Documentation for Content Analysis and Comment Generation Tool

1. Introduction

The Content Analysis and Comment Generation Tool is a web application that analyzes user-provided text and generates diverse comments. These comments are categorized into five types: Friendly, Funny, Congratulating, Questioning, and Disagreement. The tool leverages natural language processing (NLP) techniques to extract keywords and analyze the sentiment of the input text, which it then uses to generate relevant and varied comments.

2. Architecture

2.1 Frontend

- **HTML**: The structure of the web page, defines the layout of the text area for input, the button to generate comments, and the section to display generated comments.
- **CSS**: Styling for the web page, ensuring a visually appealing and user-friendly interface.
- **JavaScript**: Handles user interactions, such as capturing the text input and sending it to the backend for processing. It also receives the generated comments and dynamically updates the HTML to display them.

2.2 Backend

- **Flask**: A micro web framework for Python used to handle HTTP requests, process the text input, generate comments, and send them back to the front end.

2.3 NLP Libraries

- **nltk (Natural Language Toolkit)**: Used for sentiment analysis with the VADER (Valence Aware Dictionary and sEntiment Reasoner) lexicon.
- **TextBlob**: A library for processing textual data, providing simple API for diving into common natural language processing (NLP) tasks such as part-of-speech tagging, noun phrase extraction, sentiment analysis, classification, translation, and more.
- **spacy**: An industrial-strength NLP library for advanced NLP tasks like named entity recognition (NER) and tokenization.

3. Algorithms Used

3.1 Sentiment Analysis

- **TextBlob**: Analyzes text to determine polarity (range from -1 to 1) and subjectivity (range from 0 to 1).
    - **Polarity**: Measures how positive or negative a text is.
    - **Subjectivity**: Measures how subjective or objective a text is.
- **VADER (Valence Aware Dictionary and sEntiment Reasoner)**: Provides a compound score representing the overall sentiment, as well as positive, negative, and neutral scores.

3.2 Keyword Extraction

- **Named Entity Recognition (NER)**: Using `spacy` to identify entities such as PERSON, ORG, GPE, EVENT, WORK_OF_ART, and PRODUCT.
- **Fallback Keywords**: If no named entities are found, significant tokens are selected excluding stop words and pronouns. This is done by analyzing the part-of-speech tags and excluding common words that don't carry much meaning.

3.3 Comment Generation

- **Friendly Comments**: Generated from positive or neutral sentiment using predefined templates.
- **Funny Comments**: Uses humor based on identified keywords.
- **Congratulating Comments**: Positive reinforcement based on sentiment.
- **Questioning Comments**: Engages the user with questions about the text.
- **Disagreement Comments**: Politely expresses a differing opinion.

4. Instructions for Running the Tool

4.1 Prerequisites

- Python 3.8+
- pip (Python package installer)

4.2 Installation Steps

1. **Clone the Repository**

```
git clone https://github.com/lekshmiiyyer/comment_generator

cd content-analysis-comment-tool
```

2. **Install Dependencies**

   ```
   pip install -r requirements.txt
   ```
3. **Download NLTK Data**
   Open a terminal and run the following commands to download the necessary NLTK data:
   ```
   import nltk

   nltk.download('vader_lexicon')
   ```

4.3 Running the Tool

Start the Backend Server
Navigate to the project directory and run the Flask application:

```
python app.py
```

1. The server will start at `http://127.0.0.1:5000`.
2. **Access the Frontend**
   Open `index.html` in a web browser. Enter your text into the provided text area and click the "Generate Comments" button. The generated comments will be displayed in the right section of the page.

4.4 Example Usage

1. **Input Text**
   "The recent advancements in AI technology are remarkable and promising for the future."
2. **Generated Comments**
   - **Friendly**: "Your positive perspective on AI technology is appreciated!"
   - **Funny**: "That's hilarious! You've got a great sense of humor mentioning AI technology!"
   - **Congratulating**: "Congrats on your unique perspective on AI technology!"
   - **Questioning**: "Can you explain more about AI technology?"
   - **Disagreement**: "I'm not sure I agree with your view on AI technology."

Comment Generator

ipl trophy is mine

Generate Comments

Congratulating

Your thoughts on ipl trophy are quite insightful!

Disagreement

You're entitled to ipl trophy, but I have a different perspective.

Friendly

I hear your concerns about ipl trophy, but let's consider the bright side!

Funny

That's hilarious! You've got a great sense of humor mentioning ipl trophy!

Questioning

Could Your elaborate more on ipl trophy?