**# NEWSNUGGETS Application**

NEWSNUGGETS is a cohesive web-based application designed to analyze news articles using machine learning models. It integrates three key functionalities: News Article Sentiment Classification, News Article Category Classification, and News Article Summarization. Given a user's text input (a news article), NEWSNUGGETS provides sentiment analysis, categorization, and a concise summary of the content.

**## Project Structure**

- `Application/`: Main folder.

- `app.py`: Flask application that loads models and vectorizers, handles web requests and renders results.

- `models.py`: Contains classes for text preprocessing, vectorization, and summarization.

- `templates/`: Folder containing HTML templates for the user interface.

- `index.html`: The main page where users input the text of a news article.

- `result.html`: Displays the analysis results, including category, sentiment, and summary.

- `Pickle Files`: Stores pre-trained models and vectorizers.

- `tfidf\_vectorizer.pkl1`: TF-IDF vectorizer for category classification.

- `logistic\_regression\_model.pkl`: Model for category classification.

- `tfidf\_vectorizer\_sent.pkl1`: TF-IDF vectorizer for sentiment analysis.

- `logistic\_regression\_model\_sent.pkl`: Model for sentiment analysis.

- `news\_summarizer.pkl`: Summarization model.

**## Features**

- \*\*Sentiment Classification\*\*: Determines if the sentiment of the news article is positive or negative using logistic regression.

- \*\*Category Classification\*\*: Classifies the news article into predefined categories.

- \*\*Summarization\*\*: Generates a concise summary of the news article.

**## Prerequisites**

- Python 3.x

- Flask

- NLTK

- scikit-learn

- Pickle

**## Setup Instructions**

1. Ensure you have Python installed on your system.

2. Clone or download the NEWSNUGGETS application folder.

3. Navigate to the application directory:

**cd Application**

4. Install the required Python libraries:

**pip install Flask nltk scikit-learn pickle-mixin**

5. Make sure NLTK resources are downloaded:

**python -c "import nltk; nltk.download('stopwords'); nltk.download('punkt'); nltk.download('wordnet')"**

5. Run the application by executing the following command in your terminal:

**python app.py**

This will start a local web server. By default, the Flask app will be available at http://127.0.0.1:5000 in your web browser.

**## Using the Application**

- Open your web browser and navigate to http://127.0.0.1:5000.

- Enter the text of a news article into the provided text area.

- Submit the text to receive a sentiment analysis, category classification, and a summarized version of the article.

**## Technologies Used**

- \*\*Flask\*\*: Serves the web application and handles backend logic.

- \*\*NLTK\*\*: Used for text preprocessing and summarization techniques.

- \*\*scikit-learn\*\*: Implements machine learning models for text classification and vectorization.

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