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PROJECT REPORT

DAA Lab.

LEO – Personal Assistant

Submitted By:

- **Name :** Mohammad Aas Khan
- **Roll Number:** 22052646
- **Section:** CSE-41

Submitted To:

- **Instructor's Name:** Meghna G Raj Ma'am
- **Position:** ASSISTANT PROFESSOR
- **Department:** SCHOOL OF COMPUTER SCIENCE

Overview :-

Leo is a Python-based personal voice assistant designed to perform a variety of everyday tasks via voice commands. Named "Leo" to convey a helpful and intelligent persona, this assistant integrates essential functions like web searching, system management, entertainment control, and productivity features. Leo uses a modular design and supports various libraries to execute tasks efficiently and provide voice feedback to the user.

Leo includes functionalities like Google, YouTube, and Wikipedia search, app management, temperature and time checking, alarm setting, and more. The assistant is enhanced with voice output at every step using libraries like **pyttsx3, SpeechRecognition,** and **PyAudio.**

Requirements :-

- Operating System: Windows or Linux
- Python Version: 3.6 or later
- Memory: 1 GB (recommended for smooth performance)
- Storage: 100 MB

Language and Framework Details :-

- Python is the primary language for Leo, chosen for its simplicity and flexibility in handling automation, voice processing, and web requests.
- Various Libraries such as pyttsx3 for text-to-speech, SpeechRecognition for capturing voice commands, and requests for making web-based requests. Each of these components plays a key role in the assistant’s workflow and modular structure.

Libraries and Modules Used :-

The assistant uses a range of libraries to handle voice recognition, text-to-speech, web automation, system control, and more. Each library and module serves a specific purpose:

- **Core Libraries:**
  - **pyttsx3:** For converting text to speech, which is crucial for providing vocal feedback to the user.
  - **speech_recognition:** To recognize and interpret spoken commands from the user.
  - **requests:** To send HTTP requests, primarily used to fetch temperature data.
  - **bs4 (BeautifulSoup):** For parsing HTML responses from web searches (temperature checks).
  - **datetime:** To retrieve and format the current date and time.
  - **os:** Used for system-level commands, like shutting down or restarting the computer.
  - **pyautogui:** Allows automation of keyboard actions for controlling YouTube playback and adjusting volume.
  - **pycaw.pycaw:** A Python Core Audio Windows library for directly managing audio interfaces and controlling system volume.
  - **wikipedia:** Used to fetch summaries for quick information.
  - **webbrowser:** Opens URLs in the default web browser.
  - **pywhatkit:** Simplifies YouTube searches and playback.
  - **time:** Used for time-based functions and delays.

Directory Structure :-

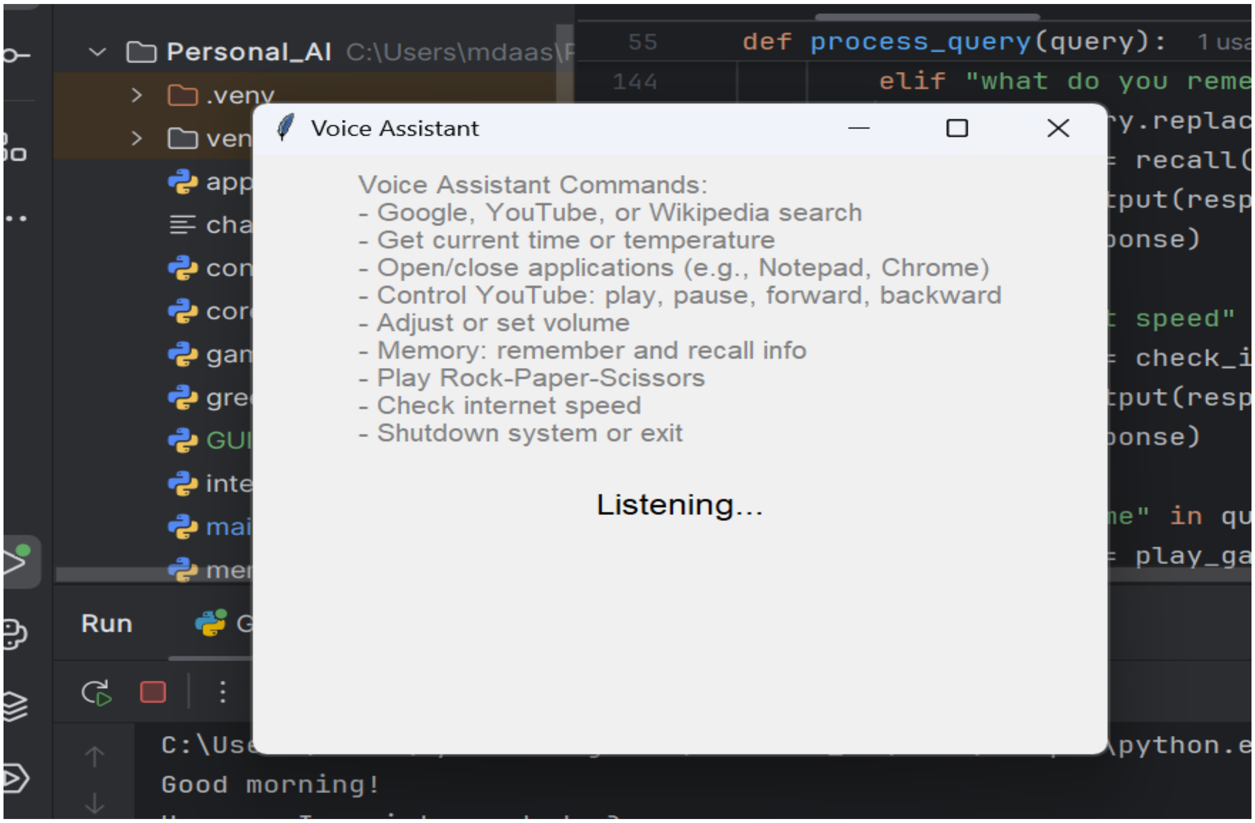
- **Leo_Personal_AI**

1	**main.py**	Main script to initialize and run Leo
2	**core_utils.py**	Combined configuration, speak, listen, and hotword detection
3	**conversation.py**	Conversation
4	**greet_user.py**	Greeting
5	**web_search.py**	Web search functions (Google, Wikipedia, YouTube)
6	**time.py**	Time check function

7	**temperature.py**	Temperature check
8	**app_management.py**	Open/close apps on PC
9	**youtube_control.py**	YouTube playback control (play, pause, etc.)
10	**Volume.py**	Volume UP and DOWN function
11	**memory.py**	Memory functions
12	**system_control.py**	System shutdown, restart, etc.
13	**internet_speed.py**	Internet speed check
14	**game.py**	Simple Rock-Paper-Scissors game

The project follows a modular design pattern, with separate Python files for each core function. This improves code readability and organization.

Key Functionalities



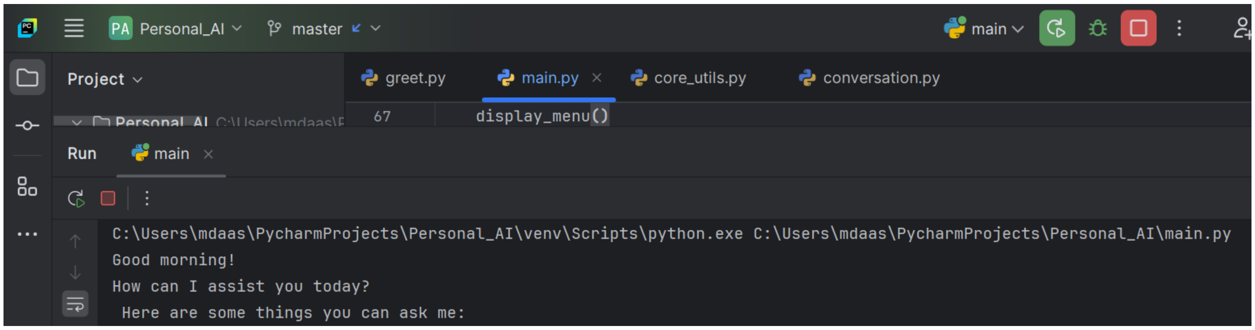
```
def process_query(query):
    elif "what do you reme
```

```
Voice Assistant Commands:
- Google, YouTube, or Wikipedia search
- Get current time or temperature
- Open/close applications (e.g., Notepad, Chrome)
- Control YouTube: play, pause, forward, backward
- Adjust or set volume
- Memory: remember and recall info
- Play Rock-Paper-Scissors
- Check internet speed
- Shutdown system or exit

Listening...
```

```
Good morning!
```

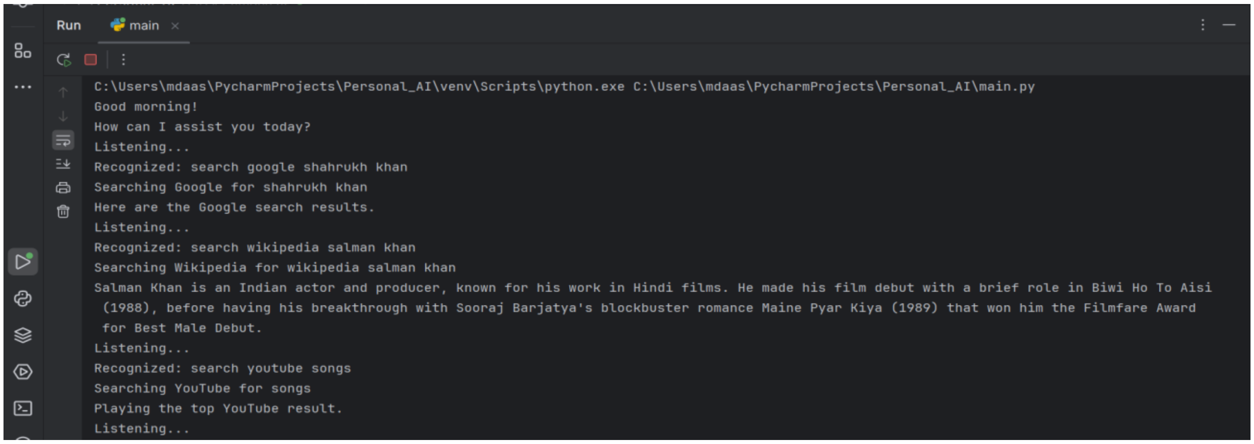
1. **Greeting User:**
    - Uses greet_user.py to welcome the user based on the time of day.
    - Invokes pyttsx3 to speak the greeting.



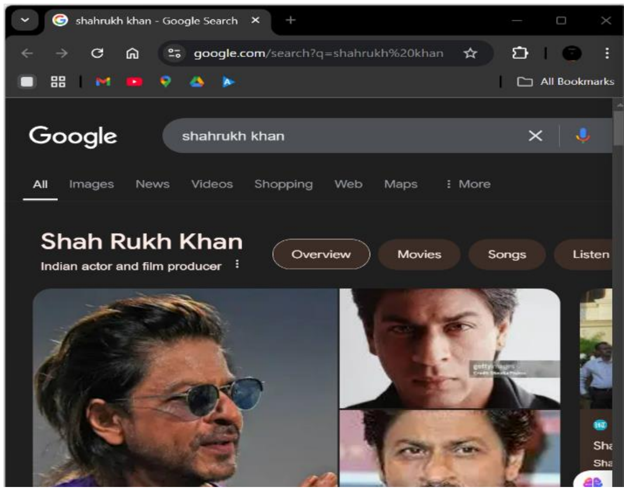
```
display_menu()
```

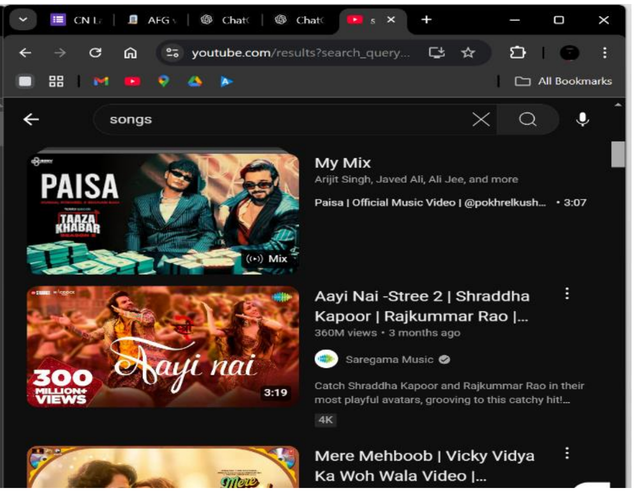
```
C:\Users\mdaas\PycharmProjects\Personal_AI\venv\Scripts\python.exe C:\Users\mdaas\PycharmProjects\Personal_AI\main.py
Good morning!
How can I assist you today?
 Here are some things you can ask me:
```

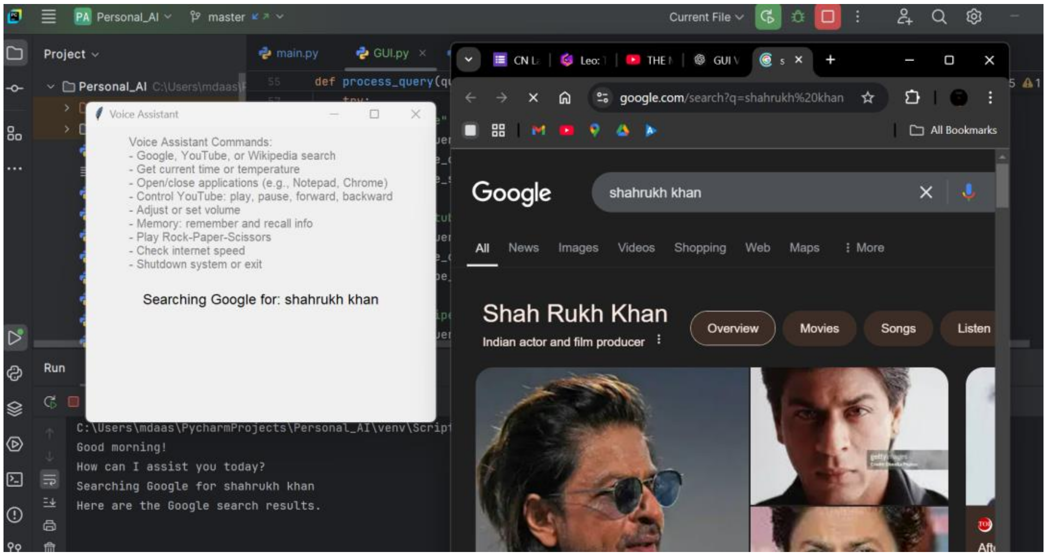
2. **Web Search:**
    - Google and YouTube Searches: Managed by google_search and youtube_search in web_search.py.
    - Wikipedia Search: Uses wikipedia to retrieve summaries.
    - Implementation: Uses webbrowser and pywhatkit for YouTube playback.



```
C:\Users\mdaas\PycharmProjects\Personal_AI\venv\Scripts\python.exe C:\Users\mdaas\PycharmProjects\Personal_AI\main.py
Good morning!
How can I assist you today?
Listening...
Recognized: search google shahrukh khan
Searching Google for shahrukh khan
Here are the Google search results.
Listening...
Recognized: search wikipedia salman khan
Searching Wikipedia for wikipedia salman khan
Salman Khan is an Indian actor and producer, known for his work in Hindi films. He made his film debut with a brief role in Biwi Ho To Aisi
 (1988), before having his breakthrough with Sooraj Barjatya's blockbuster romance Maine Pyar Kiya (1989) that won him the Filmfare Award
 for Best Male Debut.
Listening...
Recognized: search youtube songs
Searching YouTube for songs
Playing the top YouTube result.
Listening...
```




CN L
AFG
Chat(
Chat(
youtube.com/results?search_query...
All Bookmarks
songs
My Mix
Arijit Singh, Javed Ali, Ali Jee, and more
Paisa | Official Music Video | @pokhrelkush... • 3:07
PAISA
TAAZA KHABAR
Mix
Aayi Nai -Stree 2 | Shraddha Kapoor | Rajkummar Rao |...
360M views • 3 months ago
Saregama Music
Catch Shraddha Kapoor and Rajkummar Rao in their most playful avatars, grooving to this catchy hit!...
4K
300 MILLION+ VIEWS
Aayi nai
3:19
Mere Mehboob | Vicky Vidya Ka Woh Wala Video |...



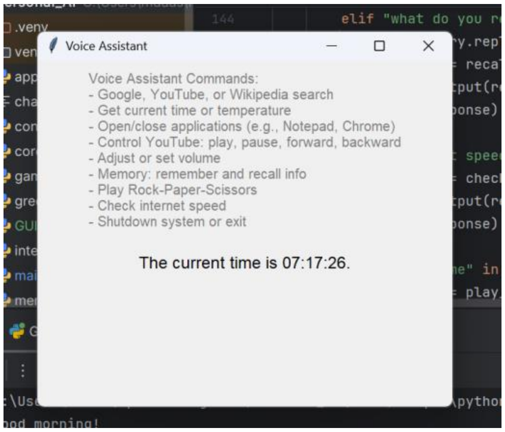
Voice Assistant

Voice Assistant Commands:
- Google, YouTube, or Wikipedia search
- Get current time or temperature
- Open/close applications (e.g., Notepad, Chrome)
- Control YouTube: play, pause, forward, backward
- Adjust or set volume
- Memory: remember and recall info
- Play Rock-Paper-Scissors
- Check internet speed
- Shutdown system or exit

Searching Google for: shahrukh khan

```
C:\Users\mdaas\PycharmProjects\Personal_AI\venv\Script
Good morning!
How can I assist you today?
Searching Google for shahrukh khan
Here are the Google search results.
```

3. **Time and Temperature Check:**
   - Time: Retrieves system time using datetime and formats it for vocal output.
   - Temperature: Fetches current temperature using requests and BeautifulSoup.



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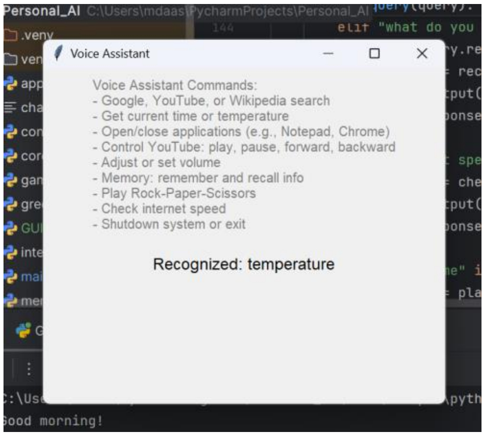
The current time is 07:17:26.



Voice Assistant

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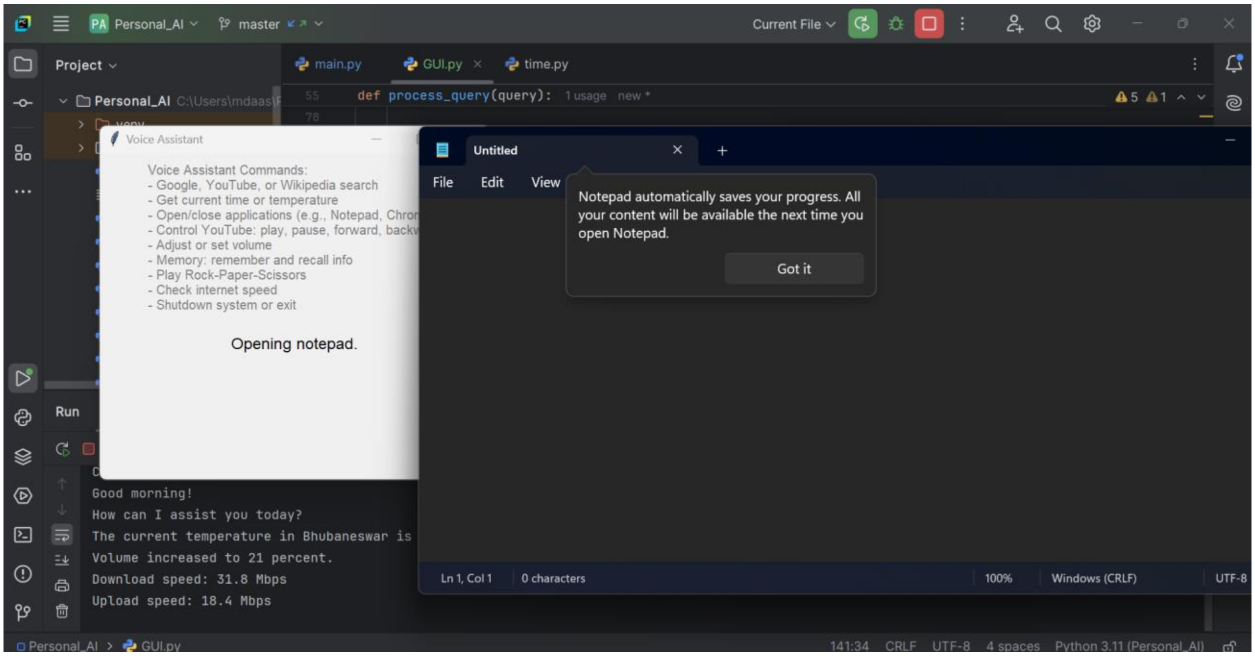
Recognized: temperature

4. **Application Management:**
   - Open and Close Apps: Runs system commands using os to open or close applications.



```
55    def process_query(query):
```

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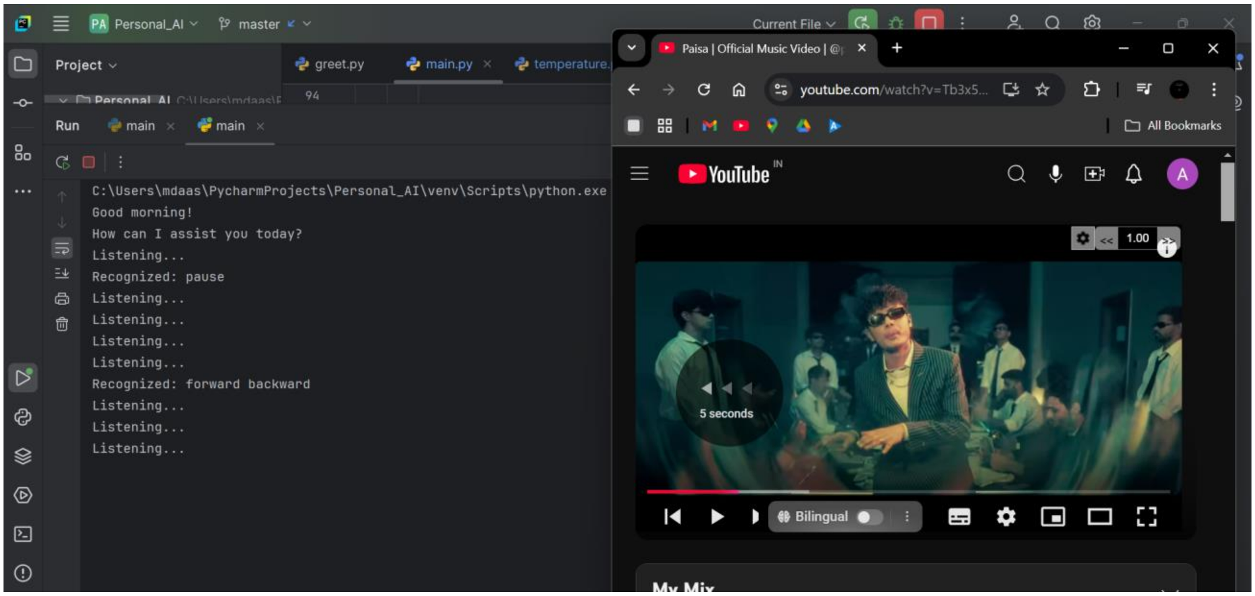
Opening notepad.

Notepad automatically saves your progress. All your content will be available the next time you open Notepad.

```
Good morning!
How can I assist you today?
The current temperature in Bhubaneswar is
Volume increased to 21 percent.
Download speed: 31.8 Mbps
Upload speed: 18.4 Mbps
```

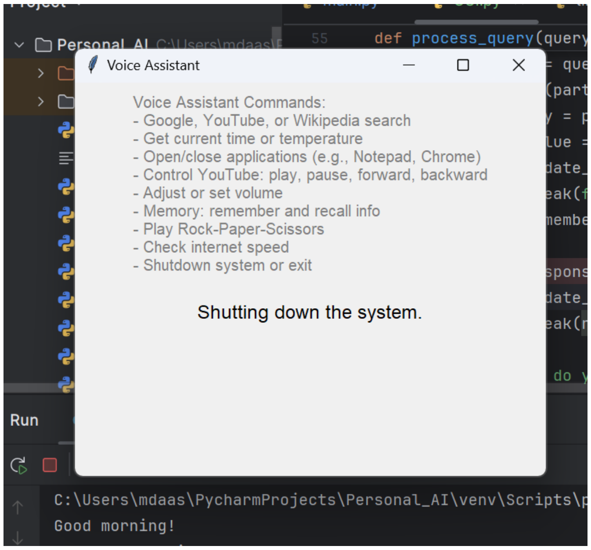
5. YouTube Control:

- Controls playback with keyboard shortcuts managed by pyautogui (play, pause, forward, backward).
- Volume adjustment is achieved by setting specific percentages through pyautogui.



```
C:\Users\mdaas\PycharmProjects\Personal_AI\venv\Scripts\python.exe
Good morning!
How can I assist you today?
Listening...
Recognized: pause
Listening...
Listening...
Listening...
Listening...
Recognized: forward backward
Listening...
Listening...
Listening...
```

6. **Memory Management:**
   - Uses memory.py to store and retrieve simple key-value memory data.
   - Uses dictionaries in Python for storing and recalling user-defined information.
7. **System Control:**
   - Shutdown and Restart: Uses system_control.py and os for system shutdown/restart.



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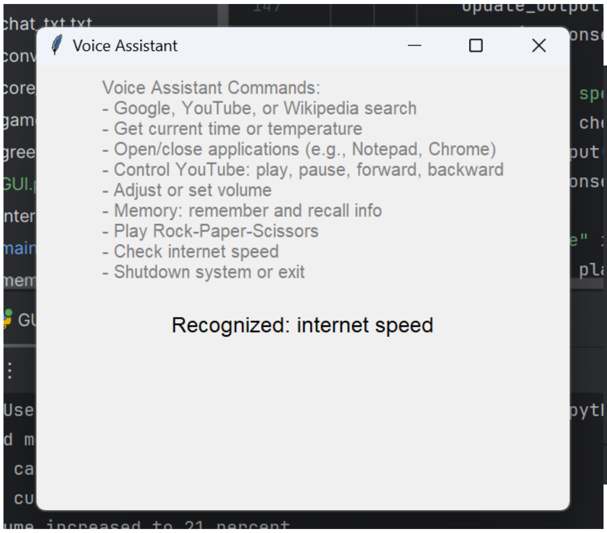
- Check internet speed
- Shutdown system or exit

Shutting down the system.

```
C:\Users\mdaas\PycharmProjects\Personal_AI\venv\Scripts\p
Good morning!
```

8. **Internet Speed Check:**
   - Uses speedtest library to check and announce internet speed.



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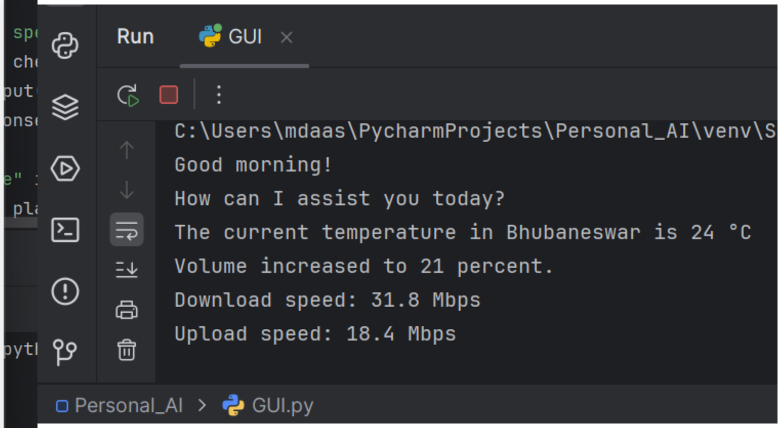
Recognized: internet speed

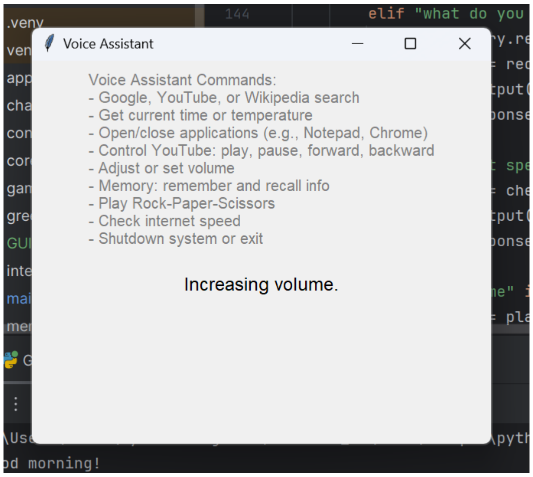


```
C:\Users\mdaas\PycharmProjects\Personal_AI\venv\S
Good morning!
How can I assist you today?
The current temperature in Bhubaneswar is 24 °C
Volume increased to 21 percent.
Download speed: 31.8 Mbps
Upload speed: 18.4 Mbps
```

9. **Game (Rock-Paper-Scissors):**
   - Implements a basic text-based Rock-Paper-Scissors game as a fun interaction.

10. Voice Control:

- Uses core_utils.py for recognizing voice input and giving voice feedback using speech_recognition and pyttsx3.



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- Play Rock-Paper-Scissors
- Check internet speed
- Shutdown system or exit

Increasing volume.
```

Conclusion

The Leo Assistant leverages several Python libraries for creating a multi-functional voice assistant capable of web searches, application management, and system control. The modular structure makes it highly maintainable and extendable, allowing new features to be easily integrated.

Leo provides a simple, voice-activated interface for performing essential tasks, making it a convenient tool for users looking for a basic voice-activated assistant on their PCs.