# VISVESVARAYA TECHNOLOGICAL UNIVERSITY

## BELAGAVI-590014

A

Project Report On

## "SCI-FI AI VOICE ASSISTANT"

A technical report submitted in partial fulfillment of the requirements for the award of the degree of

**Bachelor of EngineeringIn**

**Computer Science and Engineering**

Submitted by


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# Lingaraj Appa Engineering College

Gornalli, Bidar-585403


**2022-2023**

# Lingaraj Appa Engineering College

Gornalli, Bidar-585403

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### CERTIFICATE

This is to certify that the project work entitled **"SCI-FI VOICE ASSISTANT"** has been successfully carried out by **MD SHAHBAZ KHAN (3LA19CS013), MD MISBAH MATEEN (3LA19CS012),** and **YASEEN MALIK (3LA19CS019)** a Bonafide work carried out by me at **Lingaraj Appa Engineering College** in partial fulfillment of the requirements for the award of degree in **Bachelor of Engineering in Computer Science and Engineering** of **Visvesvaraya Technological University, Belagavi** during academic year 2022-2023.

| GUIDE | HOD | PRINCIPAL |
|---|---|---|

**EXTERNAL VIVA**

| **Name of the Examiners** | **Signature with Date** |
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| **1.** | |
| **2** | |

# ACKNOWLEDGMENT

The satisfaction that I feel at the successful completion of, **"SCI-FI VOICE ASSISTANT**" would be incomplete if I did not mention the people, whose able guidance and encouragement, crowned my efforts with success. It is my privilege to express my gratitude and respect to all thosewho inspired and helped me in the completion of my project. All the expertise belongs to those listed below.

I express my sincere thanks to our President **Poojya Dr. SharanbaswappaAppaji** and Secretary **Shri. Basavaraj Deshmukh** for providing all the required facilities for the completionof the report

I express my sincere thanks to our beloved Principal **Dr. Vinita . Patil**, LAEC, Bidar for giving me an opportunity to carry out my academic.

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I express my sincere thanks to all the teaching & non-teaching staff of Computer Science and Engineering Department and our friends for their valuable cooperation during the developmentof my report.

Finally, I convey my sweet thanks to my beloved parents who supported me to pursue higher studies and providing me a pleasant environment at home to complete the mini project in time.

DATE :
PLACE :BIDAR

**MD SHAHBAZ KHAN (3LA19CS013)**
**MD MISBAH MATEEN (3LA19CS012)**
**YASEEN MALIK (3LA19CS019)**

# DECLARATION

We, **MD SHAHBAZ KHAN** bearing the USN **3LA19CS013, MD MISBAH MATEEN** bearing the USN **3LA19CS012** and **YASEEN MALIK** bearing USN **3LA19CS013** students of 8th semester B.E, Department of Computer science and Engineering**, LINGRAJ APPA ENGINEERING COLLEGE, BIDAR,** declare that the project report work entitled **"SCI-FI VOICE ASSISTANT",** has been duly executed by us under the guidance of **Prof. SHRUTI MODI,** Asst. Professor, Department of Computer science and Engineering. The project report of the same is submitted in partial fulfillment of the requirements for the award of the degree of Bachelor of Engineering in Computer science and Engineering of **Visvesvaraya Technological University**, during the year 2022-2023.

DATE :
PLACE :BIDAR

**MD SHAHBAZ KHAN (3LA19CS013)**
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**YASEEN MALIK (3LA19CS019)**

# ABSTRACT

The project goal was to “Build Sci-fi AI Voice Assistant Using Python”. The application is created using Jupyter Notebook text software. Python language is used to process the voice assistant to take command and give relevant output. It gave me an opportunity to develop my professional skills and to obtain experience in the industry. It also inspired me to learn new technology and resources that support Python to develop AI application such as Jupyter Notebook. Additionally, it helped me develop my skills in teamwork, communication and time management. I was able to complete my assigned tasks within the prescribed time frame. This Project also gave me the opportunity to apply the knowledge acquired to actual work experiences. The project overall helped me to gain valuable work experience and improved my skills.

# CONTENTS

# LIST OF FIGURES

# CHAPTER 1

# INTRODUCTION

## 1.1 Artificial Intelligence

The AI systems are more generic(rather than specific), can "think" and are more flexible. Intelligence is the ability to acquire and apply knowledge. Knowledge is the information acquired through experience. Experience is the knowledge gained through exposure(training). Summing the terms up, artificial intelligence is the "copy of something natural(i.e., human beings) 'who' is capable of acquiring and applying the information it has gained through exposure."

**Intelligence is composed of:**

- Reasoning
- Learning
- Problem Solving
- Perception
- Linguistic Intelligence

Many tools are used in AI, including versions of search and mathematical optimization, logic, and methods based on probability and economics. The AI field draws upon computer science, mathematics, psychology, linguistics, philosophy, neuroscience, artificial psychology, and many others.

**Need for Artificial Intelligence**

- To create expert systems that exhibit intelligent behaviour with the capability to learn, demonstrate, explain, and advise its users.
- Helping machines find solutions to complex problems like humans do and applying them as algorithms in a computer-friendly manner.

## 1.2 Machine Learning

Machine Learning is the field of study that gives computers the capability to learn without being explicitly programmed. ML is one of the most exciting technologies that one would have ever come across. As it is evident from the name, it gives the computer that makes it more similar to humans: The ability to learn. Machine learning is actively being used today, perhaps in many more places than one would expect.

**Machine Learning Algorithms Are Commonly Used:**

- Neural Networks
- Linear Regression
- Logistic Regression
- Clustering
- Decision Trees
- Random Forests

**Applications of Machine Learning:**

- Speech Recognition
- Customer Service
- Computer Vision
- Recommendation Engines
- Automated Stock Trading
- Fraud Detection

## 1.3 Data Science

Data science is an interdisciplinary field that uses scientific methods, processes, algorithms, and systems to extract or extrapolate knowledge and insights from noisy, structured, and unstructured data, and apply knowledge from data across a broad range of application domains. Data science is related to data mining, machine learning, and big data.

**Components of Data Science:**

- Data Exploration
- Modelling
- Testing the Model
- Deploying Models

**Applications of Data Science:**

- Marketing
- Healthcare
- Banking and Finance
- Government Policies

In AI, ML tools are used in real-time to allow machines to execute their action. ML is an essential tool in the field of AI to develop intelligent agents.

In the field of data science, ML is used as a data analysis tool to unlock patterns in data and to make predictions.

## 1.4 Voice Assistant

Nowadays almost all jobs are done digitally. We have Smartphones in our hands and nothing less than having the world in our hands. These days we don't even use our fingers. We are just talking about work and it is done. There are plans where we can say to the Father of the Scriptures, "I'll be late today." Text is also sent. That is the work of the Voice Assistant.

It also supports specialized functions such as booking a flight, or getting the cheapest book online from various e-commerce sites and provides an order booking link, which facilitates automatic search, discovery, and online ordering services. Voice assistants based on the word need a persuasive word or a wake-up call to make the listener active, which is followed by a command.

In my project the rising name is BUDDY. We have many visible assistants, such as Apple's Siri, Amazon's Alexa, and Microsoft's Cortana. In this project, the wake-up name is selected for BUDDY.

Voice Assistants can provide several services including,

- The weather.
- Scheduling appointment time.
- Trip planning.
- Play music, movies, etc.
- Indicates the time of day.
- Manage emails.
- Open applications.

# CHAPTER 2

## OBJECTIVE

The objective of a voice assistant, in general, is to provide users with a convenient and efficient way to interact with technology and perform various tasks using natural language voice commands. The specific objectives of a voice assistant can vary depending on its application and context, but here are some common objectives:

1. Hands-free and Eyes-free Interaction: A primary objective of a voice assistant is to enable users to interact with technology without using their hands or looking at a screen. By using voice commands, users can perform tasks, access information, and control devices in a more convenient and intuitive manner, especially when their hands are occupied or when visual attention is needed elsewhere.
2. Task Automation and Efficiency: Voice assistants aim to automate and streamline tasks to improve efficiency and save users time and effort. They can perform a wide range of actions such as setting reminders, sending messages, making phone calls, scheduling appointments, playing media, and controlling smart home devices. By automating these tasks through voice commands, users can accomplish them quickly and easily.
3. Information Retrieval and Knowledge Assistance: Voice assistants serve as virtual repositories of information, providing users with quick and convenient access to a wide range of knowledge. Users can ask questions, seek answers, retrieve facts, get weather updates, access news and sports scores, and more. The objective is to provide accurate and relevant information in real-time or near real-time.
4. Personalized Experience: Voice assistants aim to provide a personalized experience by understanding user preferences, habits, and context. By learning from user interactions and data, they can tailor their responses, recommendations, and suggestions to match individual user needs and preferences. This personalization enhances user engagement and satisfaction with the voice assistant.
5. Natural Language Understanding and Communication: Voice assistants strive to understand and interpret natural language voice commands accurately. They employ technologies such as natural language processing (NLP) and machine learning to comprehend user input and generate appropriate responses. The objective is to enable a more conversational and human-like interaction with the voice assistant, making it easier for users to communicate their needs and intentions.
6. Integration with Other Systems and Services: Voice assistants often aim to integrate with various systems, applications, and services to provide seamless experiences across different platforms. This includes integrating with smart home devices, music streaming services, navigation systems, calendars, and more. The objective is to create a unified and interconnected ecosystem where users can access and control multiple services through the voice assistant.

7. Continuous Learning and Improvement: Voice assistants typically incorporate machine learning algorithms to improve their performance over time. They learn from user interactions, feedback, and updates to enhance their understanding, accuracy, and overall user experience. Continuous learning allows voice assistants adapt to user needs, learn new skills, and provide better assistance over time.
8. 

Overall, the objective of a voice assistant is to simplify and enhance users' interactions with technology by providin a natural and intuitive voice-based interface for accessing information, performing tasks, and receiving assistance.

# CHAPTER 3

# METHODOLOGY

This paper explains the voice assistant system which is developed in five parts by five members of team. The first part is listening which works by turning the microphone on and record the command. We used PyAudio module in python to choose microphone and record and save command wav file. The second part is recognition the command from wav file and convert into text. SpeechRecognition module is used to perform this action. The third part is the main part that is text processing for pattern matching to select action. The fourth part is action that is to query and save answer as text. To get answer to user query we used WolframAlpha module . The fifth and final part is covert the text answer to speech. We used PyTtsx3 to perform text- to-speech operation. Other modules like datetime, Wikipedia, webbroweser to perform some basic tasks like open browser, Wikipedia, and data and time.

## 3.1 System Design

A Voice Assistant is a computer system that attempts to understand your voice, answer your question or command, and confirm the action you wanted is done.

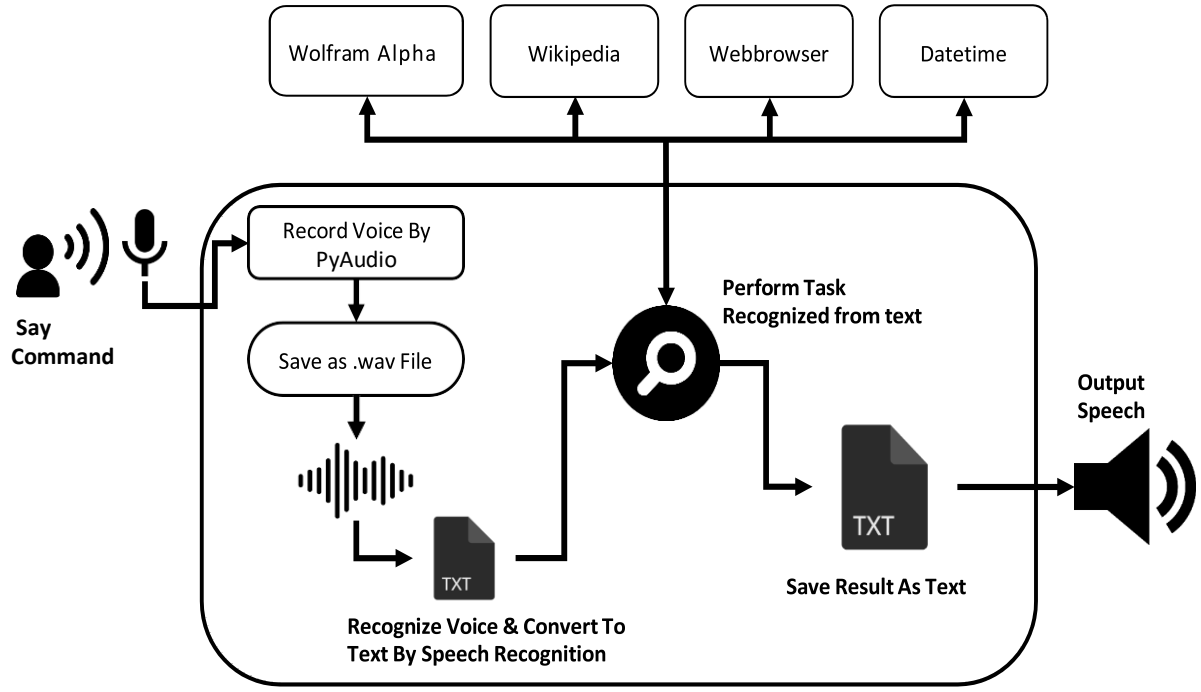


**Fig 3.1: System Design of Voice Assistant**

## 3.2 System Architecture

### 3.2.1 Listen And Save Command

PyAudio provides Python bindings for PortAudio v19, the cross-platform audio I/O library. With PyAudio, you can easily use Python to play and record audio on a variety of platforms, such as GNU/Linux, Microsoft Windows, and Apple macOS.

PyAudio is distributed under the MIT License.

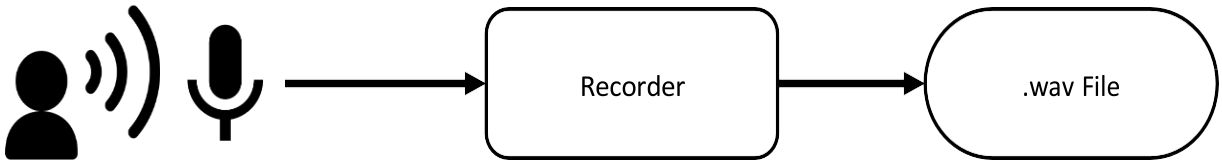


**Fig 3.2: Working of PyAudio module of python**

### 3.2.2 Recognition And Convert Speech To Text

Building an application of voice assistant, one of the most important things in this is that your assistant recognizes your voice (means what you want to say/ ask).

SpeechRecognition is made available under the 3-clause BSD license.

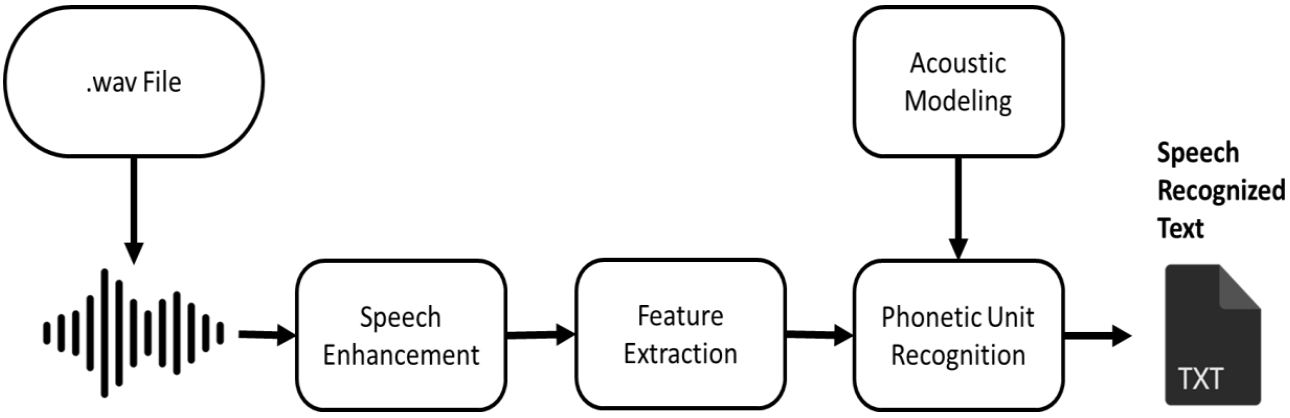


**Fig 3.3: Working of SpeechRecognition module of python**

### 3.2.3 Pattern Matching And Processing Of Recognized Command

Web browser is to perform Web Search and open web applications. Wikipedia is to get information from Wikipedia or to perform a Wikipedia search. Date and Time are used to showing Date and Time.

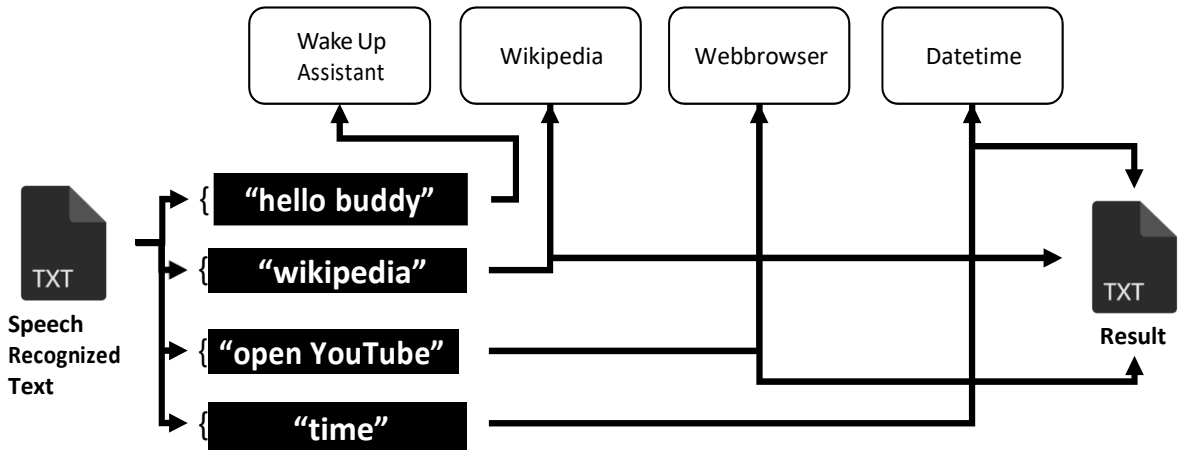


**Fig 3.4 Processing And Pattern Matching**

### 3.2.4 Querying Command And Save Answer As Text

It is used to compute expert-level answers using Wolfram's algorithms, knowledgebase and AI technology.

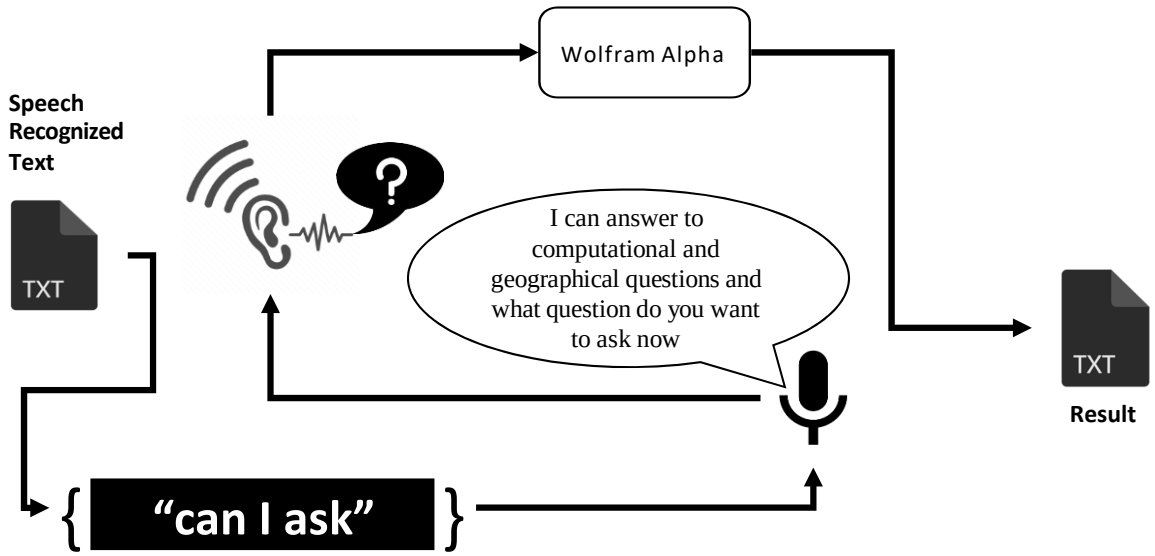


**Fig 3.5: Working of WolframAlpha module of python**

### 3.2.5 Convert Result From Text To Speech

Text to Speech (TTS) library for Python 2 and 3. Works without internet connection or delay. Supports multiple TTS engines, including Sapi5, nsss, and espeak.

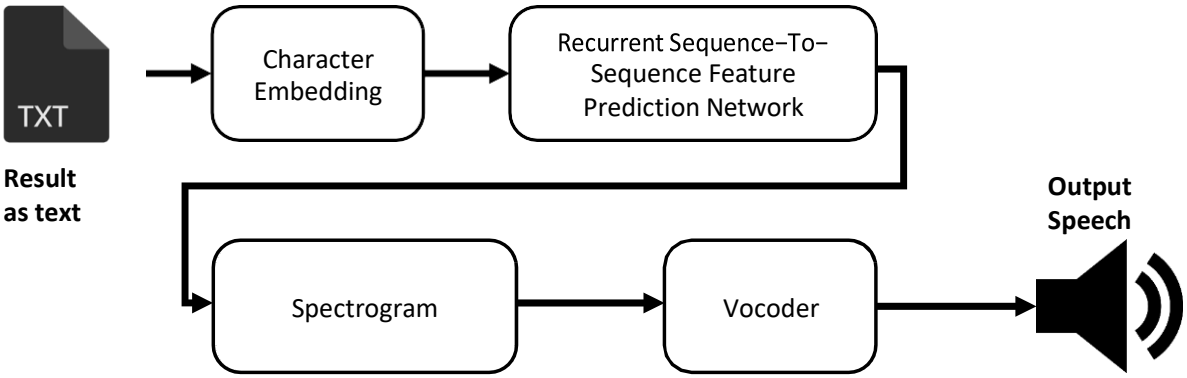


**Fig 3.6: Working of PyTtsx3 module of python**

# CHAPTER 4

# IMPLEMENTATION

## 4.1 Listen And Save Command Implementation

**Step 1:** To listen the command we used pyaudio module open attribute which takes five parameters that is format, channels, rate, input and frames_per_buffer.

```
def listen():
    file = 'Speech' # initialize filename
    CHUNK = 1024
    FORMAT = pyaudio.paInt16
    CHANNELS = 2 #stereo
    RATE = 44100 #common sampling frequency
    RECORD_SECONDS = 5 #change this record for longer or shorter!
    p = pyaudio.PyAudio()
   stream = p.open(format=FORMAT,
                    channels=CHANNELS,
                    rate=RATE,
                    input=True,
                    frames_per_buffer=CHUNK)
    frames = []
    for i in range(0, int(RATE / CHUNK * RECORD_SECONDS)):
        data = stream.read(CHUNK)
        frames.append(data)
   stream.stop_stream()
   stream.close()
   p.terminate()
```

**Step 2:** To save command as wav file we used wave module

```
    wf = wave.open(filename, 'wb')
    wf.setnchannels(CHANNELS)
    wf.setsampwidth(p.get_sample_size(FORMAT))
```

```
    wf.setframerate(RATE)
    wf.writeframes(b''.join(frames))
    wf.close()
    return file
```

## 4.2 Recognition And Convert Speech To Text Implementation

**Step 1:** Record the command from wav file to recognize the speech.

```
def takeCommand():
    r = sr.Recognizer()
    r.energy_threshold = 2500
    file = listen()
    with sr.AudioFile(file) as source:
        audio = r.listen(source)r = sr.Recognizer()
    with sr.AudioFile(filename) as source:
        audio = r.listen(source)
```

**Step 2:** To recognize and save as text

```
    try:
        statement = r.recognize_google(audio,language='en-in')
        #if called:
        print(colored('You:','blue'))
        print(statement+'\n')
    except:
        if called:
            print(colored('Buddy:','green'))
            print("pardon me , please say that again\n")
            speak("pardon me , please say that again")
        return 'none'
    return statement
```

## 4.3 Pattern Matching And Processing Of Recognized Command

**Step 1:** Call function TakeCommand() to get recognized command.

```
if __name__== '_main_':
   while True:

      if called == False and count <3:
         statement = takeCommand().lower()
         if statement=='none':
            count+=1
         elif (called == False) and ('hey buddy' in statement or 'hello buddy' in statement or 'heybuddy' in statement or 'hellobuddy' in statement):
            called = True
            print(colored('Buddy:','green'))
            print("I am Your Voice Assistant buddy\n")
            speak("I am YOUR Voice ASSISTANT buddy")
            wishMe()
            print("Tell me how can I help you now?\n")
            speak("Tell me how can I help you now?")
      elif count >=3:
         break
```

**Step 2:** To pattern match, perform the task and save result as text.

```
      elif called == True:
         statement = takeCommand().lower()
         if statement == 'none':
            continue
            #return
         if "good bye" in statement or "goodbye" in statement or "bye" in statement or "bye" in statement or "stop" in statement:
            sleep = True
            print(colored('Buddy:','green'))
            print('your Voice assistant BUDDY is shutting down,Good bye')
            speak('your Voice assistant BUDDY is shutting down,Good bye')
```

```
    break
if 'wikipedia' in statement:
    print(colored('Buddy:','green'))
    print('Searching Wikipedia...\n')
    speak('Searching Wikipedia...')
    statement =statement.replace("wikipedia", "")

        try:
       results = wikipedia.summary(statement, sentences=3)
       if results:
          print("According to Wikipedia")
          print(results+'\n')
          speak("According to Wikipedia")
          speak(results)
    except:
       print("pardon me , please say that again\n")
       speak("pardon me , please say that again")
elif 'open youtube' in statement:
    webbrowser.open_new_tab("https://www.youtube.com")
    print(colored('Buddy:','green'))
    print("youtube is open for you\n")
    speak("youtube is open for you")
    time.sleep(5)

elif 'open google' in statement:
    webbrowser.open_new_tab("https://www.google.com")
    print(colored('Buddy:','green'))
    print("Google chrome is open for you\n")
    speak("Google chrome is open for you")
    time.sleep(5)
```

```
elif 'open gmail' in statement:
    webbrowser.open_new_tab("gmail.com")
    print(colored('Buddy:','green'))
    print("Google Mail open for you\n")
    speak("Google Mail open for you")
    time.sleep(5)
elif "weather" in statement:
    api_key="8ef61edcf1c576d65d836254e11ea420"
    base_url="https://api.openweathermap.org/data/2.5/weather?"
    print(colored('Buddy:','green'))
    print("what is the city name?\n")
    speak("what is the city name")

    city_name=takeCommand()
    complete_url=base_url+"appid="+api_key+"&q="+city_name
    response = requests.get(complete_url)
    x=response.json()
    if x["cod"]!="404":
        y=x["main"]
        current_temperature = y["temp"]
        current_humidiy = y["humidity"]
        z = x["weather"]
        weather_description = z[0]["description"]
        print(colored('Buddy:','green'))
        speak(" Temperature in kelvin unit is " +
              str(current_temperature) +
              "\n humidity in percentage is " +
              str(current_humidiy) +
              "\n description " +
              str(weather_description))
```

```
            else:
                print(colored('Buddy:','green'))
                print(" City Not Found\n")
                speak(" City Not Found ")
        elif 'time' in statement:
            strTime=datetime.datetime.now().strftime("%H:%M:%S")
            print(colored('Buddy:','green'))
            print(f"the time is {strTime}\n")
            speak(f"the time is {strTime}")
        elif 'who are you' in statement or 'what can you do' in statement:
            print(colored('Buddy:','green'))
            print('I am buddy version 1 point O your Voice assistant. I am programmed to minor
tasks like'
                  'opening youtube,google chrome,gmail and stackoverflow ,predict time,take a
photo,search wikipedia,predict weather'
                  'in different cities , get top headline news from times of india and you can ask me
computational or geographical questions too!\n')
                      am buddy version 1 point O your Voice assistant. I am programmed to minor
tasks like'
speak('I              'opening youtube,google chrome,gmail and stackoverflow ,predict time,take a
photo,search wikipedia,predict weather'
                  'in different cities , get top headline news from times of india and you can ask me
computational or geographical questions too!')
        elif "who made you" in statement or "who created you" in statement or "who discovered
you" in statement:
            print(colored('Buddy:','green'))
            print("I was built by Captain Ali and Team\n")
            speak("I was built by Captain Ali and Team")
        elif 'news' in statement:
            news = webbrowser.open_new_tab ("https://timesofindia.indiatimes.com/home/
headlines ")
            print(colored('Buddy:','green'))
            print('Here are some headlines from the Times of India - Happy reading\n')
            speak('Here are some headlines from the Times of India - Happy reading')
```

```
            time.sleep(7)
time.sleep(3)
```

## 4.4 Querying Command And Save Answer As Text

**Step 1:** To check for “can I ask” in command of recognized command and then call question function.

```
    if 'can I ask' in statement:
            print(colored('Buddy:','green'))
            print(answer)
            speak(answer)
```

**Step 2:** Ask question, process, search and get answer. Save the answer as text.

```
def question():
    print(colored('Buddy:','green'))
    print('I can answer to computational and geographical questions and what question do you want to ask now\n')
    speak('I can answer to computational and geographical questions and what question do you want to ask now')
    question=takeCommand()
    app_id="R2K75H-7ELALHR35X"
    client = wolframalpha.Client('R2K75H-7ELALHR35X')
    res = client.query(question)
    answer = next(res.results).text
    return answer
```

## 4.5 Convert Result From Text To Speech

**Step 1:** To initialization with speech engine, rate of speech and voice gender.

```
engine = pyttsx3.init('sapi5')
voices = engine.getProperty('voices')
engine.setProperty("voice",'voices[0].id')
engine.setProperty('rate', 200)
```

**Step 2:** To speak the text of

```
def speak(text):
    engine.say(text)
    engine.runAndWait()
```

# CHAPTER 5

# SYSTEM REQUIRMENTS

## Hardware

Desktop system or PC with standard specification

## Software

| | | |
|---|---|---|
| Operating system | Windows10Language | Python |
| IDE | Jupyter Notebook | |

# CHAPTER 6

# SNAPSHOTS

## 6.1 Recognizing Call

Say “hello buddy” to wake up the Assistant.

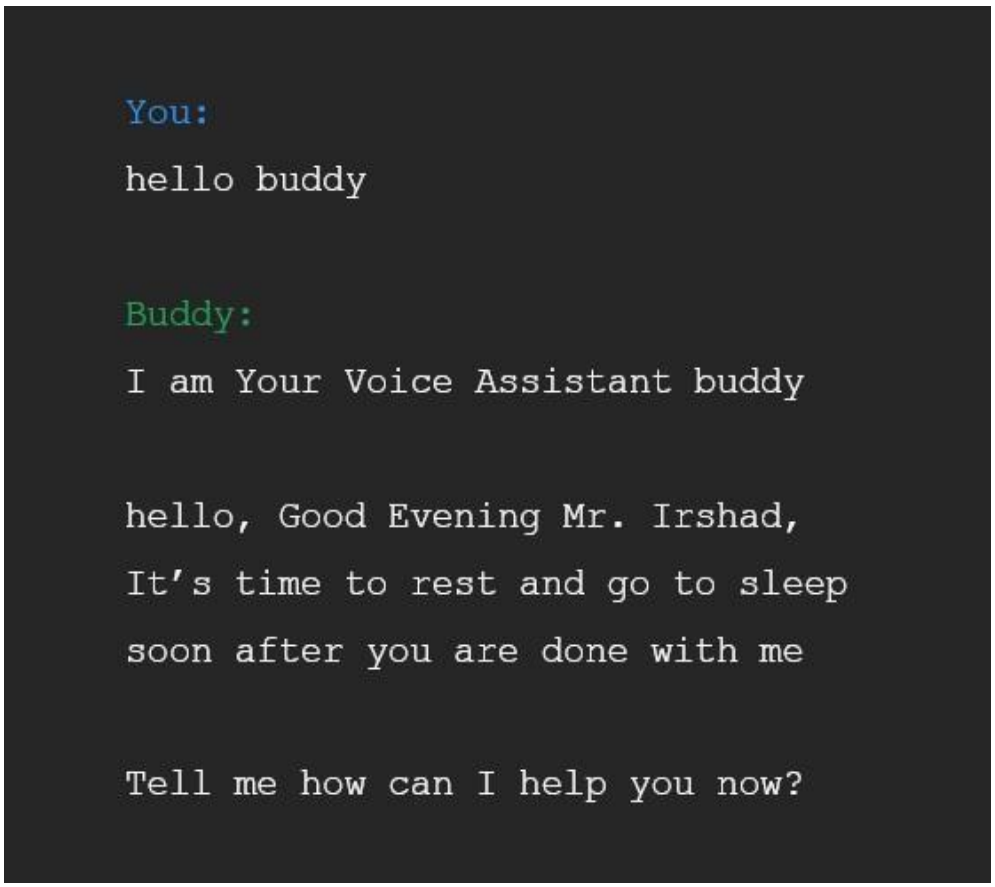


**Fig 6.1:Recognition of Calling Assistant Name**

## 6.2 Wikipedia

Include “Wikipedia“ in your command to get result for Wikipedia. For example, “Sachin Tendulkar from Wikipedia”.

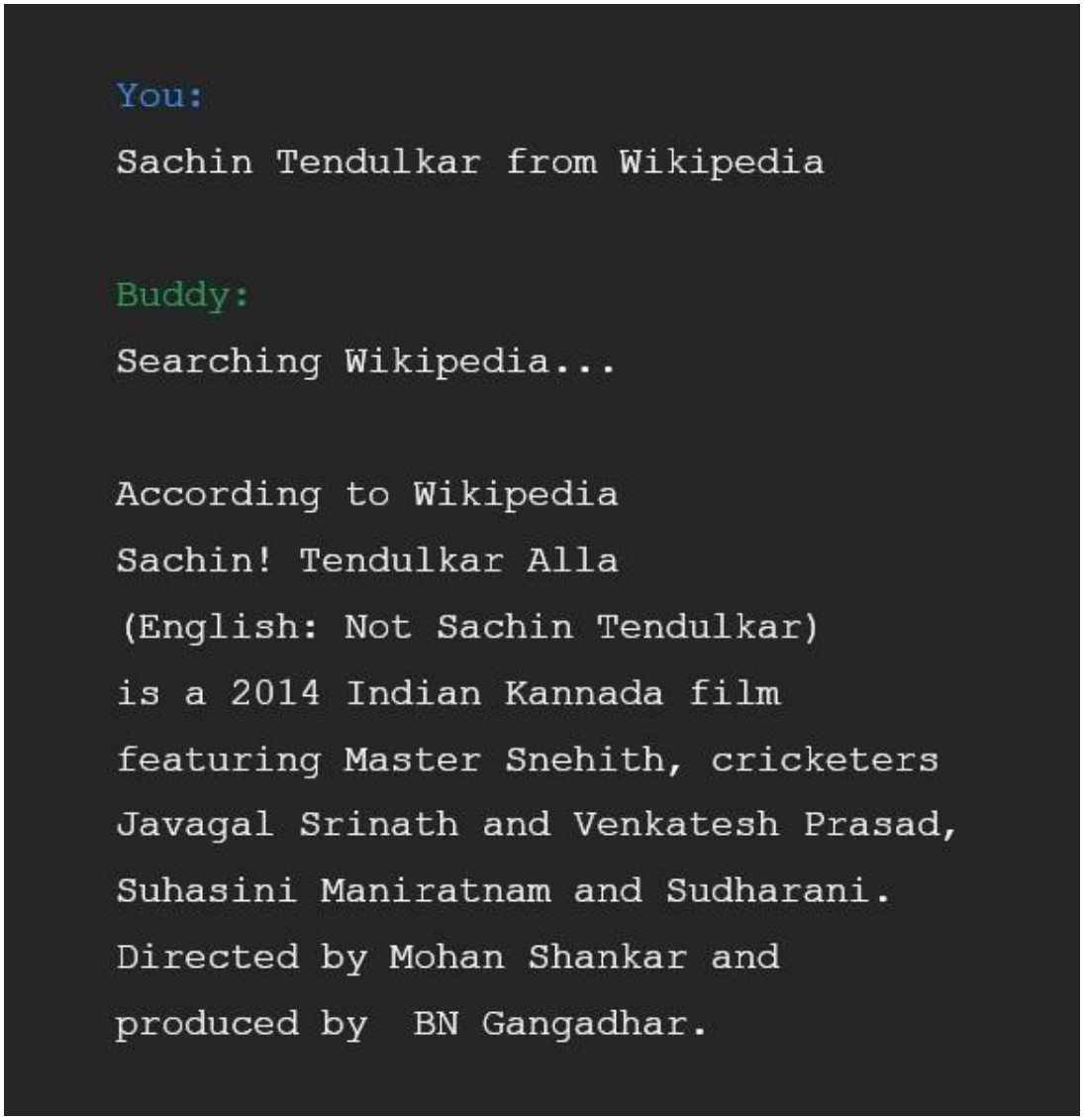


**Fig 6.2:Search of Wikipedia**

## 6.3 Open App Commands

To open YouTube, Google or Gmail , Say “open” with them. For example, “Open YouTube”.

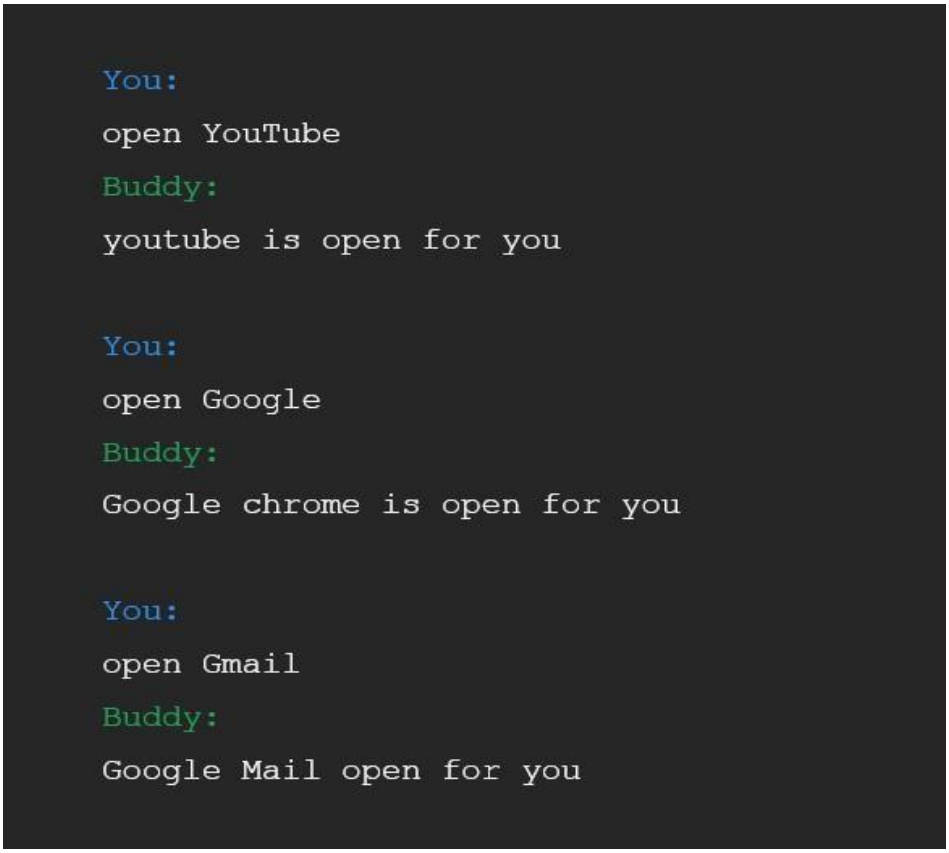


**Fig 6.3:Commad to Open Application**

## 6.4 Weather Report

Ask “weather” to get current weather report of city. Assistant ask for city name and then report the weather condition of mentioned city.

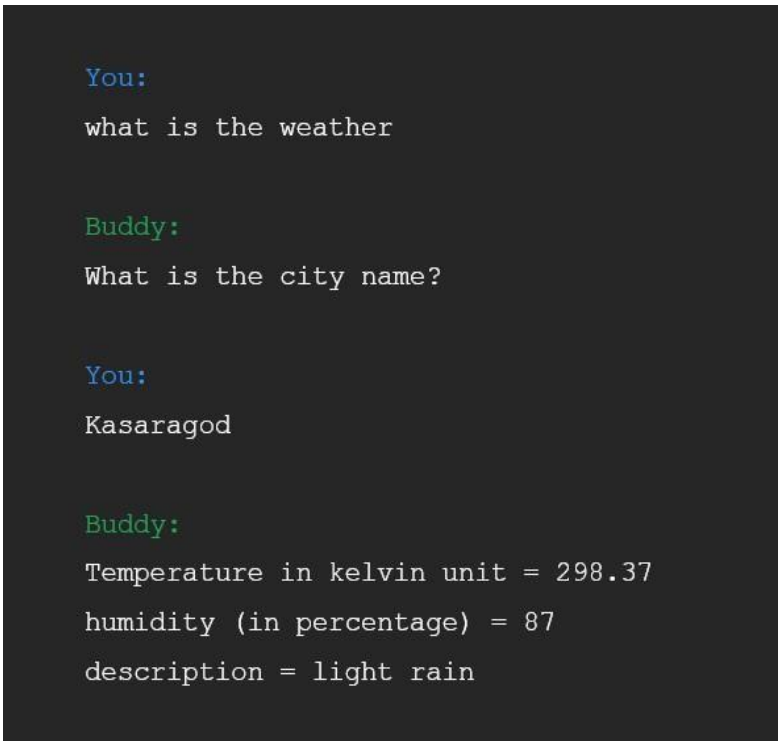


**Fig 6.4:Command to Report Weather**

## 6.5 Assistant Information

"who are you" command gives self-description of assistant to its user.


**Fig 4.5:Assistant Self-Introduction**

"who made you" command gives developer name.


**Fig 6.6:Assistant Developer**

## 6.6 Question and Turn Off Assistant

Say “can I ask” to ask any question to assistant and say “bye” to turn off the system.

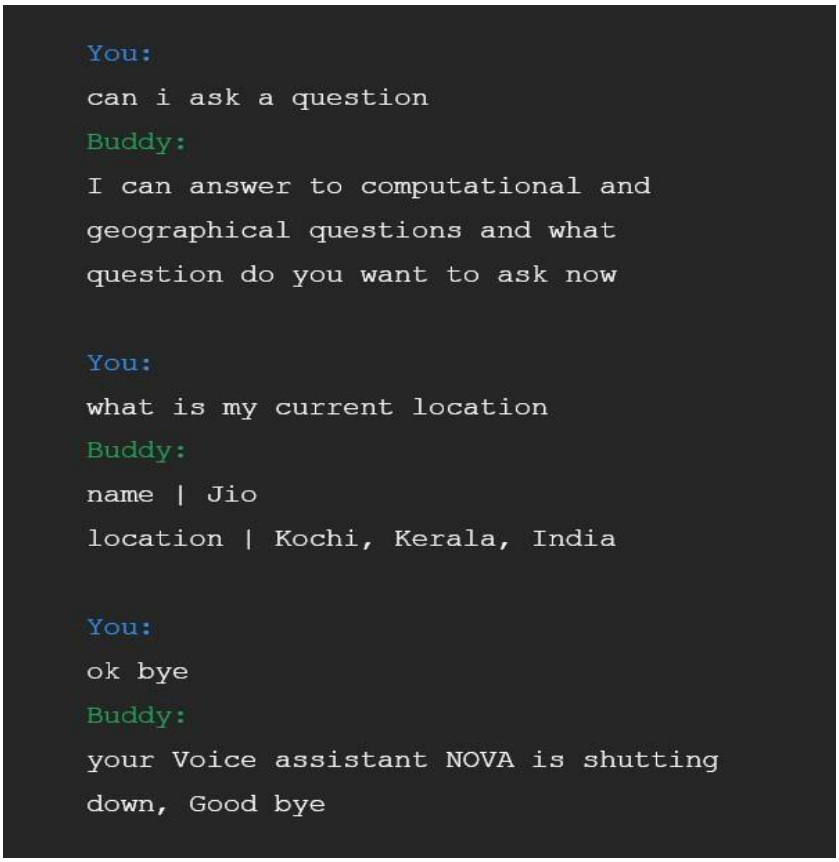


**Fig 6.7: Question Assistant and Command to Turn Off**

# CHAPTER 7

# REFLECTION NOTES

## 7.1 Learnt from the internship program

During the internship period, I had hands-on experience with real-time projects. It helped me improve my technical skills and work on navigator. The open exposure to the company helped me in increasing my knowledge.

**Work Experience**:

My internship was quite satisfactory in terms of work environment. The team I worked with was very friendly and helped me a lot in all my problems.

**Team Work:**

In this project, 4 people worked together thus providing enough opportunity for proper teamwork and coordination. This was a good experience for me as the team was very cooperative and understanding.

**Responsibility and keeping commitments:**

The importance of honoring commitments and time of other was an important thing which I learnt from this internship

## 7.2 Technical Outcomes

7.2.1 Working with Jupyter Notebook

7.2.2 Hands on experience with projects

## 7.3 Non-technical Outcomes

### 7.3.1 Verbal and Written Communication Skills:

I have demonstrated and learnt my strong communication skills, both verbal and written, throughout my internship, while working for training program and development.

### 7.3.2 Personality Development:

Personality development plays an imperative role at workplace as it decides the way an individual interacts with his/her fellow workers and responds to various situations. Personality development also reduces stress levels and teaches an individual to face even the worst situation with a smile

### 7.3.3 Time Management:

Proper time management in the work place has a number of positive effects, ranging from making you a more focused and valuable employee to reducing the stress of your job. Time is a precious commodity on any job. Employees who can get the maximum amount of good work done in the minimum amount of time are more appreciated. It also strengthens the relationship among co-workers.

### 7.3.4 Resource Utilization Skills:

Effective management of resources is an essential task for companies that are managing different projects. It is important for them to efficiently organize and allocate personal as well as equipment for different projects, same time avoiding idle resources. Having the information about the availability of the resource and have them available at the right time for the activities plays a vital role in managing the costs and smoothly executing the project activities

# CONCLUSION

This internship has been an excellent and rewarding experience. I can conclude that there havebeen a lot I've learnt from my Internship at AiRobosoft Product and Services LLP. It was good opportunity to improve my personal and professional skills. I believe my time spent in the company made me learn new things. This internship helped me to develop my knowledge, skills and abilities. Over all it was a complete useful experience in AiRobosoft Product and Services LLP to study on Build Sci-Fi AI Voice Assistant Using Python.

Internship project "Build Sci-Fi AI Voice Assistant Using Python" was carried out as team offive, where my role was to implement pyaudio module. It is a very useful module in python, which can be used for voice recording and save. It is also use to play recorded voice. This project is a simple assistant that can be used to perform basis tasks like get information from Wikipedia, web browser, etc. It can also used to get weather report of city and time.

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