VIRTURAL ASSISTANCE USING PYTHON

A DESIGN PROJECT REPORT

Submitted by

NIKESHKUMAR T (811721104073)

SARATHY P (811721104090)

VIJAYAKUMAR S (811721104123)

in partial fulfillment for the award of the degree

of

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K. RAMAKRISHNAN COLLEGE OF TECHNOLOGY
(AUTONOMOUS)
SAMAYAPURAM – 621 112

BONAFIDE CERTIFICATE

Certified that this project report titled **"VIRTURAL ASSISSTANCE USING PYTHON"** is the Bonafide work of **NIKESH KUMAR T (811721104073), SARATHY P (811721104090), VIJAYAKUMAR S (811721104123),** who carried out the project under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE
Dr. A. DELPHIN CAROLINA RANI M.E, Ph. D.,
HEAD OF THE DEPARTMENT
PROFESSOR
Department of CSE
K. Ramakrishnan College of
Technology (Autonomous),
Samayapuram, Trichy – 621112.

SIGNATURE
Mr. DEVAN D.P M.E.,
SUPERVISOR
ASSISTANT PROFESSOR
Department of CSE
K. Ramakrishnan College of
Technology (Autonomous),
Samayapuram, Trichy – 621112.

Submitted for the viva-voce examination held on …….

INTERNAL EXAMINER **EXTERNAL EXAMINER**

DECLARATION

We jointly declare that the project report on **"VIRTURAL ASSISSTANCE USING PYTHON"** is the result of original work done by us and best of our knowledge, similar work has not been submitted to **"ANNA UNIVERSITY CHENNAI"** for the requirement of Degree of **BACHELOR OF ENGINEERING**. This project report is submitted on the partial fulfilment of the requirement of the award of Degree of **BACHELOR OF ENGINEERING**.

Signature

NIKESH KUMAR T

SARATHY P

VIJAYA KUMAR S

Place: Samayapuram

Date:

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ABSTRACT

The Virtual Assistance Using Python project stands as an innovative and multifaceted software solution, meticulously crafted to function as an intuitive and intelligent virtual assistant. Through harnessing the extensive capabilities inherent in the Python programming language and seamlessly integrating an array of pertinent libraries and APIs, this system is purpose-built to afford users an interactive and responsive platform.At its core, this project endeavors to furnish users with a sophisticated yet accessible avenue for executinga diverse spectrum of tasks, effortlessly accessing comprehensive information, and effectuating commands through the conduit of natural language interaction. By amalgamating cutting-edge technology with user-centric design, the virtual assistant aims to transcend traditional user-system interactions, fostering an environment of seamless communication and unparalleled utility. With anunwavering focus on precision and comprehensiveness, this document serves as the cornerstone for orchestrating the development, implementation, and validation phases of the virtual assistant system.-From encapsulating the intricacies of user authentication and natural language processing integration to articulating the nuances of data management, error handling, and system scalability, this SRS document meticulously dissects each facet, laying a definitive roadmap for the system's evolution. It meticulously outlines the system's ability to adapt to dynamic user needs, ensuring a seamless amalgamation of performance, security, reliability, usability, and maintainability.

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LIST OF ABBREVIATIONS

ABBREVIATIONS

API	-	Application Programming Interface
CLI	-	Command Line Interface
GUI	-	Graphical User Interface
IDE	-	Integrated Development Environment
PEP	-	Python Enhancement Proposal
PIP	-	Preferred Installer Program
PYPI	-	Python Package Index
URL	-	Uniform Resource Locator
VM	-	Virtual Machine

CHAPTER 1

INTRODUCTION

In the dynamic landscape of technological advancements, the integration of virtual assistants has become increasingly prevalent, offering users a sophisticated and intuitive means of interaction. Utilizing Python, a versatile and powerful programming language, in conjunction with machine learning opens up a realm of possibilities for creating intelligent virtual assistants. These digital entities are designed to comprehend natural language inputs, recognize user intentions, and execute tasks seamlessly. Python's rich ecosystem, encompassing robust libraries for Natural Language Processing (NLP) and machine learning, provides an ideal foundation for developing responsive and adaptive virtual assistants. This intersection of Python and machine learning facilitates the creation of assistants capable of understanding context, processing speech, and continuously learning from user interactions, ultimately enhancing user experiences across a diverse range of applications. As we delve into the intricacies of building a virtual assistant, the synthesis of Python and machine learning emerges as a dynamic force, driving innovation in the realm of human-computer interaction.

1.1 BACKGROUND

The emergence of virtual assistants represents a significant evolution in human-computer interaction, leveraging the power of Python programming and machine learning technologies. The background for virtual assistants using Python with machine learning is rooted in addressing the growing demand for intelligent, context-aware systems that can comprehend and respond to natural language inputs.

Python's prominence in the field stems from its versatility, extensive libraries, and ease of integration, making it an ideal language for developing sophisticated applications. In the context of virtual assistants, Python's Natural Language

Processing (NLP) capabilities, coupled with machine learning frameworks, provide the essential building blocks for understanding user queries, recognizing intents, and generating appropriate responses.

The background also reflects the increasing integration of machine learning algorithms to enhance virtual assistant capabilities. These algorithms enable the assistant to learn from user interactions, adapt to changing contexts, and continually improve its performance over time. The convergence of Python and machine learning empowers virtual assistants to go beyond simple rule-basedresponses, fostering a more intuitive and personalized user experience.

Moreover, the background of virtual assistants using Python with machine learning is shaped by advancements in speech recognition technologies. By incorporating speech-to-text capabilities, virtual assistants can seamlessly process voice commands, opening up new avenues for hands-free and natural interactions.

As technology continues to advance, the background for virtual assistants underscores a commitment to creating intelligent, adaptive systems that not only streamline tasks but also contribute to a more intuitive and user-centric computing experience. The synergy between Python and machine learning in this context represents a pivotal step in the evolution of virtual assistants, transforming them into indispensable tools for diverse applications in our interconnected

1.2 PROBLEM STATEMENT

In today's digital world, we need a virtual assistant that really understands and responds well to users. Many current assistants struggle with figuring out what users want and adapting to different conversations. The challenge is to create a virtual assistant using Python and machine learning that gets better at understanding natural language, recognizes speech accurately, and keeps up with changing conversations. This means building models that can recognize what users want and pick out important details, handling conversations smoothly, connecting with other services seamlessly, and always learning to improve. We also need to make sure it's secure, handles errors well, gets user feedback, and follows the rules. Solving this challenge involves creating a user-friendly, smart virtual assistant that works well and keeps getting better.

1.3 AIMS AND OBJECTIVES

1.3.1 AIM

Natural Language Understanding enable the virtual assistant to comprehend and interpret user queries in natural language. Develop the ability to recognize user intents, i.e., understand the tasks or actions users want the assistant to perform Provide users with the option to interact with the virtual assistant through voice commands. Create a coherent and context-aware conversation flow for a natural interaction with users. Assist users in performing tasks or retrieving information effectively.

1.3.2 OBJECTIVES

The objective of creating a virtual assistant using Python can vary based on individual needs and goals. However, the primary objectives typically include:

Automating Tasks: Building a virtual assistant to automate routine tasks, such as sending emails, fetching information from the web, setting reminders, managing calendars, etc.

Enhancing User Experience: Providing a more personalized and interactive experience for users by implementing natural language processing (NLP) to understand and respond to user queries or commands.

Information Retrieval: Allowing users to access information quickly and efficiently by fetching data from various sources or APIs based on their requests.

Integration with Services: Integrating the assistant with other services or APIs, like weather forecasts, news updates, traffic information, etc., to provide comprehensive assistance.

Learning and Improvement: Implementing machine learning techniques to improve the assistant's capabilities over time by learning from user interactions and feedback.

CHAPTER 2
LITERATURE SURVEY

2.1 TITLE AI-BASED VIRTUAL ASSISTANT USING PYTHON

AUTHOR: Patil Kavita Manojkumar, Aditi Patil, Sakshi Shinde, Shaktiprasad Patra, Saloni Patil

YEAR OF PUBLICATION: IEEE FEB 2023

ALGORITHM USED: Speech To Text through python & some libraries like Pyjokes, Pyaudio

ABSTRACT:

A software agent that will carry out tasks or provide services in response to a user\'s privately supported instructions or inquiries is known as an intelligent virtual assistant (IVA) or intelligent personal assistant (IPA). A virtual assistant capable of being accessed via web chat is sometimes called a \"chatbot.\" Online chat systems can occasionally only be used for amusement. Some virtual assistants are equipped to comprehend spoken language and answer with synthetic voices. Users can use voice commands to manage other basic chores like email, to-do lists, and calendars in addition to asking their assistants questions, controlling home automation devices, and controlling media playing. One of the best applications of artificial intelligence is the virtual personal assistant (VPA), which offers a new way for people to delegate tasks to machines. To create a Virtual Personal Assistant (VPA) and use it in various software applications, certain approaches and principles are used. To enable users to communicate with virtual assistants, speech recognition systems—also known as Automatic Speech Recognition, or ASR—play a crucial role.

MERITS: Efficiency, accuracy, data analysis

DEMERIT: Technical difficulties, dependency

2.2 TITLE VOICE ASSISTANT USING PYTHON

AUTHOR: Pooja C. Goutam, Monika S. Jalpure, Akshata S. Gavade, Pranjali Chaudhary

YEAR OF PUBLICATION: IEEE NOV 2022

ALGORITHM USED: Take voice commands from user. Display commands using speech- to text module

ABSTRACT:

In today's world we train our machine to think like humans and do their task by themselves and what human being can do are being replaced by machines. Based on this situation there comes concept of voice assistant capable of completing various ask for the humans based on their voice. Specific commands given by the user to virtual assistant is capable of filtering out the command and return relevant information [1].People in the whole world are transforming their digital experience using upcoming technologies like virtual reality, augmented reality, voice interaction etc. Voice control is emerging as new evolution in Human and Machine interaction where analog signal is converted by speech signal to digital wave. In Last few years huge increase in the use of smart phones led to the great use of voice assistant like Apple's Siri, Google's Assistant, Microsoft's Cortana and Amazon's Alexa etc. Voice assistants are built using technologies like voice recognition, speech synthesis, and Natural Language Processing (NLP) to provide indefinite applications to the users to make their life easy and comfortable..

MERIT: speed, lower false positive level and higher accuracy

DEMERIT: Bias, Inaccuracy, Technical issues

CHAPTER 3

SYSTEM SPECIFICATION

3.1 HARDWARE SYSTEM CONFIGURATION

- **Processor (CPU):** multi-core processor(Quad-core or higher (e.g., Intel Core i5/i7, AMD Ryzen 5/7))
- **Memory (RAM):** Adequate RAM is crucial for handling large datasets and complex machine learning models(16 GB or higher)
- **Storage (SSD):** 256 GB SSD or larger for the operating system and applications
- **Graphics Processing Unit (GPU):** GPUs are crucial for accelerating deep learning tasks.(NVIDIA GeForce GTX 1060 or higher for entry-level)
- **Networking:** Gigabit Ethernet for fast network connectivity.
- **Operating System (OS):** Linux distributions (e.g., Ubuntu, CentOS) are often preferred for machine learning tasks**.** Windows can also be used, but Linux is recommended for better compatibility with some ML frameworks.

3.2 SOFTWARE SYSTEM CONFIGURATION:

- **Python programming language -** Python 3.x installed on the computer/server
- **Operating system** - Windows, Linux, or macOS.
- **Python libraries -**such as – NLTK, numpy, pandas, tensorflow or PyTorch, Scikit-learn, Speech Recognition, Rasa, PyDub, Matplotlib and Seaborn, Requests, Beautiful Soup.
- **Version Control** – Git
- **SSL/TLS for web applications-** Implement security measures
- **Integrated Development Environment (IDE):** Use a Python-friendly IDE for development. Recommended: PyCharm, Jupyter Notebooks, VS Code.

3.3 SOFTWARE DESCRIPTION

A virtual assistant with machine learning capabilities using Python typically involves a combination of natural language processing (NLP), machine learning models, and various libraries to create an intelligent conversational interface.

3.3.1 LIBRARY

To develop the virtual Assistant with machine learning using python, the following libraries are commonly used:

1. **NLTK (Natural Language Toolkit):** NLTK is a powerful library for working with human language data. It provides tools for tasks such as tokenization, stemming, tagging, parsing, and more.
2. **SpaCy:** SpaCy is another popular library for NLP tasks. It is known for its speed and efficiency, making it suitable for real-time applications. SpaCy provides pre-trained models for various languages.
3. **TensorFlow or PyTorch:** These are deep learning frameworks used for building and training neural networks. TensorFlow and PyTorch are widely used for natural language understanding and other machine learning tasks.
4. **Scikit-learn:** Scikit-learn is a versatile machine learning library that provides simple and efficient tools for data analysis and modeling. It includes various algorithms for classification, regression, clustering, and more.
5. **Speech Recognition:** The Speech Recognition library allows your virtual assistant to perform speech recognition. It supports multiple speech engines and APIs.

6. **Rasa:** Rasa is an open-source platform for building conversational AI. It provides tools for natural language understanding, dialogue management, and integration with messaging platforms.
7. **PyDub:** PyDub is a library for audio processing in Python. It can be useful for handling audio files and performing tasks like converting file formats, cutting, and concatenating audio.
8. **Pandas:** Pandas is a data manipulation library that provides data structures for efficiently storing and manipulating large datasets. It is commonly used for data preprocessing.
9. **NumPy:** NumPy is a fundamental library for scientific computing in Python. It provides support for large, multi-dimensional arrays and matrices, along with mathematical functions to operate on these arrays.
10. **Matplotlib and Seaborn:** These libraries are used for data visualization. They can be helpful in creating charts and graphs to present information in a user-friendly way.
11. **Requests:** The Requests library is used for making HTTP requests, which can be beneficial for integrating your virtual assistant with external services and APIs.
12. **Beautiful Soup:** Beautiful Soup is a library for web scraping. If your virtual assistant needs to extract information from websites, Beautiful Soup can be useful for parsing HTML and XML documents.

3.3.2 Developing Environment

Creating a development environment for a virtual assistant using Python with machine learning involves setting up the necessary tools, libraries, and frameworks. Below is a step-by-step guide to help you establish a development environment. Python is the primary programming language used fordeveloping the system. Ensure that Python is installed on your system.

1. **Integrated Development Environment (IDE):** Choose an IDE for Python development, such as PyCharm, Visual Studio Code, or Jupyter Notebook. These IDEs provide features like code editing, debugging, and project management, enhancing the development process

2. **Install Required Libraries:** Use the Python package manager, pip, to install the necessary libraries such as OpenCV, NumPy, TensorFlow or PyTorch, and Flask. You can install them using the command line interface or directly within your IDE.

3. **Create a Virtual Environment:** Open a terminal or command prompt and navigate to your project directory.

Run the following commands to create a virtual environment:# On Windows

python -m venv

On

macOS/Linux

python3 -m venv

4. **Activate the Virtual Environment:**

 # On Windows.\venv\Scripts\activate
 # On macOS/Linux source venv/bin/activate

1. **Install Required Libraries:**

pip install nltk spacy tensorflow scikit-learn speechrecognition flask pandasmatplotlib seaborn

2. **Download SpaCy Models:**

python -m spacy download en_core_web_sm

3. **Choose a Machine Learning Framework:**

#TensorFlopip install tensorflow
For PyTorch (Visit the official PyTorch website for specific instructions)

4. **Install Rasa:**

pip install rasa5.Set Up a Version Control System:

git init

5. **Test Your Virtual Assistant:**

Write unit tests to ensure the functionality of individual components.Usetesting frameworks like pytest**.**

By following these steps, you'll have a well-organized and functional development environment for building a virtual assistant using Python with machine learning. Adjust the tools and libraries based on your specific project requirements and preferences.

CHAPTER 4

SYSTEM ANALYSIS

4.1 EXISTING SYSTEM

The deep learning algorithm identifies all the faces in the image, extracts the invariant features of each face. The invariant feature of the face is studied to compute the emotions. The model captures the friends list of the user and securely shares the image to the known persons in the image. The main purpose of this project is to enhance the relationship between the student and the teaching staff. Due to pandemic every student are forced to attend the online classes, even though some students are tend to bunk the classes by attending those session by use some other else. The algorithm depends on various factors such as accuracy, speed, and complexity of an existing system.

ALGORITHM USED:

1. **Speech Recognition:** Deep learning models like Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs) are commonly used for speech recognition. Libraries like Speech Recognition in Python make it easy to integrate existing models.

2. **Natural Language Processing (NLP):** Algorithm: Natural Language Processing is crucial for understanding and processing user queries. Techniques include tokenization, part-of-speech tagging, named entity recognition, and sentiment analysis. Popular libraries include NLTK, spaCy, and the Hugging Face Transformers library for advanced NLP tasks.Model: Pre-trained language models like OpenAI's GPT (Generative Pre-trained Transformer) or BERT (Bidirectional Encoder Representations from Transformers) can be fine-tuned for specifictask

3. Intent Recognition:

Algorithm: Intent recognition helps identify the user's intent based on their input. You can use machine learning models, such as support vector machines (SVM), decision trees, or deep learning models, depending on the complexity of the task.

Model: Many use pre-trained models or train custom models based on their specific needs.

4. Dialog Management:

Algorithm: Finite State Machines (FSM) or more advanced approaches like Reinforcement Learning can be used for dialog management. Reinforcement Learning can help the virtual assistant learn to make better decisions over time based on user feedback.

Model: For RL, you might use frameworks like OpenAI Gym or implementcustom solutions.

5. Response Generation:

Algorithm: Depending on the complexity, response generation can range from rule-based systems to advanced generative models. For simple cases, templates or rule-based approaches might be sufficient. For more sophisticated responses, you can use generative models like GPT.

Model: Pre-trained language models or custom-trained models can be employed.

4.1.1 DRAWBACKS+

- Data Privacy and Security Concerns
- Limited Understanding of Context
- Dependency on Internet Connectivity
- Overreliance on Pre-trained Models
- Limited Multimodal Capabilities
- High Development and Maintenance Costs

4.2 PROPOSED SYSTEM

Our proposed voice assistant system employs a Speech Recognition library for seamless user command understanding. By converting spoken words into text, the assistant interprets commands, utilizing underlying algorithms to identify keywords and execute corresponding actions.To enrich user interaction, Text-to-Speech functions allow the assistant to respond audibly. We've integrated APIs like WOLFRAMALPHA for calculations and web searches, and others for tasks like fetching news from the web.

For system-related actions such as shutdown or restart, the OS library is employed. Our system ensures a user-friendly experience, combining Speech Recognition, Text-to-Speech, and APIs for efficient and diverse functionalities.code for virtual assistan ai Front end

ADVANTAGES:

- Flexibility and Extensibility:
- Large Community and Open Source Ecosystem
- Availability of Pre-trained Models
- Rich Set of Machine Learning Libraries
- Community Support for AI and ML
- Scalability and Performance

CHAPTER 5

ARCHITECTURAL DESIGN

5.1 SYSTEM DESIGN

A system architecture is the conceptual model that defines the structure, behavior, and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviors of the system.

To build a virtual assistant in Python with machine learning, start with a user-friendly interface. Make it understand spoken words using speech recognition and interpret language using natural language processing. Teach it to recognize user intentions with a machine learning model. Create a system to manage conversations and store information. Develop modules to perform tasks like fetching weather information. Ensure it handles errors well and keeps user data secure. Connect it with external services for more capabilities. Continuously improve by training the machine learning model based on user interactions. Keep it simple, deploy it, and gather feedback for ongoing enhancements.

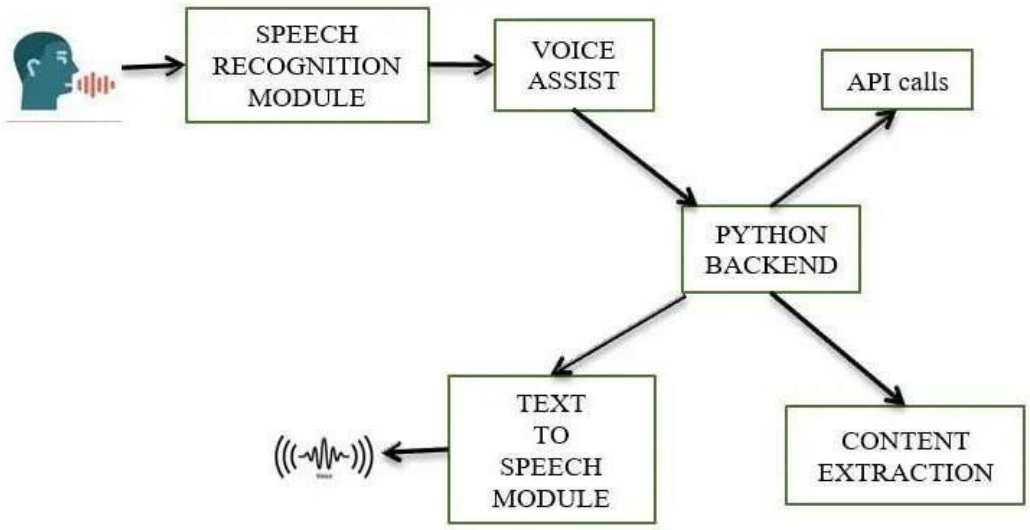


Fig 5.1 System Architecture

5.1 DATA FLOW DIAGRAM

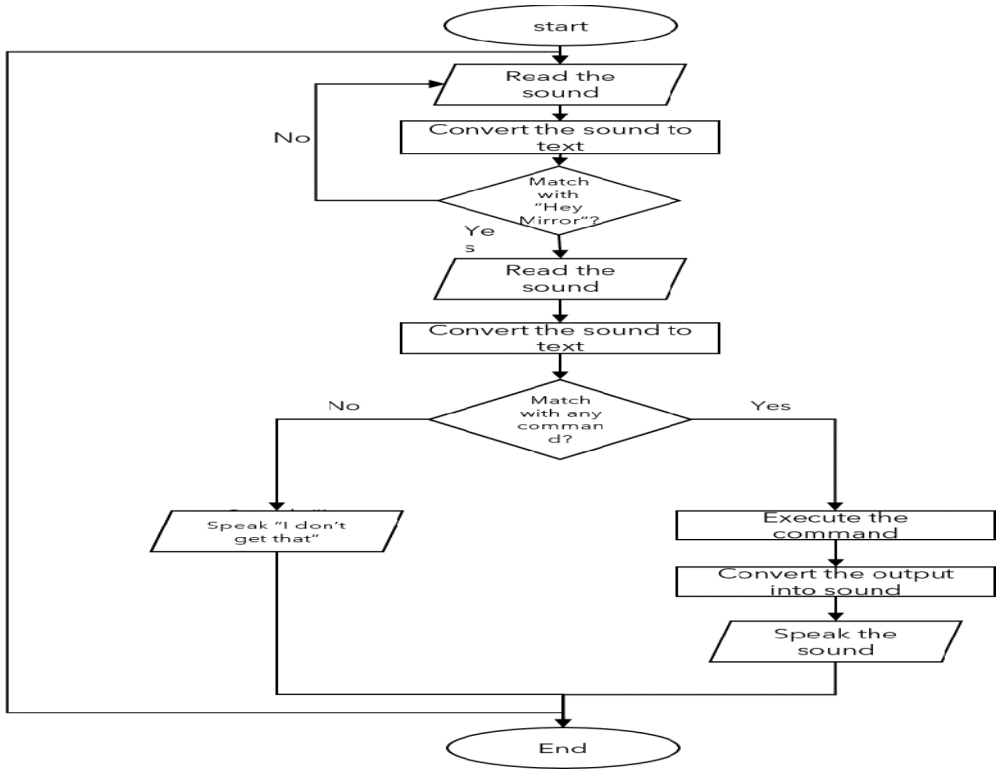


Fig 5.2 Data Flow Diagram

5.2 USE CASE DIAGRAM:

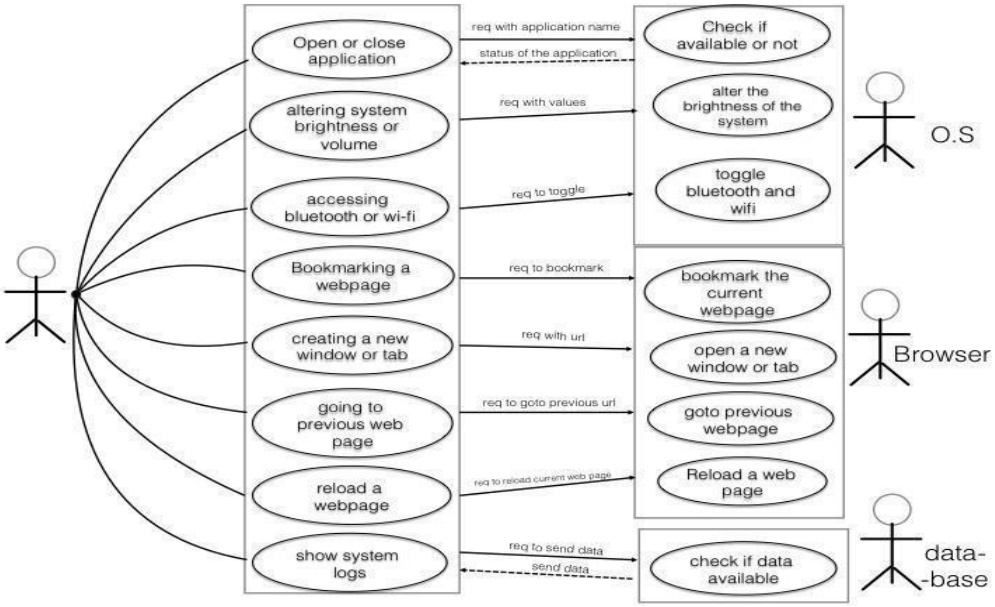


Fig 5.3 Use Case Diagram

5.3 ACTIVITY DIAGRAM

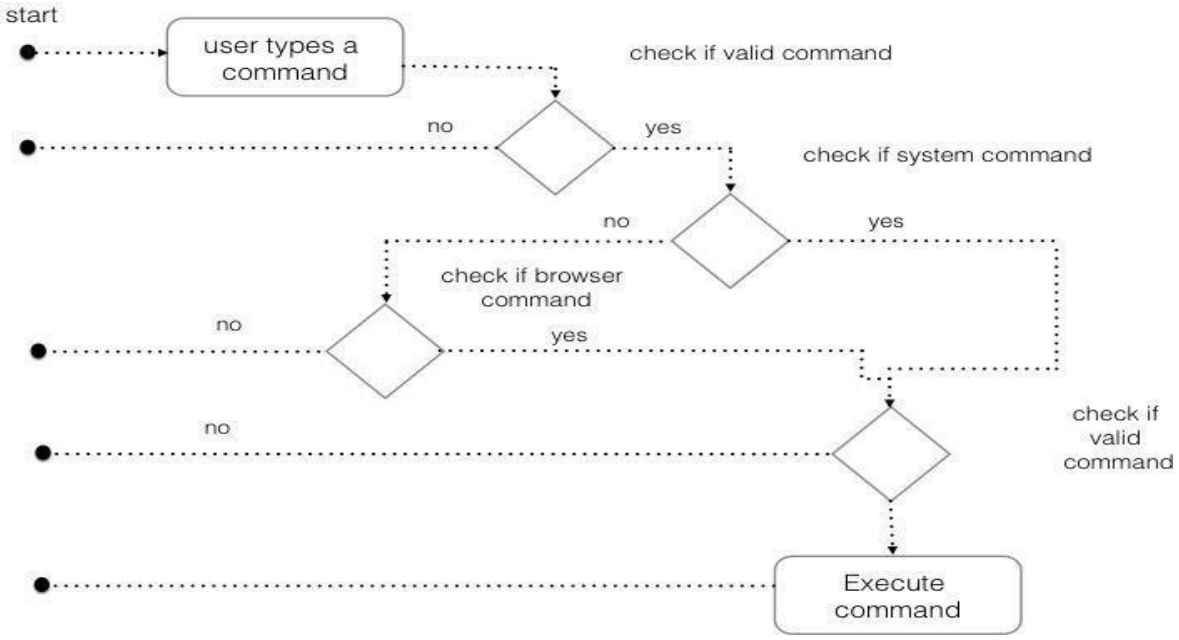


Fig 5.4 Activity Diagram

5.4 SEQUENCE DIAGRAM

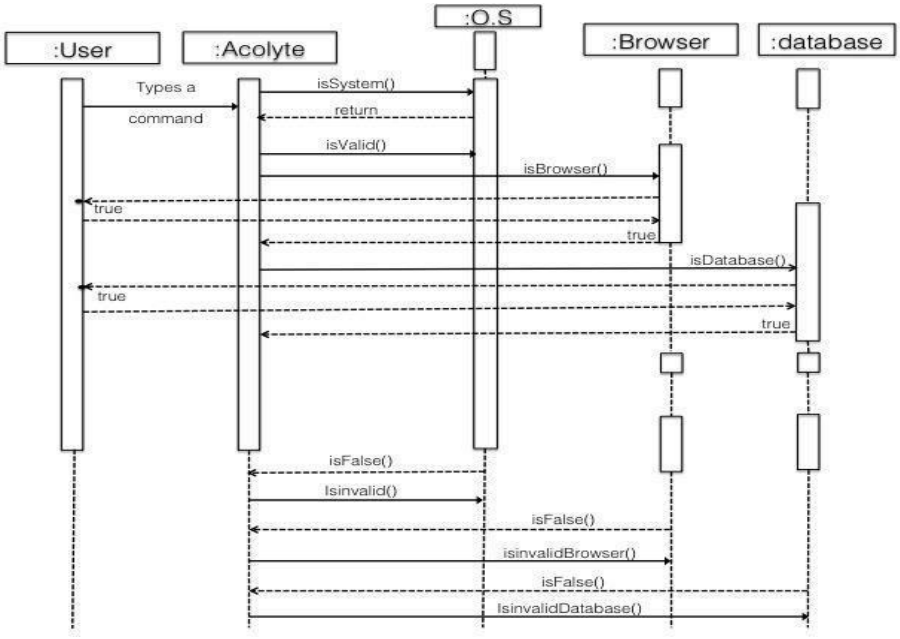


Fig 5.5 Sequence Diagram

CHAPTER 6

MODULE DESCRIPTION

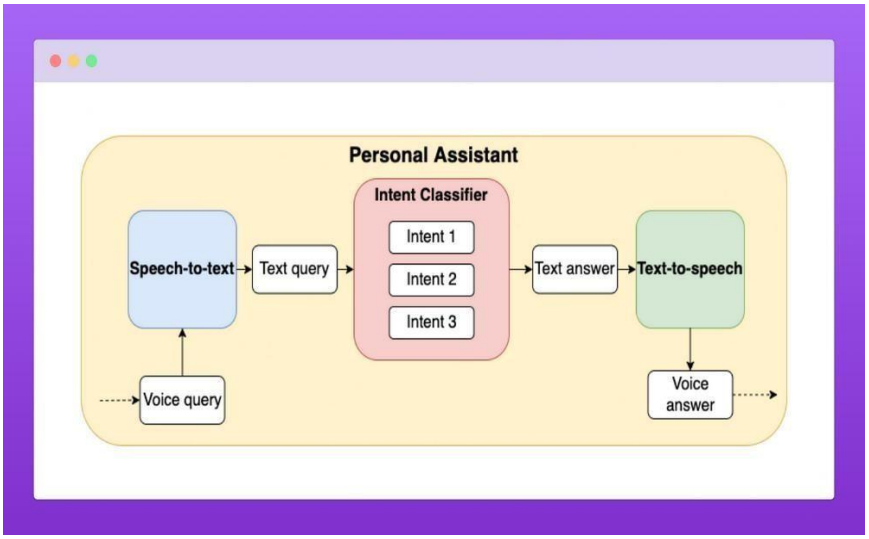


Fig 6.1 Phases Of Proposed System

6.1 TEXT QUERY

Building a text query virtual assistant using Python with machine learning involves integrating natural language processing (NLP) and machine learning models to understand and respond to user queries.

6.2 INTENT CLASSIFIER

Implementing an intent classifier in a virtual assistant using Python with machinelearning involves training a model to understand the user's intent based on their input text.

6.3 SPEECH TO TEXT

Building a Speech-to-Text (STT) feature in a virtual assistant using Python typically involves integrating a speech library to convert spoken language into written text. Below, I'll outline the steps to create a simple Speech-to-Text virtual assistant using the SpeechRecognition library in Python.

1. Face Alignment (Optional): Align the detected faces to a standardized position, which helps improve the accuracy of face recognition or feature extraction. Techniques like facial landmarks detection or affine transformations can be used for face alignment.

2. Face Recognition: Perform face recognition on the detected faces to identify individuals. This involves comparing the extracted facial features with a pre-existing database of known faces. Machine learning techniques like deep learning-based face recognition models (e.g., Face Net, VG G Face) or traditional methods like eigenfaces or Fisher faces can be used for this task.

6.4 WEB INTERFACE MODULE

Flask allows to create web applications and interfaces, it provides the necessary tools and components to build a web interface, handle HTTP requests and responses, manage routing, and generate dynamic HTML content. It interacts with the face detection and recognition modules and pass them to the prediction modulefor face recognition

- Develop a user-friendly web interface using the Flask framework and Design the necessary HTML templates and CSS stylesheets for the interface.
- Implement routes and views for different functionalities (e.g., capturingattendance, displaying attendance records).
- Integrate the face detection, recognition, and attendance logging modules with theFlask application.

6.5 INFO PREDICTION MODULE

The Info/data Prediction module utilizes the face detection, recognition and web interface modules results to predict the identity of each detected face. Here are the key tasks involved in the Info Prediction module:

1. **Face Embeddings:** After recognizing a face, extract its facial features using a pre-trained model. These embeddings capture unique characteristics of each face and can be used for comparison or classification.

2. **Classification:** Train a classifier (e.g., Support Vector Machines, k-Nearest Neighbors, or deep learning models) on a labeled dataset of face embeddings. The classifier should be able to predict the identity of a face based on its embeddings.

3. **Attendance Tracking:** Maintain a record of the recognized faces and their attendance status. You can store this information in a database or file for further analysis.

6.6 RELATION MODULE

The database module would be responsible for storing attendance records, student information, and any other relevant data. It would allow the system to efficiently manage and query attendance data for generating reports, tracking student attendance, and performing analysis.

The database module may utilize a relational database management system (RDBMS) such as MySQL, PostgreSQL, or SQLite. The module would provide a set of APIs or functions to interact with the database, allowing the system to insert, update, delete, and retrieve data as needed.

The module would handle tasks such as creating database tables for storing attendance records, managing user authentication and access control, and ensuring data integrity and security

CHAPTER 7

CONCLUSION & FUTURE SCOPE

7.1 CONCLUSION

In conclusion, the development of a virtual assistant imbued with machine learning capabilities using Python represents a transformative and robust solution, elevating user interactions and streamlining diverse tasks with finesse. Python's expansive ecosystem, fortified by cutting-edge machine learning libraries and adept graphical user interface (GUI) frameworks, assumes pivotal roles in sculpting an intricately woven, intelligent conversational interface.

The journey begins with Python's Natural Language Processing (NLP) prowess, harnessed through libraries like spa Cy, NLTK, and advanced models such as GPT and BERT. This linguistic finesse empowers the virtual assistant to not just comprehend but to intelligently respond to user queries with a level of nuance that mimics human interaction.

Python's malleability and expansiveness shine through in its ability to seamlessly integrate a plethora of machine learning frameworks, including but not limited to TensorFlow and PyTorch. This flexibility grants developers the latitude to experiment with diverse models and algorithms, rining and amplifying the virtual assistant's cognitive capabilities.

7.2 Future Scope

The future scope for virtual assistants with machine learning using Python is vast and promising, driven by ongoing advancements in natural language processing (NLP), machine learning (ML), and the broader field of artificial intelligence (AI). Here are several key areas that indicate the future trajectory of virtual assistants.

Enhanced Natural Language Understanding:

Future virtual assistants will exhibit a more nuanced and context-aware understanding of natural language. Advanced NLP models and techniques, possibly leveraging transformer architectures or even more sophisticated models, will contribute to improved language comprehension.

Conversational AI in Multimodal Environments:

The integration of multimodal capabilities, incorporating text, speech, images, and possibly even video, will redefine the user experience. Virtual assistants will seamlessly transition between various modes of interaction, providing a more comprehensive and natural conversational interface.

Improved Personalization:

The future holds the promise of highly personalized virtual assistants that adapt to individual user preferences, behavior, and contextual cues. ML algorithms will become more adept at learning from user interactions, offering tailored responses and services.

Integration with IoT Devices:

Virtual assistants will increasingly become integral components of the Internet of Things (IoT) ecosystem. They will seamlessly interact with smart devices, environments. Continuous Learning and Adaptation Future virtual assistants will exhibit continuous learning capabilities, adapting not only to changing user preferences but also evolving linguistic patterns and cultural nuances. They will leverage reinforcement learning and other adaptive techniques to improve over time. incorporate machine learning algorithms that can adapt to various classroom settings and optimize attendance tracking in real- time, further enhancing its functionality.

APPENDIXA(PROJET CODE)

```
import speech_recognition as sr # recognise speech
import webbrowser # open browser
import time
import playsound # to play an audio file
import random
import os
def there_exists(terms):
        if term in voice_data:
            return True


r = sr.Recognizer() # initialise a recogniser
# listen for audio and convert it to text:
def record_audio(ask=False):


    with sr.Microphone() as source: # microphone as source
        r.energy_threshold=500            #voice level number increse more sensitive
        r.adjust_for_ambient_noise(source,1.2)# noise cancel rate
        r.pause_threshold= 1
        if ask:
            speak(ask)
        audio = r.listen(source)  # listen for the audio via source
```

```
    voice_data = ''


    try :
        voice_data = r.recognize_google(audio)  # convert audio to text


    except sr.RequestError:
speak('Sorry, the service is down') # error: recognizer is not connectedexcept
    sr.UnknownValueError: # error: recognizer does not understand with
    sr.Microphone() as source: # microphone as source
    r.energy_threshold=500            #voice level number increse more sensitive
    r.adjust_for_ambient_noise(source,1.2)# noise cancel rate
    r.pause_threshold= 1
    if ask:
        speak(ask)


        audio = r.listen(source)  # listen for the audio via source
    except sr.UnknownValueError: # error: recognizer does not understand
        print('Recognizing..')
print(f">> {voice_data.lower()}") # print what user saidreturn
# 2: name
if there_exists(["your name","what i call you","what is your good name"]):
    name= record_audio("my name is Vavo stand for virtual assistance version
One. what's your name?")
```

```
print('Recognizing..')
            print(f">> {voice_data.lower()}") # print what user said
            return voice_data.lower()

        # get string and make a audio file to be played
        def speak(audio_string):
            tts = gTTS(text=audio_string, lang='en-in') # text to speech(voice)
            r = random.randint(1,20000000)
            audio_file = 'audio-' + str(r) + '.mp3'
            tts.save(audio_file) # save as mp3
            playsound.playsound(audio_file) # play the audio file
            print(audio_string) # print what app said
            os.remove(audio_file) # remove audio file

        def respond(voice_data)
              # 1: greeting
            if there_exists(["hey","hi","hello","wake up","hai"]):
                greetings = ["hey", "hey, what's up? ", " how can I help you","I'm
        listening","hello"]
                greet = greetings[random.randint(0,len(greetings)-1)]
                speak(greet)

                except sr.RequestError:
                    speak('Sorry, the service is down') # error: recognizer is not connected
```

```
        except sr.UnknownValueError: # error: recognizer does not understand
            print('Recognizing..')
        print(f">> {voice_data.lower()}") # print what user said
        return voice_data.lower()


    # 2: name
    if there_exists(["your name","what i call you","what is your good name"]):
        name= record_audio("my name is Vavo stand for virtual assistance version One. what's your name?")
        speak('Nice to meet you '+ name )
        speak('how can i help you ' + name)


    # 3: Origin
    if there_exists(["who are you","your inventor","invented you","created you","who is your developer"]):
        greetings = ["I am Virtual Voice Assistant","I am developed by vijaya kumar,sarathy, mukunthan s  as a voice assistance"] # You can Add your name
        greet = greetings[random.randint(0,len(greetings)-1)]
        speak(greet)


    if there_exists(["what is your age","how old are you","when is your birthday"]):
        greetings = ["I came into this world in march 2023"]
        greet = greetings[random.randint(0,len(greetings)-1)]
```

```
        speak(greet)

        except sr.RequestError:
            speak('Sorry, the service is down') # error: recognizer is not connected
        except sr.UnknownValueError: # error: recognizer does not understand
            print('Recognizing..')
        print(f">> {voice_data.lower()}") # print what user said
        return voice_data.lower()


    # 3: Take care's
    if there_exists(["how's everything" ,"how ia everything","how are you","how are you doing","what's up","whatsup"]):
        greetings = ["I am well ...thanks for asking ","i am well" ,"Doing Great" ]
        greet = greetings[random.randint(0,len(greetings)-1)]
        speak(greet)


    # 3: greeting
    if there_exists(["What are you doing" ,"what you doing","doing"]):
        greetings = ["nothing", "nothing...,just working for you","Nothing much"]
        greet = greetings[random.randint(0,len(greetings)-1)]
        speak(greet)

        except sr.RequestError:
```

```
            speak('Sorry, the service is down') # error: recognizer is not connected
        except sr.UnknownValueError: # error: recognizer does not understand
            print('Recognizing..')
        print(f">> {voice_data.lower()}") # print what user said
        return voice_data.lower()



        # 4.1: time
    if there_exists(["what's the time","tell me the time","what time is it","what is the time","time is going on"]):
        time = ctime().split(" ")[3].split(":")[0:2]
        if time[0] == "00":
            hours = '12'
        else:
            hours = time[0]
        minutes = time[1]
        time = f'{hours} {minutes}'
        speak(time)


        # 5: search wekiapedia
    if there_exists(["wikipedia"]):
        search = record_audio('What do you want to search for?')
        url = 'https://en.wikipedia.org/wiki/'+ search
        webbrowser.get().open(url)
```

```
        speak('Here is what I found for' + search)


    # 5: search
    if there_exists(["do google","search google","on google","search for","in google"]):
        search = record_audio('What do you want to search for?')
        url = 'https://google.com/search?q='+ search
        webbrowser.get().open(url)
        speak('Here is what I found for' + search)
      # 5.6: opening youtube
    if there_exists(["open the youtube","open youtube"]):
        url = 'https://www.youtube.com/'
        webbrowser.get().open(url)
        speak('Opening')


      # 5.7: opening google
    if there_exists(["open the  google","open google"]):
        url = 'https://www.google.com/'
        webbrowser.get().open(url)
        speak('Opening')
         # 5.7: opening gemail
    if there_exists(["open gmail","open email","open my email","check email"]):
        url = 'https://mail.google.com/'
        webbrowser.get().open(url)
```

```
        speak('Opening')
    # 5.5: find location
    if there_exists(["location"]):
        location = record_audio('What is the locatio n?')
        url = 'https://google.nl/maps/place/' + location + '/&amp;amp;'
        webbrowser.get().open(url)
        speak('Opening map of' + location )
    # 6: search youtube
    if there_exists(["search youtube","search the youtube","search in youtube","in youtube","on youtube"]):
        search = record_audio('What do you want to search for?')
        r.pause_threshold=2
        url =  'https://www.youtube.com/results?search_query='+search
        webbrowser.get().open(url)
        speak('Here is what I found')
        #OS shutdown
    if there_exists(["shutdown system","system off","shutdown the system","system shutdown"]):
        speak('Okay system will off in 30 seconds')
        os.system("shutdown /s /t 30")


    if there_exists(["good","thank you","thanks","well done"]):
      greetings = ["my pleasure","Don't mention","Thanks for your compliment","No problem.","Thank you, it makes my day to hear that."]
```

```
        greet = greetings[random.randint(0,len(greetings)-1)]
        speak(greet)


    if there_exists(["exit", "quit","sleep","shut up","close"]):
        greetings = ["Going offline ! you can call me Anytime","Okay ,you can call me Anytime","See you later","See you soon","Have a good day."]
        greet = greetings[random.randint(0,len(greetings)-1)]
        speak(greet)
        exit()
    # 5: search
    if there_exists(["do google","search google","on google","search for","in google"]):
        search = record_audio('What do you want to search for?')
        url = 'https://google.com/search?q='+ search
        webbrowser.get().open(url)
        speak('Here is what I found for' + search)
      # 5.6: opening youtube
    if there_exists(["open the youtube","open youtube"]):
        url = 'https://www.youtube.com/'
        webbrowser.get().open(url)
        speak('Opening')


      # 5.7: opening google
    if there_exists(["open the  google","open google"]):
```

```
        url = 'https://www.google.com/'
        webbrowser.get().open(url)
        speak('Opening')
         # 5.7: opening gemail
    if there_exists(["open gmail","open email","open my email","check email"]):
        url = 'https://mail.google.com/'
        webbrowser.get().open(url)
        speak('Opening')
    # 5.5: find location
    if there_exists(["location"]):
        location = record_audio('What is the locatio n?')
        url = 'https://google.nl/maps/place/' + location + '/&amp;amp;'
        webbrowser.get().open(url)
        speak('Opening map of' + location )
    # 6: search youtube
    if there_exists(["search youtube","search the youtube","search in youtube","in
youtube","on youtube"]):
        search = record_audio('What do you want to search for?')
        r.pause_threshold=2
        url =  'https://www.youtube.com/results?search_query='+search
        webbrowser.get().open(url)
        speak('Here is what I found')
        #OS shutdown
    if there_exists(["shutdown system","system off","shutdown the
```

```
system","system shutdown"]):
        speak('Okay system will off in 30 seconds')
        os.system("shutdown /s /t 30")

    if there_exists(["good","thank you","thanks","well done"]):
        greetings = ["my pleasure","Don't mention","Thanks for your compliment","No problem.","Thank you, it makes my day to hear that."]
        greet = greetings[random.randint(0,len(greetings)-1)]
        speak(greet)

    if there_exists(["exit", "quit","sleep","shut up","close"]):
        greetings = ["Going offline ! you can call me Anytime","Okay ,you can call me Anytime","See you later","See you soon","Have a good day."]
        greet = greetings[random.randint(0,len(greetings)-1)]
        speak(greet)
        exit()

time.sleep(1)
while(1):
    voice_data = record_audio() # get the voice input
    respond(voice_data) # respond
    if there_exists(["exit", "quit","sleep","shut up","close"]):
        greetings = ["Going offline ! you can call me Anytime","Okay ,you can call me Anytime","See you later","See you soon","Have a good day."]
```

```
greet = greetings[random.randint(0,len(greetings)-1)]
speak(greet)
exit()
```

Getting started

Prerequisites:

* Your computer must be running Python3.9 or newer.

Dependencies

* Below is the list of libraries that has been used. You must need to install all, before executing the programme

pip install speechrecognition

pip install gTTS

pip install pyaudio

pip install playsound==1.2.2

pip install PyAudio

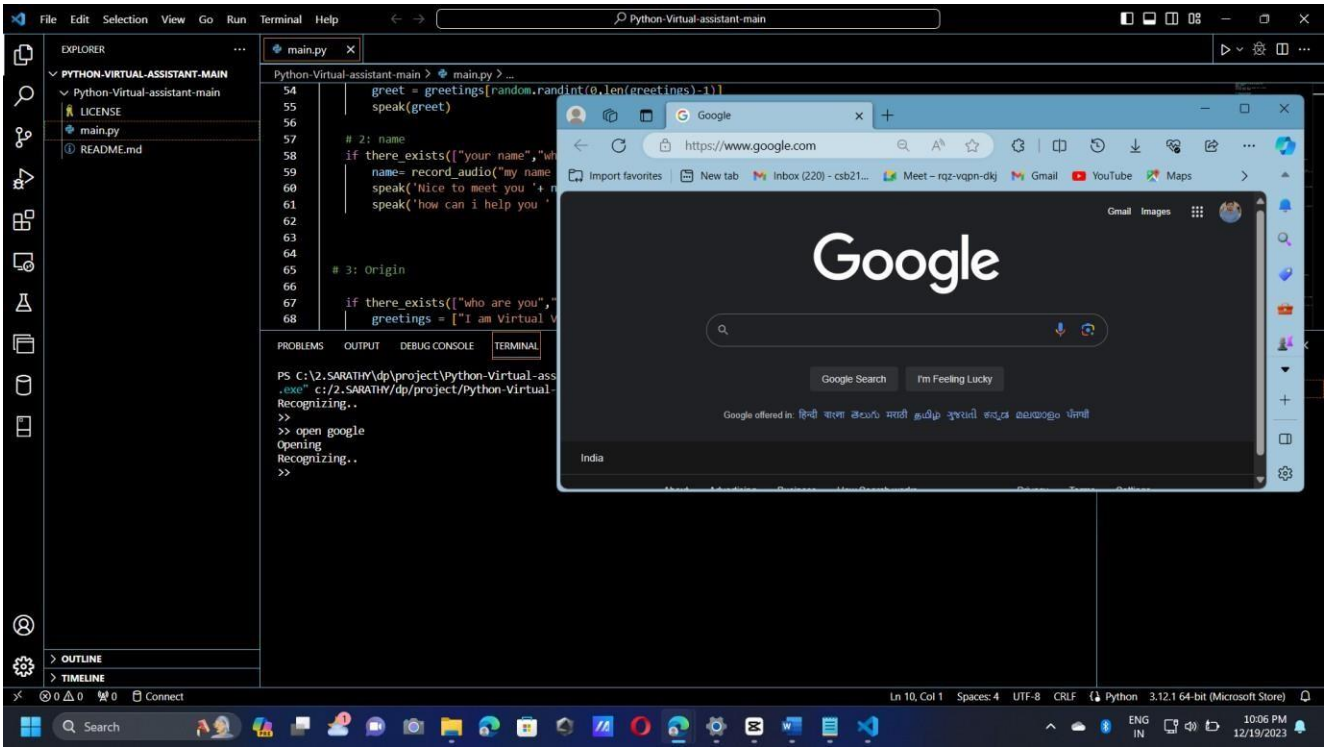
Features

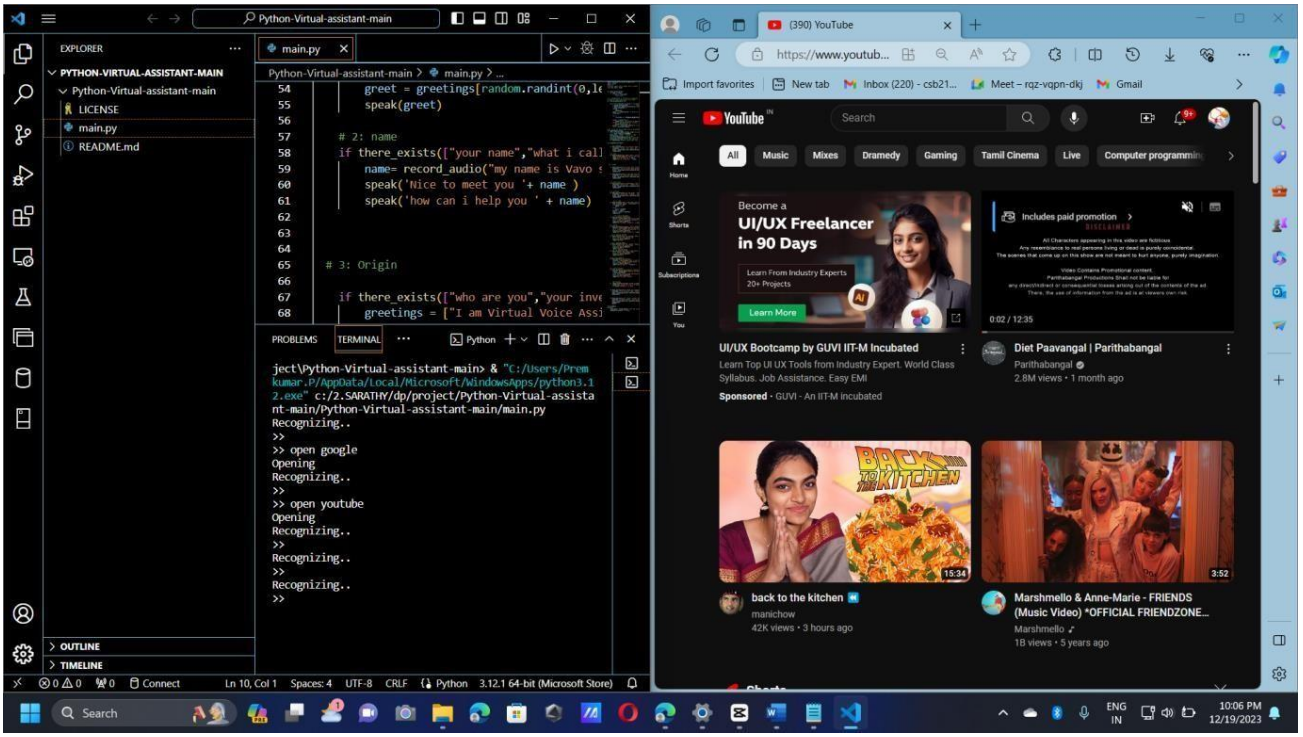
****Voice Commands****

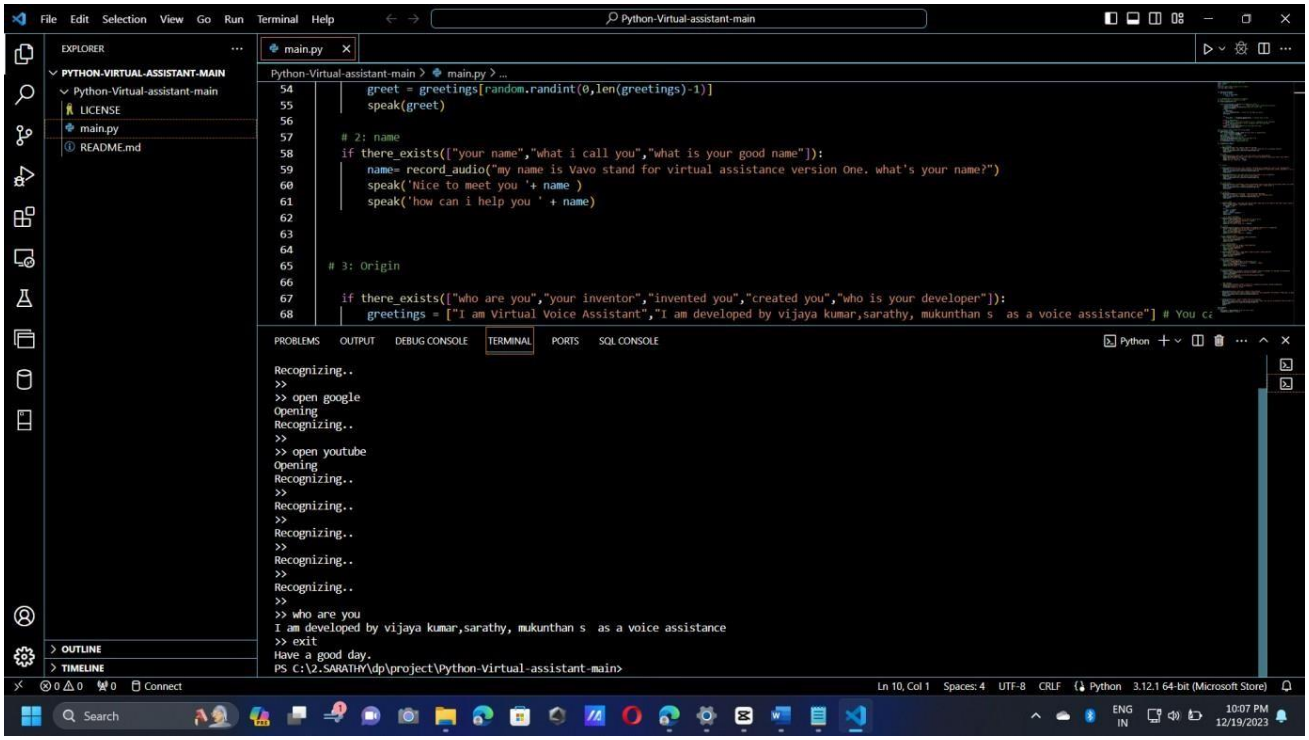
Since it can take various types of voice inputs for interaction and gives a random voice output which makes it more interactive.

You can also add other commands, here an example that exists

APPENDIX B(Screen Shot)






File Edit Selection View Go Run Terminal Help
Python-Virtual-assistant-main
EXPLORER
PYTHON-VIRTUAL-ASSISTANT-MAIN
Python-Virtual-assistant-main
LICENSE
main.py
README.md
main.py
Python-Virtual-assistant-main > main.py > ...
54 greet = greetings[random.randint(0,len(greetings)-1)]
55 speak(greet)
57 # 2: name
58 if there_exists(["your name","what i call you","what is your good name"]):
59 name= record_audio("my name is Vavo stand for virtual assistance version One. what's your name?")
60 speak('Nice to meet you '+ name)
61 speak('how can i help you ' + name)
65 # 3: Origin
67 if there_exists(["who are you","your inventor","invented you","created you","who is your developer"]):
68 greetings = ["I am Virtual Voice Assistant","I am developed by vijaya kumar,sarathy, mukunthan s as a voice assistance"] # You ca
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS SQL CONSOLE
Python
Recognizing..
>>
>> open google
Opening
Recognizing..
>>
>> open youtube
Opening
Recognizing..
>>
Recognizing..
>>
Recognizing..
>>
Recognizing..
>>
Recognizing..
>>
>> who are you
I am developed by vijaya kumar,sarathy, mukunthan s as a voice assistance
>> exit
Have a good day.
PS C:\2.SARATHY\dp\project\Python-Virtual-assistant-main>
OUTLINE
TIMELINE
Connect
Ln 10, Col 1 Spaces: 4 UTF-8 CRLF Python 3.12.1 64-bit (Microsoft Store)
Search
ENG IN
10:07 PM 12/19/2023

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