

Project Report: YouTube Video Comment Analyzer

1. Introduction

This project analyzes YouTube video comments to determine the overall sentiment of viewers using Natural Language Processing (NLP). By utilizing APIs, sentiment analysis libraries, and Python-based processing, the system classifies comments as positive, negative, or neutral while providing a detailed breakdown of the sentiment.

2. Objectives

- Extract and analyze comments from a given YouTube video.
 - Process comments to remove unnecessary elements like emojis and special characters.
 - Use sentiment analysis libraries (NLTK and TextBlob) to classify comments.
 - Provide an overall sentiment score and a detailed sentiment breakdown.
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3. Technology Stack

Technology	Purpose
Python	Programming language used.
Google YouTube API	Fetch YouTube video comments.
NLTK	Sentiment analysis using Vader.
TextBlob	Secondary sentiment analysis library.
Regex	Text cleaning and preprocessing.

4. Workflow

Step 1: Extract Comments

- Use the YouTube API to extract video comments.
- Handle pagination to fetch large numbers of comments.

Step 2: Preprocessing Comments

- Remove emojis and special characters using regex.
- Normalize the text for better sentiment analysis.

Step 3: Sentiment Analysis

- Perform sentiment analysis using two methods:
 - **Vader Sentiment Analyzer (NLTK)**: Classifies comments into various levels of positive, neutral, and negative.
 - **TextBlob**: Calculates polarity and provides an alternative sentiment analysis.

Step 4: Generate Results

- Provide overall sentiment scores.
- Provide detailed percentage-based sentiment breakdown for:
 - Positive, Weakly Positive, Strongly Positive
 - Negative, Weakly Negative, Strongly Negative
 - Neutral sentiments.

5. Implementation

Code Outline

1. **API Integration:**
 - Used the Google YouTube API to fetch comments.
2. **Data Preprocessing:**
 - Removed emojis and unwanted characters with regex.
3. **Sentiment Analysis:**
 - Implemented Vader Sentiment Analysis (NLTK).
 - Used TextBlob for polarity scoring.
4. **Pagination Management:**
 - Handled multiple pages of YouTube comments to process large datasets

6. Sentiment Analysis Metrics

Vader Sentiment Analysis Results

Sentiment Category	Percentage
Strongly Positive	XX%
Positive	XX%
Weakly Positive	XX%
Neutral	XX%
Weakly Negative	XX%
Negative	XX%
Strongly Negative	XX%

- **Overall Sentiment Score (Vader):**
XX% Positive/Negative/Neutral
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TextBlob Sentiment Analysis Results

Sentiment Category	Percentage
Strongly Positive	XX%
Positive	XX%
Weakly Positive	XX%
Neutral	XX%
Weakly Negative	XX%
Negative	XX%
Strongly Negative	XX%

- **Overall Sentiment Score (TextBlob):**
XX% Positive/Negative/Neutral

8. Conclusion

The YouTube Video Comment Analyzer successfully extracts and processes comments from any given YouTube video. Using both Vader and TextBlob sentiment analysis techniques, the system provides reliable sentiment scores and breakdowns. The insights derived can help content creators and researchers understand audience feedback effectively.
