DESKTOP VOICE ASSISTANT

A DESIGN PROJECT REPORT

submitted by

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in partial fulfilment for the award of the degree

of

BACHELOR OF ENGINEERING

in

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(An Autonomous Institution, affiliated to Anna University Chennai, Approved by AICTE, New Delhi)

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BONAFIDE CERTIFICATE

Certified that this project report titled **"DESKTOP VOICE ASSISTANT"** is bonafide work of **DEEPAK MADHU KUMAR N (811722104026), FADHEELUDDEEN K (811722104040), SIVA SARAVANAN KKV (811722104307)** who carried out the project under my supervision. Certified further, that to the best of my knowledge the work reported here in 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.

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DECLARATION

We jointly declare that the project report on **"DESKTOP VOICE ASSISTANT"** 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**.

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ABSTRACT

A desktop voice assistant is an advanced human-computer interaction tool that enables users to control their digital devices and applications through natural voice commands. This state-of-the-art system integrates speech recognition, natural language processing, and text-to-speech technologies to understand user intents and execute tasks seamlessly. By eliminating the reliance on traditional input methods like keyboards and mice, the desktop voice assistant offers a hands-free, efficient, and intuitive user experience. It is particularly beneficial for individuals with mobility challenges or those seeking enhanced productivity in multitasking environments. The technology has immense potential across various domains, including accessibility, smart office environments, and personalized task management. Recent advancements in machine learning, speech processing, and contextual understanding have significantly improved the accuracy, responsiveness, and personalization of desktop voice assistants, paving the way for diverse applications and use cases. As this technology continues to evolve, desktop voice assistants are set to transform the way users interact with digital systems, making computing more accessible, intelligent, and inclusive for all.

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LIST OF ABBREVIATIONS

ABBREVIATION	FULL FORM
AI	Artificial Intelligence
NLP	Natural Language Processing
API	Application Programming Interface
TMDB	The Movie Database
NLU	Natural Language Understanding
IPA	Intelligent Personal Assistant
IOT	Internet Of Things
CMU	Carnegie Mellon University
TTS	Text To Speech
HTTP	Hypertext Transfer Protocal
JSON	JavaScript Object Notation
OS	Operating System
CNN	Convolutional Neural Network
NLTK	Natural Language Toolkit
GPT	Generative Pre-Trained Transformer
UI	User Interface
OCR	Optical Character Recognition

CHAPTER 1

INTRODUCTION

Artificial intelligence (AI) and natural language processing (NLP) technologies have significantly evolved, enabling the development of sophisticated systems capable of interacting with humans through speech. Popular voice-enabled personal assistants, such as Alexa, Siri, and Google Assistant, have become indispensable tools in managing day-to-day activities, from setting reminders to providing weather updates. These systems exemplify the potential of AI in delivering convenience and efficiency. Despite their widespread adoption, commercial voice assistants often come with limitations. They are typically restricted to proprietary ecosystems, lack significant customization options, and may involve recurring costs. This creates a gap for users and developers who desire affordable, open-source, and flexible solutions tailored to their unique needs. Python, a programming language renowned for its simplicity and rich library ecosystem, offers immense potential in this domain. It allows developers to create powerful applications with ease, making it an ideal choice for designing voice-enabled assistants. This project aims to utilize Python's capabilities to create a customizable personal assistant that integrates with various APIs to deliver a seamless and interactive experience. By bridging functionality and personalization, the assistant is designed to enhance productivity, simplify tasks, and serve as a learning tool for aspiring developers.

1.1 OVERVIEW

The AI Personal Assistant with Voice Interaction is a Python-based application leveraging speech recognition and text-to-speech technologies to interact with users and perform a variety of tasks. It automates desktop actions like opening Notepad, Camera, or Discord, retrieves real-time information such as weather updates, news headlines, and trending movie details through APIs like OpenWeather, NewsAPI, and TMDB, and facilitates communication by sending emails and WhatsApp messages via voice commands. Powered by libraries such as

pyttsx3, speech_recognition, and pywhatkit, the assistant also offers entertainment features like playing YouTube videos, sharing jokes, and providing advice. Its integration of robust APIs ensures accurate and timely data delivery, making it a customizable and efficient tool for users seeking an open-source alternative to commercial AI assistants.

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1.2 IMPLICATIONS

The development and deployment of the AI Personal Assistant carry significant implications for individuals and the developer community. It serves as a valuable educational resource, offering students, hobbyists, and professionals hands-on experience with AI, natural language processing, and API integration while showcasing Python's practical applications in creating intelligent tools. As an open-source project, it enhances accessibility and affordability by eliminating the cost barriers of commercial systems, empowering users to build functional AI assistants without expensive hardware or proprietary platforms. By automating repetitive tasks, streamlining communication, and providing real-time data retrieval, the assistant boosts productivity and helps users stay organized. Furthermore, it fosters community contribution by providing a collaborative framework for developers to innovate and expand its features, thereby strengthening the open-source ecosystem. Demonstrating practical AI integration into everyday tasks, the project highlights the transformative potential of AI and inspires further exploration of AI-driven solutions for common challenges.

CHAPTER 2
LITERATURE SURVEY

2.1 TITLE : Voice-Based Intelligent Personal Assistant Using Artificial Intelligence

AUTHOR : P. Rajasekhar, P. Kalyani

YEAR : 2024

The paper titled "Voice-Based Intelligent Personal Assistant Using Artificial Intelligence" details the design and development of a voice-driven intelligent personal assistant (IPA) leveraging advanced artificial intelligence techniques. It explores how the system employs speech recognition to process spoken input from users, translating voice commands into text for further interpretation. Using natural language understanding (NLU), the system deciphers the user's intent and responds accordingly, providing a seamless interaction. The authors discuss the integration of various APIs to retrieve real-time information, enabling the assistant to perform tasks such as providing weather updates, setting alarms, and managing device-specific applications. Additionally, the paper conducts a comparative analysis of existing speech-to-text technologies, evaluating their performance and accuracy to justify the selection of tools and algorithms used in the project. This comprehensive approach highlights the potential of voice-based assistants to enhance user convenience and improve task automation through intelligent, context-aware responses.

2.2 TITLE : Customizable Voice Assistant for Task Automation

AUTHOR : R. Prasad, S. Nair

YEAR : 2023

In "Customizable Voice Assistant for Task Automation" presents the design and implementation of a highly flexible and adaptive voice assistant framework capable of catering to individual user preferences and requirements. The authors leverage Python's rich library ecosystem, which includes modules for speech recognition, text-to-speech synthesis, and seamless integration with

various APIs, to enable a user-friendly and efficient assistant. The system is capable of executing a wide range of commands, such as launching desktop applications, controlling media playback, retrieving real-time data from online sources, and even managing basic system settings. A significant feature of the framework is its use of machine learning models, which enhance the assistant's ability to accurately interpret user commands, adapt to unique speech patterns, and provide a personalized experience. The authors delve into the training and optimization of these models, focusing on how they improve the assistant's contextual understanding and response accuracy. The framework also incorporates mechanisms for continuous learning, allowing it to evolve and become more effective over time based on user interactions. The paper places a strong emphasis on scalability, demonstrating how the framework can be extended to support various platforms, including desktop environments, mobile devices, and Internet of Things (IoT) systems. The assistant's modular design allows for easy customization and integration of additional functionalities, making it suitable for a wide range of applications, from personal productivity to smart home automation. By addressing key challenges such as command disambiguation and multi-device synchronization, the authors showcase the potential of their customizable voice assistant to enhance task automation and improve user convenience in both personal and professional contexts.

2.3 TITLE : A Review on AI-Powered Virtual Assistants

AUTHOR : M. Krishnan, A. Gupta

YEAR : 2023

In “A Review on AI-Powered Virtual Assistants” provides a comprehensive examination of advancements in virtual assistant technology, with a focus on artificial intelligence's role in enhancing functionality. The authors analyze both open-source and proprietary systems, comparing their architectures, strengths, and limitations. . The authors evaluate multiple speech-to-text APIs, such as Google Speech-to-Text and CMU Sphinx, comparing their

accuracy and performance. The assistant integrates APIs for real-time data retrieval, offering functionalities like weather updates, news summaries, and YouTube playback. The paper also discusses design challenges, such as optimizing response times and ensuring smooth API communication, while providing a roadmap for further enhancements. A Python-based framework is proposed. The study delves into speech recognition accuracy, context understanding, and the integration of external data sources such as weather APIs and news feeds. Key challenges in creating multilingual and adaptive assistants are discussed, along with potential future developments in the field.

2.4 TITLE : Speech Recognition and Command Processing for Personal Assistants

AUTHORS : T. Deshmukh, K. Ramesh

YEAR : 2023

In "Speech Recognition and Command Processing for Personal Assistants" explores the implementation of a speech recognition-based command processing system for personal assistants. The authors evaluate multiple speech-to-text APIs, such as Google Speech-to-Text and CMU Sphinx, comparing their accuracy and performance. The assistant integrates APIs for real-time data retrieval, offering functionalities like weather updates, news summaries, and YouTube playback. The paper also discusses design challenges, such as optimizing response times and ensuring smooth API communication, while providing a roadmap for further enhancements. A Python-based framework is proposed, which utilizes these APIs to process voice commands and execute predefined tasks like managing files and retrieving online data. The study highlights the challenges of noisy environments and accents, providing insights into algorithmic improvements to address these issues.

2.5 TITLE : Building Real-Time Intelligent Systems with Python

AUTHORS : A. Banerjee, S. Kapoor

YEAR : 2023

In “Building Real-Time Intelligent Systems with Python” presents a hands-on approach to building intelligent systems using Python, with a focus on real-time interaction. The authors describe a voice assistant project that leverages Python libraries such as speech_recognition, pyttsx3, and pywhatkit to create a responsive system. A significant feature of the framework is its use of machine learning models, which enhance the assistant's ability to accurately interpret user commands, adapt to unique speech patterns, and provide a personalized experience. The authors delve into the training and optimization of these models, focusing on how they improve the assistant's contextual understanding and response accuracy. The framework also incorporates mechanisms for continuous learning, allowing it to evolve and become more effective over time based on user interactions. The assistant integrates APIs for real-time data retrieval, offering functionalities like weather updates, news summaries, and YouTube playback. The paper also discusses design challenges, such as optimizing response times and ensuring smooth API communication, while providing a roadmap for further enhancements. A significant feature of the framework is its use of machine learning models, which enhance the assistant's ability to accurately interpret user commands, adapt to unique speech patterns, and provide a personalized experience. The authors delve into the training and optimization of these models, focusing on how they improve the assistant's contextual understanding and response accuracy. The framework also incorporates mechanisms for continuous learning, allowing it to evolve and become more effective over time based on user interactions. The paper places a strong emphasis on scalability, demonstrating how the framework can be extended to support various platforms, including desktop environments, mobile devices, and Internet of Things (IoT) systems.

CHAPTER 3
SYSTEM ANALYSIS

3.1 EXISTING SYSTEM

Current voice-enabled personal assistant systems, such as Amazon Alexa, Google Assistant, and Apple Siri, dominate the market with advanced AI and machine learning capabilities. These systems feature high-accuracy speech recognition powered by NLP models, real-time data retrieval for weather updates, news, and reminders, as well as task automation for managing schedules, controlling IoT devices, and performing computations. However, they are tightly integrated into proprietary ecosystems, such as Apple devices for Siri and Google's platform for Assistant. Despite their strengths, these systems have notable limitations, including limited customizability, high costs for premium features and hardware, privacy concerns due to reliance on cloud services, and restrictions to specific devices and ecosystems, which hinder cross-platform functionality and broader accessibility.

3.1.1 DISADVANTAGES

Despite their advanced capabilities, current voice-enabled personal assistant systems come with several disadvantages. They offer limited customizability, preventing users from modifying or adding personalized features to meet unique needs. High costs associated with premium functionalities and proprietary hardware create a financial barrier for many users. Privacy concerns are another significant drawback, as these systems often rely on cloud-based services, raising questions about data security and user confidentiality. Additionally, their platform-specific nature restricts functionality to certain ecosystems, such as Apple for Siri or Google for Assistant, limiting cross-platform compatibility and flexibility for users who prefer diverse or independent device setups.

3.2 PROPOSED SYSTEM

In Python-based AI Personal Assistant addresses the limitations of existing systems by offering a customizable, open-source alternative designed for efficiency and adaptability. Unlike proprietary platforms, this assistant is fully customizable, accessible to developers, and compatible across platforms with Python installed. It provides both offline and online functionalities, ensuring basic tasks can be performed without internet connectivity, while advanced features like real-time data retrieval require APIs such as OpenWeather, NewsAPI, and TMDB. Enhanced privacy is a key focus, with local data processing for offline tasks to minimize privacy risks. Additionally, its support for natural language input and speech-based output enables dynamic, interactive user experiences, making it a versatile and user-centric tool.

3.3 BLOCK DIAGRAM OF PROPOSED SYSTEM

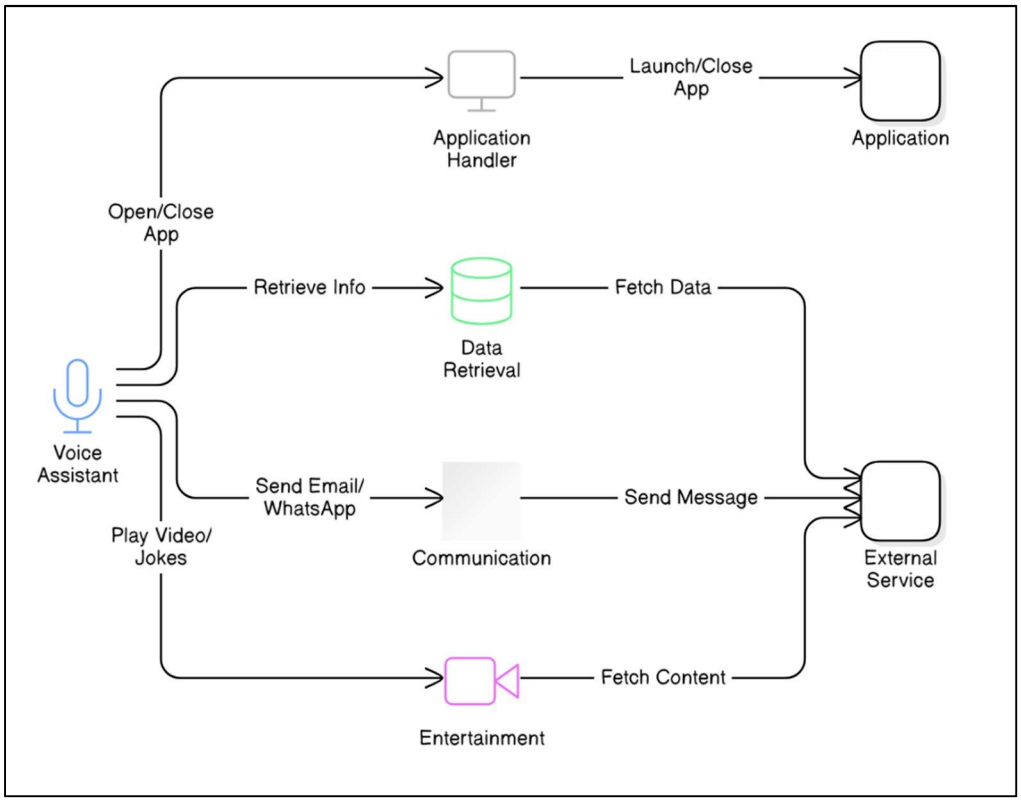


Fig 3.3 Block diagram of proposed system

3.4 USE-CASE DIAGRAM

The Use-Case Diagram offers a high-level representation of the system's functionality, illustrating the interactions between the system and its actors. The primary actors include the User, who directly interacts with the assistant, and External Services, such as APIs used for data retrieval. Key functionalities of the system include User Interaction, enabling real-time communication through greetings and error handling; Application Management, which handles actions like opening and closing applications; Information Retrieval, which searches and retrieves data; Communication Tasks, facilitating email and WhatsApp message sending; and Entertainment, which engages users with jokes, videos, and other interactive features. These functionalities ensure a comprehensive and user-centric experience.

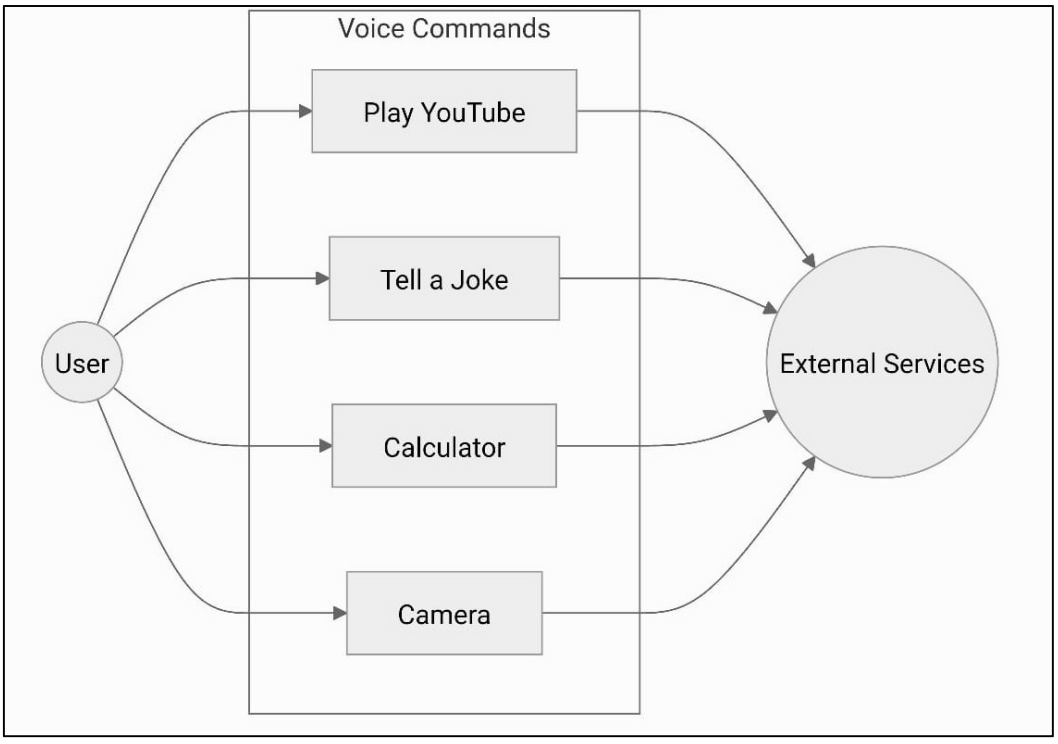


Fig 3.4 Use Case Diagram

3.5 SEQUENCE DIAGRAM

The Sequence Diagram depicts the interaction between different objects over time. For example, when the user commands to open a video, the system processes the input and responds by opening a video on YouTube.

1. **Objects** :
    1. User
    2. Voice Assistant
    3. External Service
2. **Flow**:
    1. User interacts with voice assistant to give command
    2. Voice assistant processes the command
    3. Command is executed by the console

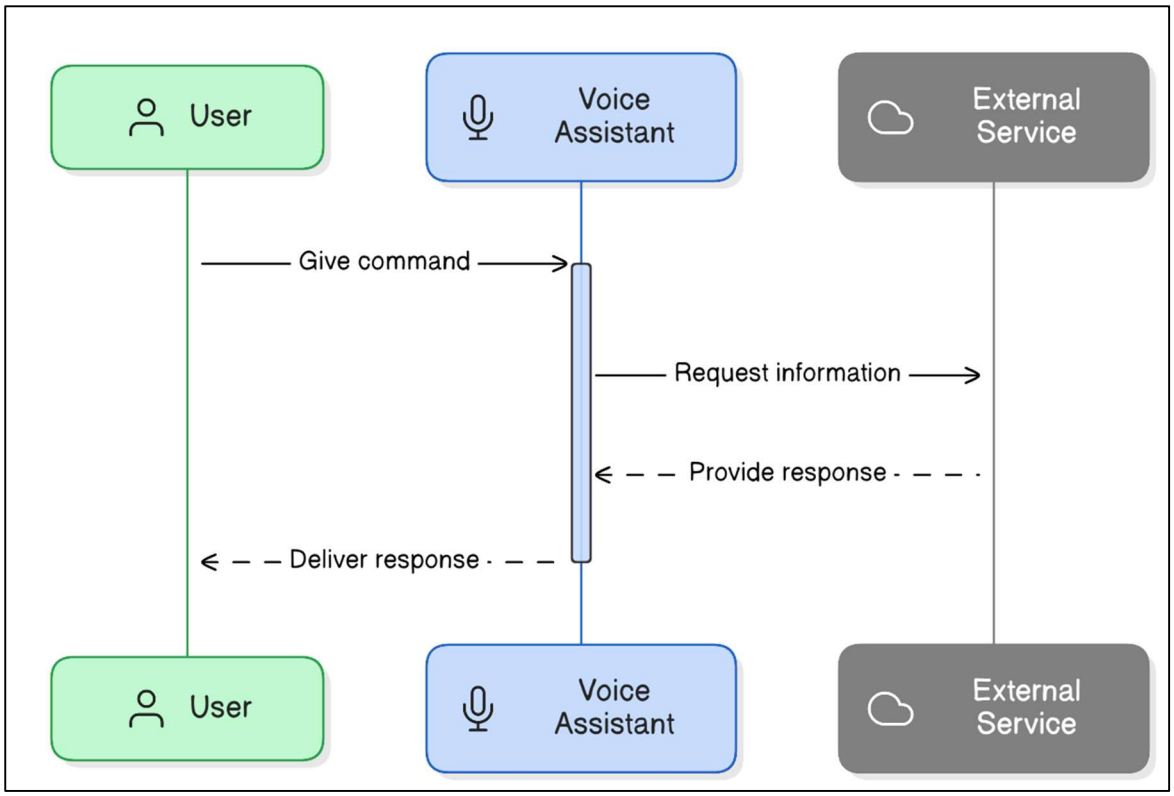


Fig 3.5 Sequence Diagram

3.6 ACTIVITY DIAGRAM

The Activity Diagram represents the workflow of the system's operations. It highlights the sequence of actions that the system performs to execute a given command

1. Start Interaction
2. Capture voice input – vocal command gets captured

3. Conversion – conversion of vocal command to textual command
4. Analysis – Analyse the textual input
5. Determine command type – Identify the type of command and execute the required command
6. End

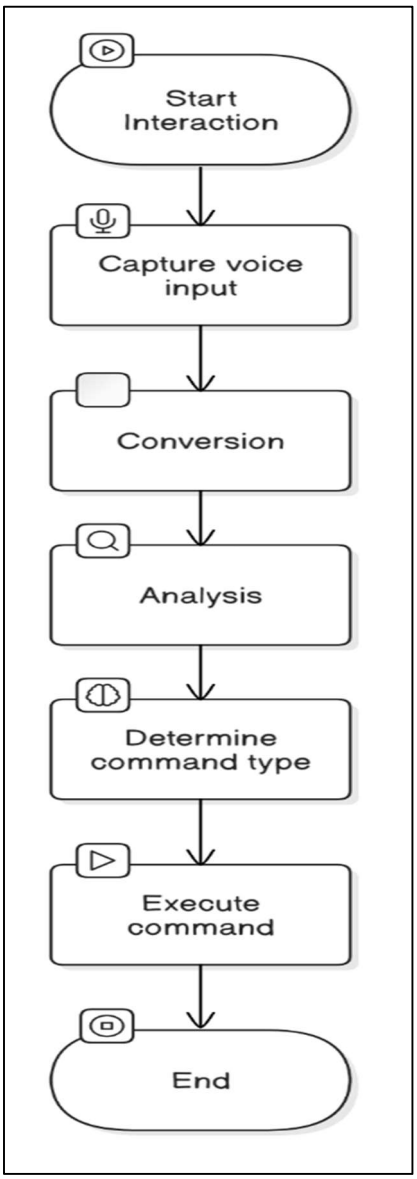


Fig 3.6 Activity Diagram

CHAPTER 4

MODULES

4.1 MODULE DESCRIPTION

1. Speech Recognition
2. Web Scraping and API Interaction
3. System Interaction
4. Command Processing
5. Action Execution

4.2 SPEECH RECOGNITION

The speech_recognition library is utilized to convert spoken language into text, allowing the assistant to interpret and respond to user voice commands. It supports multiple recognition engines, including Google's Web Speech API and CMU Sphinx, providing flexibility for various use cases. Additionally, it features noise reduction to improve accuracy in noisy environments and supports multiple languages, enhancing the versatility of the assistant. In this project, when a user gives a command like "Open Notepad," "What's the weather today?" or "Send an email," the library listens to the speech, processes it into text, and passes it to the command processing module for further action. It operates offline, ensuring it does not require an internet connection, and allows for control over the speech rate, pitch, and volume, as well as supporting multiple voices, such as male or female. When the assistant generates a response, such as a weather update or confirming an action like "Opening Notepad," pyttsx3 converts the text response into speech. The algorithm involves preparing a text response, converting it to speech using pyttsx3, and playing the resulting audio through the system's speakers, allowing the user to hear the assistant's reply. This integration of both speech_recognition and pyttsx3 enables a seamless, interactive voice-based experience with the assistant.

4.3 WEB SCRAPING AND API INTERACTION

The assistant relies on external APIs to fetch real-time data, such as weather updates, news, and movie information. The requests module is used to make HTTP requests to these external APIs, while the json module is used to parse the responses, typically in JSON format, into a Python data structure like a dictionary for easy manipulation. The OpenWeather API allows the assistant to retrieve weather information, including temperature, humidity, wind speed, and weather conditions such as sunny, cloudy, or rainy, based on the user's location. The NewsAPI enables the assistant to fetch the latest headlines from various news sources and read out relevant articles according to the user's preferences or current events. The TMDB API provides details on trending movies, recommendations, top-rated films, and upcoming releases, which the assistant can use to suggest popular movies based on user queries. Additionally, the pywhatkit library is employed to automate common tasks like opening YouTube videos, sending WhatsApp messages, and executing system commands such as opening applications. With pywhatkit, the assistant can send WhatsApp messages to a specified number, play YouTube videos by searching for the video name, and open applications like Notepad, Camera, or Discord based on voice commands. For example, when the user requests an action like "Play a YouTube video," pywhatkit searches for the video and plays it. Similarly, when asked to "Send a WhatsApp message," the assistant uses pywhatkit to send the message automatically.

4.4 SYSTEM INTERACTION

The purpose of these libraries is to interact with the system's operating environment, enabling the assistant to perform tasks like opening applications, opening files, or controlling system-level operations. The os module is used to execute system-level commands, such as opening applications like Notepad or Camera. For example, when the user says "Open Notepad," the assistant can use os.system('notepad') to launch Notepad. The subprocess module is used for more complex system-level tasks that might require interacting with the system's shell.

For instance, to open applications or execute batch commands, subprocess.run() can be used. These libraries enable the assistant to perform essential system operations based on voice commands, enhancing its functionality and interactivity.

4.5 COMMAND PROCESSING

The process begins with text input, where the assistant receives the transcribed text from the speech recognition module. Then, the system performs keyword identification by searching for specific keywords within the text, such as "weather", "open", "send email", or "play". After identifying the relevant keywords, the system proceeds with intent recognition, determining the user's intent based on the keywords. For example, if the text contains the keyword "weather," the intent is recognized as a request for the weather report. Next, the assistant moves to action determination, deciding on the appropriate action—whether it's fetching data from an API, opening an application, or executing a system command. Finally, the system returns the action by either providing a data response, such as the weather report, or initiating a system-level action like opening Notepad, based on the recognized intent.

4.6 ACTION EXECUTION

The process starts with the assistant receiving the action request from the user, such as opening Notepad or sending a WhatsApp message. Next, the assistant prepares the appropriate command based on the action type, such as a system command or message to send. The assistant then executes the command using system-level interaction libraries like os or subprocess, which handle tasks like opening applications or running scripts. Finally, after the task is executed, the assistant provides confirmation or feedback to the user, such as "Notepad is open," ensuring the user knows the action was completed successfully.

CHAPTER 5

SYSTEM SPECIFICATION

5.1 HARDWARE REQUIREMENTS

- Processor – Intel i3 or Higher.
- RAM – 4GB or Higher.
- Storage – 150GB or Higher.
- Microphone
- Speakers or Headphones

5.2 SOFTWARE REQUIREMENTS

- Operating System – Windows 7 or Higher.
- Languages Used – Python.
- Python Libraries – speech_recognition, pyttsx3, pyaudio

5.2.1 PYTHON

Python's rich ecosystem of libraries for image processing and deep learning like Colourizers are employed for image manipulation tasks, while deep learning framework Torch is utilized to train and deploy convolutional neural networks (CNNs) for colorization. Python scripts handle data preprocessing, model training, and inference, allowing the restoration of historical images with vibrant colors. Additionally, Python's simplicity facilitates collaborative development and experimentation, enabling researchers to continually improve the colorization algorithms and techniques.

CHAPTER 6

METHODOLOGY

6.1 REQUIREMENTS GATHERING AND ANALYSIS

The initial phase of developing the voice assistant focuses on gathering requirements to define its functionalities and performance criteria. This involves identifying key features such as voice recognition, providing weather updates, opening applications, and other tasks while considering system constraints like hardware specifications. Key activities include collecting feedback from stakeholders, including potential users and developers, to better understand the assistant's intended functionalities. Use cases are defined, such as responding to user queries for weather updates, opening apps via voice commands, and sending emails or WhatsApp messages. Additionally, external APIs like OpenWeather, NewsAPI, and TMDB are evaluated and selected for real-time data fetching. The deliverables for this phase include a Functional Requirements Document outlining all features and a list of non-functional requirements specifying expected performance, speed, and reliability.

6.2 SYSTEM DESIGN

The system design phase aims to create a blueprint for the voice assistant's architecture by breaking it into manageable modules that interact seamlessly. The key activities include designing the system's architecture, which follows a client-server model where the assistant operates on the client (local machine) while interacting with external APIs and executing system commands. The system is decomposed into core modules, including a Speech Recognition Module for capturing and transcribing voice, a Command Processing Module for interpreting and executing commands, a Data Retrieval Module for interfacing with APIs, an Action Execution Module for opening applications or sending messages, and a Text-to-Speech Module for generating spoken responses from text. Additionally, the data flow is designed to describe how information moves between these modules, often visualized using a flowchart to illustrate the process clearly.

6.3 IMPLEMENTATION

The implementation phase focuses on the actual development of the AI personal assistant, emphasizing coding each module, integrating external libraries, and ensuring seamless interaction between components. Key activities include developing the Speech Recognition Module using libraries like speech_recognition to capture and transcribe speech into text by leveraging a microphone to listen for audio and a recognizer object to process it. The Command Processing Module involves implementing natural language processing (NLP) techniques to parse the transcribed text, identify commands or requests, and handle actions like playing a YouTube video or checking the weather through keyword matching or intent recognition using algorithms or libraries like NLTK. The Text-to-Speech Module leverages the pyttsx3 library to convert text into speech, with adjustable voice parameters like speed and pitch for an enhanced user experience. Deliverables include fully functional modules for speech recognition, command processing, real-time data retrieval, and system command execution, along with the integration of external APIs for real-time weather, news, and movie data.

6.4 INTEGRATION

The integration phase focuses on combining all the individual modules into a unified system, ensuring that the AI assistant functions as expected. The main goal is to create a cohesive system where voice recognition, command processing, data retrieval, and system interaction work seamlessly together. Key activities include module integration , enabling the assistant to recognize voice commands, identify the correct intent, and execute actions or fetch data as required. Additionally, external API integration is validated to ensure the assistant communicates effectively with services like OpenWeather or NewsAPI, retrieving accurate real-time information. The assistant consistently provides accurate outputs based on voice commands.

6.5 TESTING AND VALIDATION

The testing phase ensures that the AI assistant functions as intended and meets the requirements outlined during the initial stages. This phase involves verifying the assistant's functionality, performance, and usability through various testing activities. Unit testing focuses on evaluating individual modules, such as speech recognition, text-to-speech, and API calls, to ensure they operate correctly in isolation. Integration testing examines the interactions between modules, verifying that they work together seamlessly, such as ensuring speech input triggers the appropriate system actions or API calls. Acceptance testing involves real users validating whether the assistant meets their needs and expectations. Performance testing evaluates the system's behavior under varying conditions, such as handling multiple simultaneous requests or operating in low-resource environments.

6.6 DEPLOYMENT

The deployment phase prepares the AI assistant for real-world use, ensuring it is fully operational in the target environment. This phase includes packaging the application to make it available for installation through an installer or direct download. Comprehensive documentation is provided, including user manuals for end-users and technical guides for developers to facilitate future development or troubleshooting. Post-deployment support is established to address updates, bug fixes, or the release of new features. User training is also conducted to help end-users understand how to interact with the assistant and utilize its features effectively. The primary deliverables include a fully deployed and operational AI assistant, along with detailed user and developer documentation to support its installation, setup, usage, and maintenance.

CHAPTER 7

CONCLUSION AND FUTURE ENHANCEMENT

The development of the AI Personal Assistant with Voice Interaction marks a significant step forward in creating accessible, user-friendly technology for everyday applications. This project showcases the power of Python and its ecosystem to build an interactive system capable of understanding natural language, performing diverse tasks, and delivering real-time information. By integrating multiple APIs and Python libraries such as speech_recognition, pyttsx3, and pywhatkit, the assistant effectively bridges the gap between humans and machines, making complex tasks more straightforward through voice commands. One of the most noteworthy aspects of this project is its modular design, which ensures scalability and adaptability. Whether opening applications, fetching the latest weather reports, playing music, or delivering news, the assistant provides a seamless and efficient solution for simplifying daily routines. Moreover, its integration with real-time data APIs, such as OpenWeather for weather updates or NewsAPI for current headlines, highlights its capability to adapt to the dynamic nature of user needs. This project goes beyond a simple voice command tool by offering a personalized and interactive experience. The inclusion of features like jokes, advice, and entertainment options demonstrates how technology can cater not just to productivity but also to the well-being of users. Its emphasis on ease of use and conversational interaction underscores the potential for voice-enabled AI to become an integral part of modern life. The AI Personal Assistant is not merely a technological innovation but a glimpse into the future of human-computer interaction. It illustrates how technology can augment human capabilities, save time, and create a more intuitive and enjoyable interface for digital experiences. As digital assistants continue to evolve, they hold the promise of transforming how we interact with technology, making it more natural, accessible, and effective.

APPENDIX -1

(SOURCE CODE)

1. Main.py FILE

```
import requests
from functions.online_ops import find_my_ip, get_latest_news,
get_random_advice, get_random_joke, get_trending_movies,
get_weather_report, play_on_youtube, search_on_google,
search_on_wikipedia, send_email, send_whatsapp_message
import pyttsx3
import speech_recognition as sr
from decouple import config
from datetime import datetime
from functions.os_ops import open_calculator, open_camera, open_cmd,
open_notepad, open_discord
from random import choice
from utils import opening_text
from pprint import pprint


USERNAME = config('USER')
BOTNAME = config('BOTNAME')


engine = pyttsx3.init('sapi5')

# Set Rate
engine.setProperty('rate', 190)

# Set Volume
engine.setProperty('volume', 1.0)

# Set Voice (Female)
voices = engine.getProperty('voices')
engine.setProperty('voice', voices[1].id)


# Text to Speech Conversion
def speak(text):
    """Used to speak whatever text is passed to it"""
```

```
    engine.say(text)
    engine.runAndWait()


# Greet the user
def greet_user():
    """Greets the user according to the time"""

    hour = datetime.now().hour
    if (hour >= 6) and (hour < 12):
        speak(f"Good Morning {USERNAME}")
    elif (hour >= 12) and (hour < 16):
        speak(f"Good afternoon {USERNAME}")
    elif (hour >= 16) and (hour < 19):
        speak(f"Good Evening {USERNAME}")
    speak(f"I am {BOTNAME}. How may I assist you?")


# Takes Input from User
def take_user_input():
    """Takes user input, recognizes it using Speech Recognition module and
converts it into text"""

    r = sr.Recognizer()
    with sr.Microphone() as source:
        print('Listening....')
        r.pause_threshold = 1
        audio = r.listen(source)

    try:
        print('Recognizing...')

        query = r.recognize_google(audio, language='en-in')

        if not 'exit' in query or 'stop' in query:
            speak(choice(opening_text))

        else:
            hour = datetime.now().hour

            if hour >= 21 and hour < 6:
                speak("Good night sir, take care!")
```

```
            else:
                speak('Have a good day sir!')

            exit()
        except Exception:
            speak('Sorry, I could not understand. Could you please say that again?')

            query = 'None'
        return query


if _name_ == '_main_':
    greet_user()
    while True:
        query = take_user_input().lower()

        if 'open notepad' in query:
            open_notepad()

        elif 'open discord' in query:
            open_discord()

        elif 'open command prompt' in query or 'open cmd' in query:
            open_cmd()

        elif 'open camera' in query:
            open_camera()

        elif 'open calculator' in query:
            open_calculator()

        elif 'ip address' in query:
            ip_address = find_my_ip()

            speak(f'Your IP Address is {ip_address}.\n For your convenience, I am
printing it on the screen sir.')

            print(f'Your IP Address is {ip_address}')

        elif 'wikipedia' in query:
            speak('What do you want to search on Wikipedia, sir?')

            search_query = take_user_input().lower()
```

```
            results = search_on_wikipedia(search_query)
            speak(f"According to Wikipedia, {results}")
            speak("For your convenience, I am printing it on the screen sir.")
            print(results)

        elif 'youtube' in query:
            speak('What do you want to play on Youtube, sir?')

            video = take_user_input().lower()

            play_on_youtube(video)

        elif 'search on google' in query:
            speak('What do you want to search on Google, sir?')

            query = take_user_input().lower()
            search_on_google(query)

        elif "send whatsapp message" in query:
            speak(
                'On what number should I send the message sir? Please enter in the
console: ')
            number = input("Enter the number: ")

            speak("What is the message sir?")

            message = take_user_input().lower()

            send_whatsapp_message(number, message)

            speak("I've sent the message sir.")

        elif "send an email" in query:
            speak("On what email address do I send sir? Please enter the console: ")
            receiver_address = input("Enter email address: ")

            speak("What should be the subject sir?")

            subject = take_user_input().capitalize()

            speak("What is the message sir?")
```

```
            message = take_user_input().capitalize()

            if send_email(receiver_address, subject, message):
                speak("I've sent the email sir.")
            else:

                speak("Something went wrong while I was sending the mail. Please
check the error logs sir.")

        elif 'joke' in query:

            speak(f"Hope you like this one sir")

            joke = get_random_joke()

            speak(joke)
            speak("For your convenience, I am printing it on the screen sir.")

            pprint(joke)

        elif "advice" in query:
            speak(f"Here's an advice for you, sir")

            advice = get_random_advice()
            speak(advice)

            speak("For your convenience, I am printing it on the screen sir.")
            print(advice)

        elif "trending movies" in query:
            speak(f"Some of the trending movies are: {get_trending_movies()}")

            speak("For your convenience, I am printing it on the screen sir.")

            print(*get_trending_movies(), sep='\n')

        elif 'news' in query:
            speak(f"I'm reading out the latest news headlines, sir")

            speak(get_latest_news())
            speak("For your convenience, I am printing it on the screen sir.")

            print(*get_latest_news(), sep='\n')
```

```
        elif 'weather' in query:
            ip_address = find_my_ip()
            city = requests.get(f"https://ipapi.co/{ip_address}/city/").text

            speak(f"Getting weather report for your city {city}")

            weather, temperature, feels_like = get_weather_report(city)

            speak(f"The current temperature is {temperature}, but it feels like
{feels_like}")

            speak(f"Also, the weather report talks about {weather}")

            speak("For your convenience, I am printing it on the screen sir.")

            print(f"Description: {weather}\nTemperature: {temperature}\nFeels
like: {feels_like}")
```

2. Online_ops.py FILE

```
import requests
import wikipedia
import pywhatkit as kit
from email.message import EmailMessage
import smtplib
from decouple import config

NEWS_API_KEY = config("NEWS_API_KEY")
OPENWEATHER_APP_ID = config("OPENWEATHER_APP_ID")
TMDB_API_KEY = config("TMDB_API_KEY")
EMAIL = config("EMAIL")
PASSWORD = config("PASSWORD")


def find_my_ip():
    ip_address = requests.get('https://api64.ipify.org?format=json').json()

    return ip_address["ip"]


def search_on_wikipedia(query):
    results = wikipedia.summary(query, sentences=2)
```

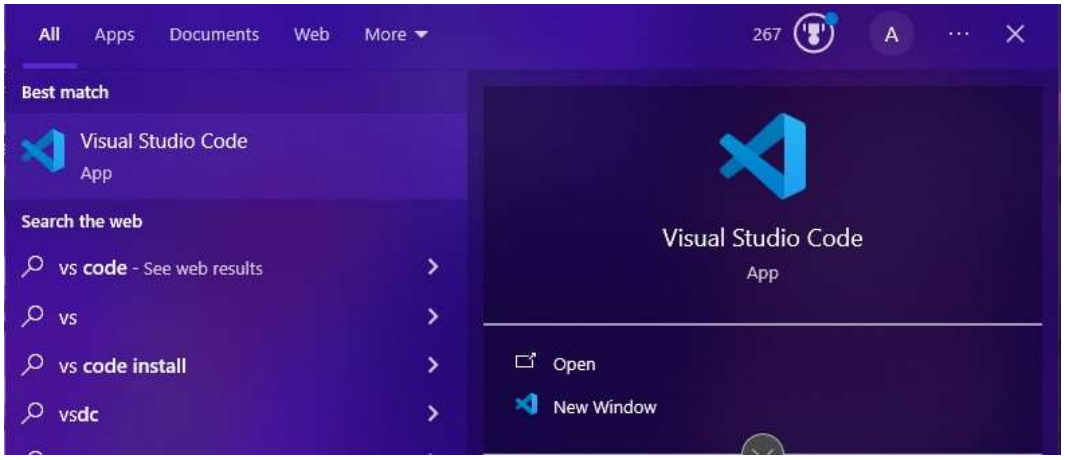
```
    return results


def play_on_youtube(video):
    kit.playonyt(video)


def search_on_google(query):
    kit.search(query)


def send_whatsapp_message(number, message):
    kit.sendwhatmsg_instantly(f"+91{number}", message)


def send_email(receiver_address, subject, message):
    try:
        email = EmailMessage()

        email['To'] = receiver_address

        email["Subject"] = subject

        email['From'] = EMAIL

        email.set_content(message)

        s = smtplib.SMTP("smtp.gmail.com", 587)

        s.starttls()
        s.login(EMAIL, PASSWORD)
        s.send_message(email)
        s.close()
        return True

    except Exception as e:
        print(e)
        return False

def get_latest_news():
    news_headlines = []

    res = requests.get(
```

```
        f"https://newsapi.org/v2/top-
headlines?country=in&apiKey={NEWS_API_KEY}&category=general").json
()
    articles = res["articles"]
    for article in articles:
        news_headlines.append(article["title"])
    return news_headlines[:5]
def get_weather_report(city):
    res = requests.get(

f"http://api.openweathermap.org/data/2.5/weather?q={city}&appid={OPENW
EATHER_APP_ID}&units=metric").json()

    weather = res["weather"][0]["main"]
    temperature = res["main"]["temp"]
    feels_like = res["main"]["feels_like"]
    return weather, f"{temperature}°C", f"{feels_like}°C"
def get_trending_movies():

    trending_movies = []
    res = requests.get(

f"https://api.themoviedb.org/3/trending/movie/day?api_key={TMDB_API_KE
Y}").json()
    results = res["results"]
    for r in results:
        trending_movies.append(r["original_title"])
    return trending_movies[:5]


def get_random_joke():
    headers = {
        'Accept': 'application/json'
    }
    res = requests.get("https://icanhazdadjoke.com/", headers=headers).json()
    return res["joke"]


def get_random_advice():
    res = requests.get("https://api.adviceslip.com/advice").json()
    return res['slip']['advice']
```

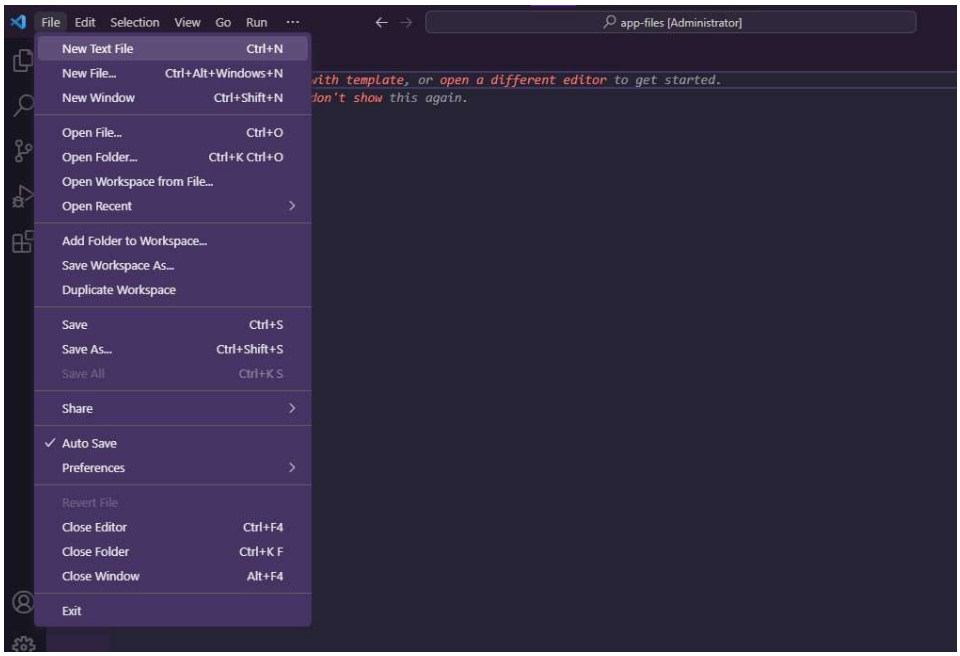
APPENDIX – 2

(SCREENSHOT)

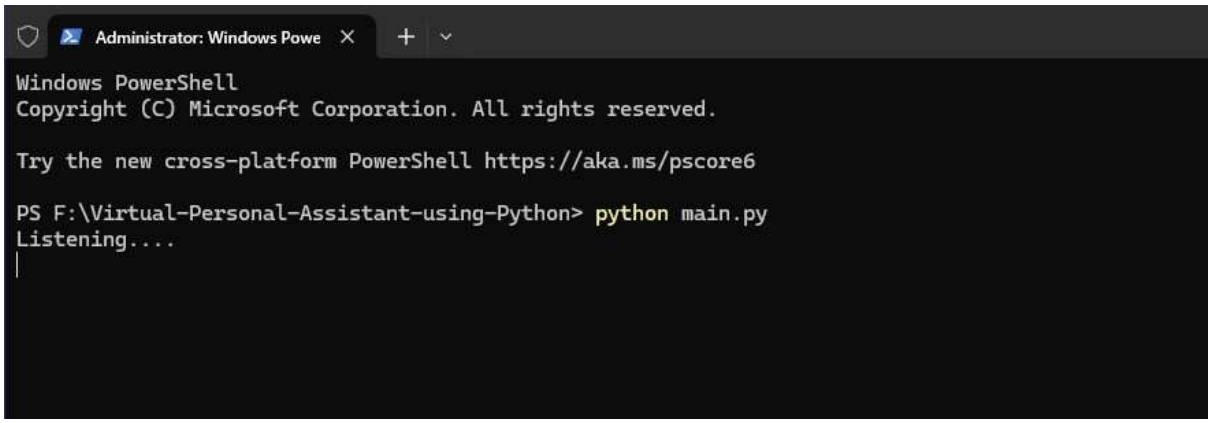
1. VISUAL STUDIO CODE – OPENING WINDOW



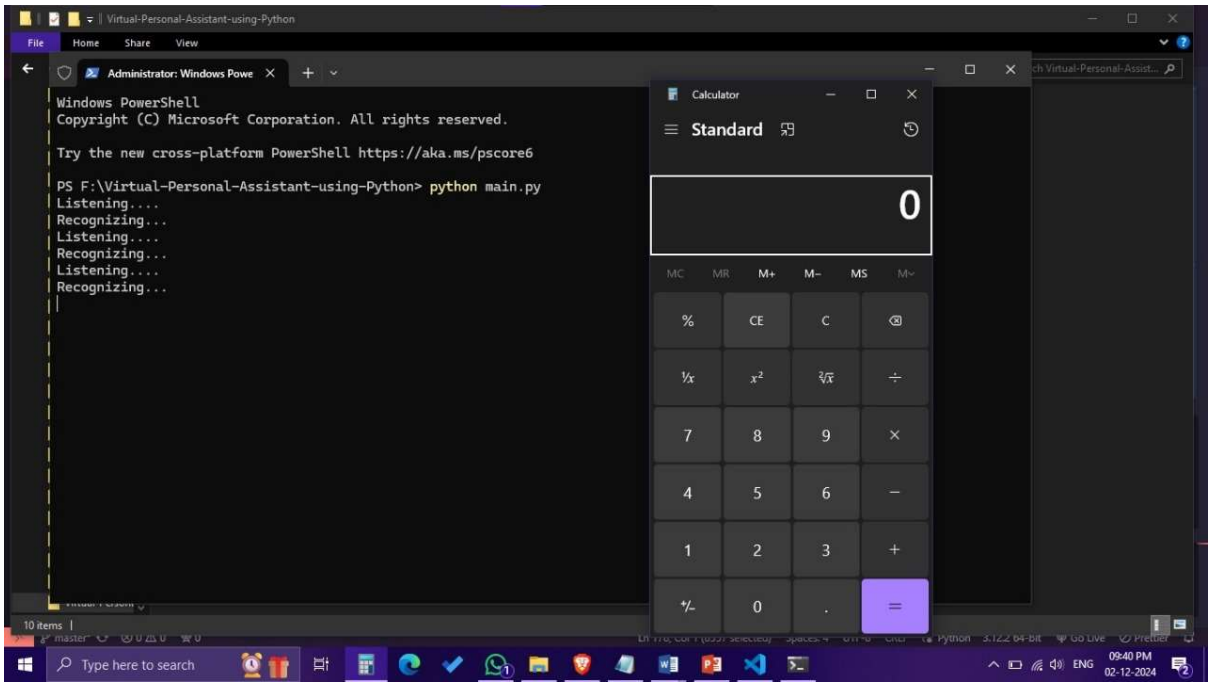
2. NEW PROJECT CREATION



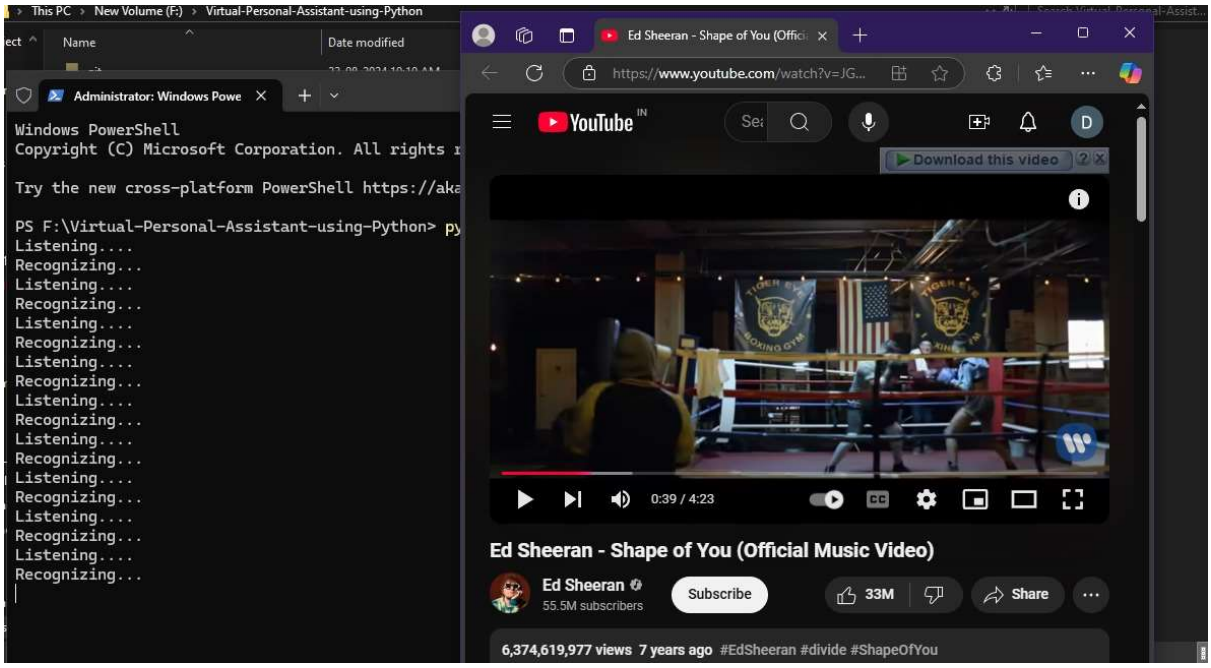
3. LAUNCHING APPLICATION



4. OPENING CALCULATOR



5. PLAYING YOUTUBE



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