives :

Understand Customer Sentiment: Gain insights into the sentiment of customer reviews regarding the product to understand how customers perceive it.

Identify Strengths and Weaknesses: Determine the aspects of the product that customers appreciate (positive sentiment) and areas where improvements are needed (negative sentiment).

Monitor Customer Satisfaction: Monitor changes in sentiment over time to gauge customer satisfaction levels and identify any emerging trends or issues.

Inform Product Development: Use sentiment analysis results to inform product development decisions by focusing on areas highlighted by customers for improvement or enhancement.

Support Marketing Strategies: Utilize sentiment analysis to tailor marketing strategies, messaging, and campaigns based on the predominant sentiment among customers.

Enhance Customer Service: Address negative sentiments and concerns raised by customers in their reviews to enhance customer service and overall customer experience.

Benchmark Performance: Benchmark the sentiment analysis results against competitors' products to gain a comparative understanding of customer sentiment in the market.

Validate Market Research Findings: Validate findings from market research studies through sentiment analysis of actual customer reviews, providing real-world validation of customer perceptions.

Optimize Customer Feedback Analysis: Implement sentiment analysis algorithms to automate the analysis of large volumes of customer feedback efficiently, saving time and resources.

Drive Business Decisions: Use insights from sentiment analysis to make data-driven business decisions aimed at improving customer satisfaction, loyalty, and retention.

By achieving these objectives, the company can gain a comprehensive understanding of customer sentiment towards their product and take proactive steps to enhance product quality, customer service, and overall business performance.

Dataset:

Overall, a well-curated dataset is essential for conducting accurate sentiment analysis and deriving meaningful insights into customer sentiment towards the product.

Approach:

Semantic analysis, particularly sentiment analysis, can be used to analyze the reviews. Sentiment analysis involves determining the sentiment expressed in a piece of text, whether it's positive, negative, or neutral.

Steps:

Data Collection: Obtain a dataset containing customer reviews for the product.

Preprocessing: Clean the data by removing noise, such as special characters, stopwords, and punctuation.

Semantic Analysis: Analyze the sentiment of each review using a pre-trained sentiment analysis model.

Visualization: Visualize the sentiment distribution to gain insights.

Program :

```
import nltk
from nltk.sentiment.vader import SentimentIntensityAnalyzer

# Download NLTK resources (only required once)
nltk.download('vader_lexicon')

# Sample reviews
reviews = [
    "This product is amazing! I love it.",
    "The product was good, but the packaging was damaged.",
    "Very disappointing experience. Would not recommend.",
    "Neutral feedback on the product.",
]

# Initialize Sentiment Intensity Analyzer
sid = SentimentIntensityAnalyzer()

# Analyze sentiment for each review
for review in reviews:
    print("Review:", review)
    scores = sid.polarity_scores(review)
```

```
    print("Sentiment:", end=' ')
    if scores['compound'] > 0.05:
        print("Positive")
    elif scores['compound'] < -0.05:
        print("Negative")
    else:
        print("Neutral")
    print()
```

Output:

Review: This product is amazing! I love it.

Sentiment: Positive

Review: The product was good, but the packaging was damaged.

Sentiment: Negative

Review: Very disappointing experience. Would not recommend.

Sentiment: Negative

Review: Neutral feedback on the product.

Sentiment: Neutral

[nltk_data] Downloading package vader_lexicon to /root/nltk_data...

Result:

This program demonstrates a basic sentiment analysis using the VADER (Valence Aware Dictionary and sEntiment Reasoner) lexicon included in NLTK. It assigns a sentiment score to each review and categorizes it as positive, negative, or neutral based on the compound score.