Project Report:

Fake News Detector & Personal Voice Assistant

1. Fake News Detector Project (fake_news_detector.py)

This project is a Streamlit web application designed to classify news headlines as 'Real' or 'Fake' using a machine learning model.

A. Core Functionality

1. **Model Training & Evaluation**: Loads a dataset, trains a Logistic Regression model on news headline titles, and evaluates its performance on a test set.

2. **Single Headline Prediction**: Allows a user to input a headline for immediate real/fake classification and confidence scoring.

3. **Batch Prediction**: Enables the upload of a CSV file with a 'title' column for bulk classification, with results provided in a table and a downloadable CSV.

B. Key Technologies and Components

- **User Interface**: Streamlit is used to build the interactive web application.

- **Model**: LogisticRegression is the machine learning algorithm used for binary classification.

- **Vectorization**: TfidfVectorizer converts text headlines into numerical features using the TF-IDF method, excluding English stop words.

- **Explainability**: The eli5 library provides an explanation of the model's weights, showing the **Top Influential Words** that most strongly predict 'Real' or 'Fake'.

- **Data Handling**: pandas manages the data, including cleaning and label mapping.

2. Personal Voice Assistant Project (P1_Assistant.py)

This project is a command-line-based voice assistant that listens for voice commands and performs various utility tasks.

A. Core Functionality

Feature	Execution Detail
Speech I/O	Uses speech_recognition to take voice commands and pyttsx3 for voice output.
Time & Date	Announces the current time.
Jokes	Tells a random joke using pyjokes.
Weather	Fetches and reports the current temperature and description for a specified city (requires an OpenWeatherMap API key).
News	Fetches and speaks the top three news headlines (requires a News API key).
YouTube	Plays a specified song or video on YouTube using pywhatkit.
Reminders	Sets a **threaded reminder** for a task after a specified number of minutes, allowing the assistant to continue running.
Wikipedia	Provides a two-sentence summary for a given term.
Websites	Opens websites like Google, Gmail, and YouTube in the default browser using webbrowser.

B. Key Technologies and Components

- **Speech I/O**: speech_recognition (input) and pyttsx3 (output).

- **Concurrency**: The threading module is used to run the reminder function without blocking the main program loop.

- **Web Interaction**: requests for fetching API data (weather, news) and pywhatkit/webbrowser for opening web content.

- **APIs**: Integrates with OpenWeatherMap and a news API for real-time information.