Title: Text Generator for Twitter Sentiment Analysis

1. Introduction: The "Text Generator for Twitter Sentiment Analysis" is a Python-based program that utilizes a pre trained sentiment analysis model to generate sentiment labels for Twitter text inputs. This text generator aims to provide quick and automated sentiment analysis for tweets, enabling users to determine the sentiment (positive or negative) of the provided text.

Code Implementation: The Python code consists of the following key components:

2.1. Model Loading: The code loads a pre-trained sentiment analysis model (sentiment_model.h5) using TensorFlow's load_model function. This model has been trained on the Twitter Sentiment 140 dataset, which contains tweets labeled with sentiment scores.

2.2. Tokenization and Lemmatization: To process the input text, the code employs the NLTK library to tokenize the text into individual words using the word_tokenize function. It also utilizes the WordNet Lemmatizer to reduce words to their base or root form, enhancing text normalization and reducing lexical variations.

2.3. Text Cleaning: The clean_text function performs various text cleaning operations on the input text, such as removing mentions, URLs, and non-alphanumeric characters. It converts the text to lowercase and applies tokenization and lemmatization to obtain cleaned tokens.

2.4. Sentiment Analysis: The core functionality of the program lies in the analyze_sentiment function. This function takes the cleaned text, converts it into sequences using the tokenizer, and pads the sequences to a fixed length using the pad_sequences function. The padded sequences are then fed into the loaded sentiment analysis model to obtain the sentiment prediction. If the sentiment score is greater than or equal to 0.5, the label is classified as "Positive"; otherwise, it is classified as "Negative."

Usage: To utilize the text generator, users can provide Twitter text inputs to the program. These inputs can be assigned to the input_text variable, allowing users to test the sentiment analysis functionality. The program will clean the text, predict the sentiment label using the loaded model, and display the input text along with the generated sentiment label.

Dependencies: The code relies on several external libraries and resources, including:
TensorFlow: Deep learning library for loading and utilizing the sentiment analysis model.
NLTK (Natural Language Toolkit): Library for tokenization and lemmatization.
NumPy: Library for handling numerical operations and data structures.

Conclusion: The "Text Generator for Twitter Sentiment Analysis" provides a streamlined approach to generate sentiment labels for Twitter text inputs. By employing a pre-trained sentiment analysis model and text preprocessing techniques, the program enables users to quickly assess the sentiment of tweets. The code can be further extended or integrated into larger projects, such as social media analytics tools or sentiment monitoring systems.