1 INTRODUCTION

1.1 INTRODUCTION

Artificial Intelligence when used with machines, it shows us the capability of thinking like humans. In this, a computer system is designed in such a way that typically requires interaction from human. As we know Python is an emerging language so it becomes easy to write a script for Voice Assistant in Python. The instructions for the assistant can be handled as per the requirement of user. Speech recognition is the Alexa, Siri, etc. In Python there is an API called Speech Recognition which allows us to convert speech into text. It was an interesting task to make my own assistant. It became easier to send emails without typing any word, Searching on Google without opening the browser, and performing many other daily tasks like playing music, opening your favourite IDE with the help of a single voice command. In the current scenario, advancement in technologies are such that they can perform any task with same effectiveness or can say more effectively than us. By making this project, I realized that the concept of AI in every field is decreasing human effort and saving time.

As the voice assistant is using Artificial Intelligence hence the result that it is providing are highly accurate and efficient. The assistant can help to reduce human effort and consumes time while performing any task, they removed the concept of typing completely and behave as another individual to whom we are talking and asking to perform task. The assistant is no less than a human assistant but we can say that this is more effective and efficient to perform any task. The libraries and packages used to make this assistant focuses on the time complexities and reduces time.

The functionalities include , It can send emails, It can open command prompt, your favourite IDE, TextEdit etc., It can play music, It can do Wikipedia searches for you, It can open websites like Google, YouTube, etc., in a web browser, It can give weather forecast, It can give desktop reminders of your choice. It can have some basic conversation.

Tools and technologies used are PyCharm IDE for making this project, and I created all py files in PyCharm. Along with this I used following modules and libraries in my project. pyttsx3, SpeechRecognition, Datetime, Wikipedia, Smtplib, pywhatkit, pyjokes, etc

1.2 EXISTING SYSTEM

The current voice assistant system basically existing on Windows OS is the Cortana which is completely online based system and requires high speed fast internet and also a regular Microsoft account for login and other existing system is Ok-Google voice assistant which is browser dependent.

Need Of Virtual Assistant

- Time-saving
- 24x7 Availability
- Handicapped person can also use

2. PROPOSED SYSTEM

2.1 PROBLEM STATEMENT

In virtual assistant we are all well aware about Cortana, Siri, Google Assistant and many other virtual assistants which are designed to aid the tasks of users in Windows, Android and iOS platforms. But to our surprise, there's no such complete virtual assistant available for Mac os platform consisting of 70% of the users. So, this is actually a major problem for users where there could be internet instability, server problems and places where internet is not accessible.

2.2 PROPOSED SYSTEM

The following features will be included in the proposed system:

1) The system will continue to listen for commands, and the length of time it spends listening is adjustable to meet the needs of the user.

2) If the system is unable to extract information from the user's input, it will prompt the user to repeat the process until the desired number of times has been reached.

3) The system will be voiced by a men.

4) Playing music, sending emails, searching Wikipedia, accessing system-installed applications, opening anything in the web browser, and so on are all supported in the present edition.

2.3 OPERATING ENVIRONMENT

Software and Hardware Requirement -

Processor:- Apple M1,intel i5 3 generation

Memory:- 8GB

Operating system:- Window,Mac os

Software:- Must installed python 3.11

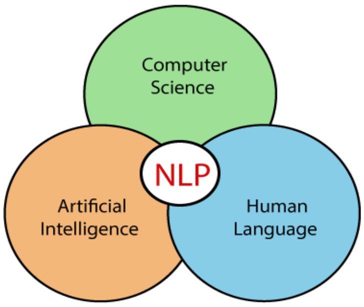
IDE:- JetBrains PyCharm

2.4 BRIEF DESCRIPTION OF TECHNOLOGY USED

The **Artificial Intelligence-Powered Virtual Assistant** uses advanced Artificial Intelligence (AI), RPA, natural language processing, and machine learning to extract information and complex data from conversations to understand them and process them accordingly.

Python-Python is a computer programming language often used to build websites and software, automate tasks, and conduct data analysis. Python is a general-purpose language, meaning it can be used to create a variety of different programs and isn't specialized for any specific problems.

NLP-NLP stands for Natural Language Processing, which is a part of Computer Science, Human language, and Artificial Intelligence. It is the technology that is used by machines to understand, analyse, manipulate, and interpret human's languages. It helps developers to organize knowledge for performing tasks such as translation, automatic summarization, Named Entity Recognition (NER), speech recognition, relationship extraction**,** and topic segmentation.



Speech Recognition:-is an important feature in several applications used such as home automation, artificial intelligence, etc. This article aims to provide an introduction to how to make use of the SpeechRecognition library of Python. This is useful as it can be used on microcontrollers such as Raspberry Pi with the help of an external microphone.

2.5. LIBRARY USED

Subprocess:- This module is used for getting system subprocess details which are used in various commands i.e Shutdown, Sleep, etc. This module comes built-in with Python.

pyttsx3:- pyttsx3 is a text-to-speech conversion library in Python. It works offline and is compatible with python like Python 2 and 3 works without internet connection or delay. The text-to-speech features for this pyttsx3 module are based on python languages installed in your operating system. It is a very easy to use tool which converts the entered text into speech.

Speech recognition:- Speech recognition means that when humans are speaking, a machine understands it. In our project we are using Google Speech API in Python to make software which is used to run machines on command. We need to install the Pyaudio python package for recognize the voice commands. Pyaudio can be installed by using pip install Pyaudio command.

Datetime:- Datetime package is used to showing Date and Time. This datetime module comes built-in with Python.

Wikipedia:- Wikipedia module in our project to get more information from Wikipedia or to perform a Wikipedia search. To install this Wikipedia module use pip install wikipedia.

webbrowser:- To perform Web Search. This module comes built-in with Python.

OS:- The OS module in Python provides functions for interacting with the operating system. OS comes under Python’s standard utility modules. This module provides a portable way of using operating system dependent functionality.

Pyjokes:- Pyjokes is used for collection Python Jokes over the Internet. Pyjokes is add in our project because it adds jokes in our project . It is very interesting. Pyjokes is the one line joke which makes our project interesting.

Smtplib:- The smtplib is a Python library for sending emails using the Simple Mail Transfer Protocol (SMTP). The smtplib is a built-in module in python; do not need to install it. It abstracts away all the complexities of SMTP. It provides a Simple Mail Transfer Protocol (SMTP) client implementation.

Ecapture:- To capture images from your Camera. To install this module type the below command in the terminal.

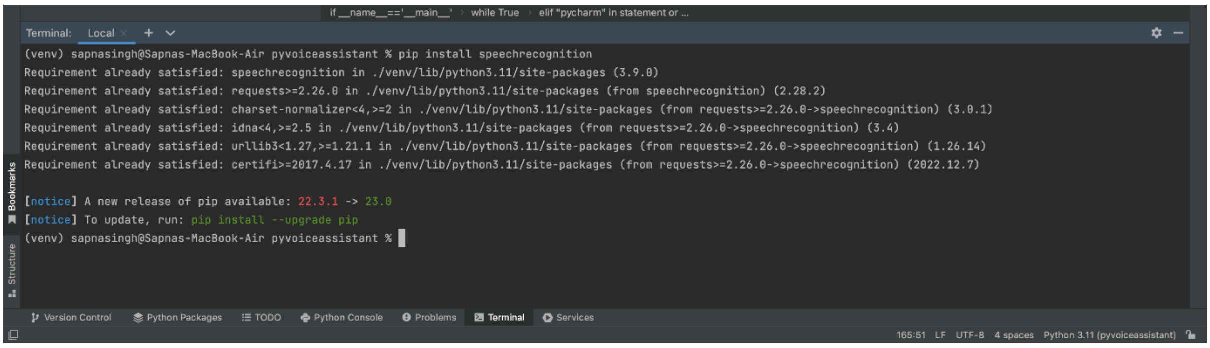
Pywhatkit:-PyWhatKit is a Python library with various helpful features. It's easy-to-use and does not require you to do any additional setup. Currently, it is one of the most popular library for WhatsApp and YouTube automation. New updates are released frequently with new features and bug fixes.

Pyaudio:- PyAudio is a Python library that is used for audio input and output..PyAudio is a set of Python bindings for PortAudio, a cross-platform C++ library interfacing with audio drivers.

Requests:- Requests module allows u to send http requests using python. Requests is used for making GET and POST requests. It abstracts the complexities of making requests behind a beautiful, simple API.

Install Python Package

Ex:- install SpeechRecognition module


if __name__=='__main__' › while True › elif "pycharm" in statement or ...
Terminal: Local
Bookmarks
Structure
Version Control
Python Packages
TODO
Python Console
Problems
Terminal
Services
165:51 LF UTF-8 4 spaces Python 3.11 (pyvoiceassistant)

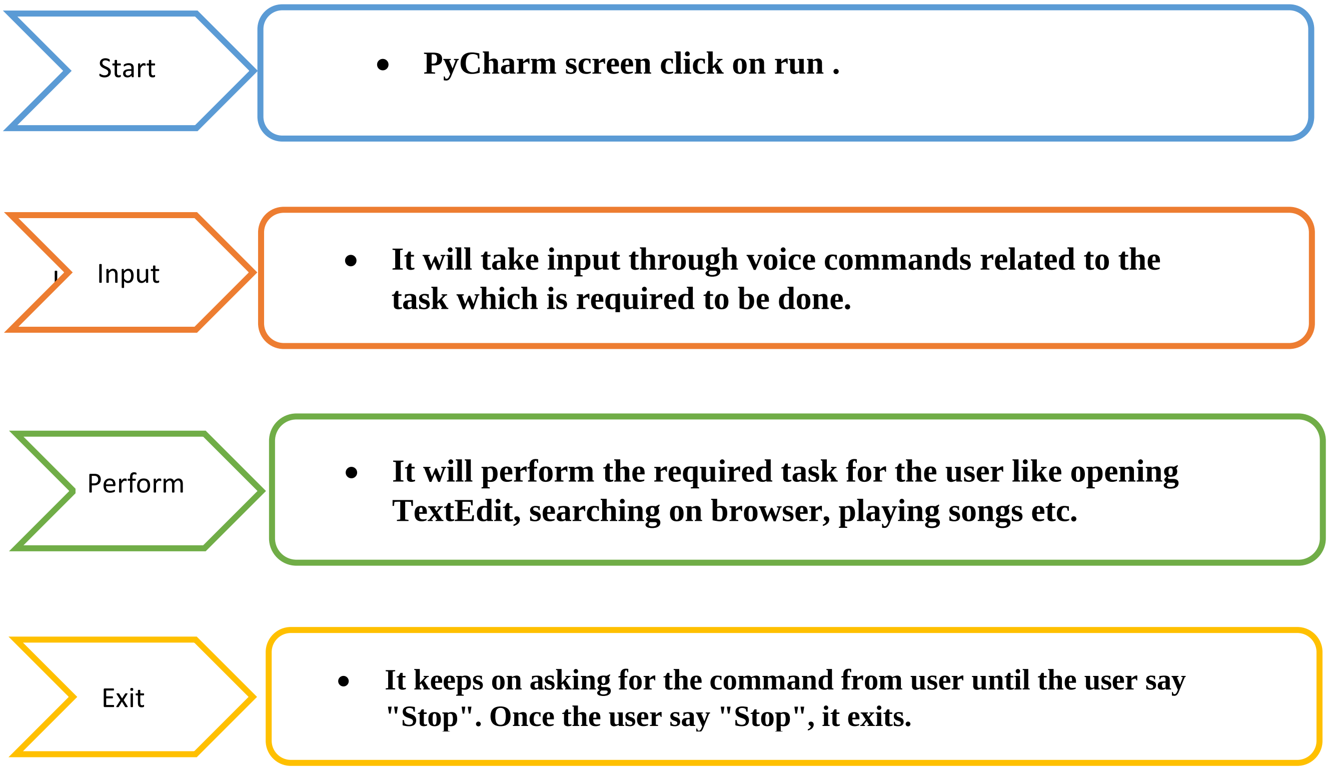
```
(venv) sapnasingh@Sapnas-MacBook-Air pyvoiceassistant % pip install speechrecognition
Requirement already satisfied: speechrecognition in ./venv/lib/python3.11/site-packages (3.9.0)
Requirement already satisfied: requests>=2.26.0 in ./venv/lib/python3.11/site-packages (from speechrecognition) (2.28.2)
Requirement already satisfied: charset-normalizer<4,>=2 in ./venv/lib/python3.11/site-packages (from requests>=2.26.0->speechrecognition) (3.0.1)
Requirement already satisfied: idna<4,>=2.5 in ./venv/lib/python3.11/site-packages (from requests>=2.26.0->speechrecognition) (3.4)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in ./venv/lib/python3.11/site-packages (from requests>=2.26.0->speechrecognition) (1.26.14)
Requirement already satisfied: certifi>=2017.4.17 in ./venv/lib/python3.11/site-packages (from requests>=2.26.0->speechrecognition) (2022.12.7)

[notice] A new release of pip available: 22.3.1 -> 23.0
[notice] To update, run: pip install --upgrade pip
(venv) sapnasingh@Sapnas-MacBook-Air pyvoiceassistant %
```

3. SYSTEM ANALYSIS AND DESIGN

3.1 DATA FLOW

The data flow for JARVIS is as follow:



Start

- **PyCharm screen click on run .**

Input

- **It will take input through voice commands related to the task which is required to be done.**

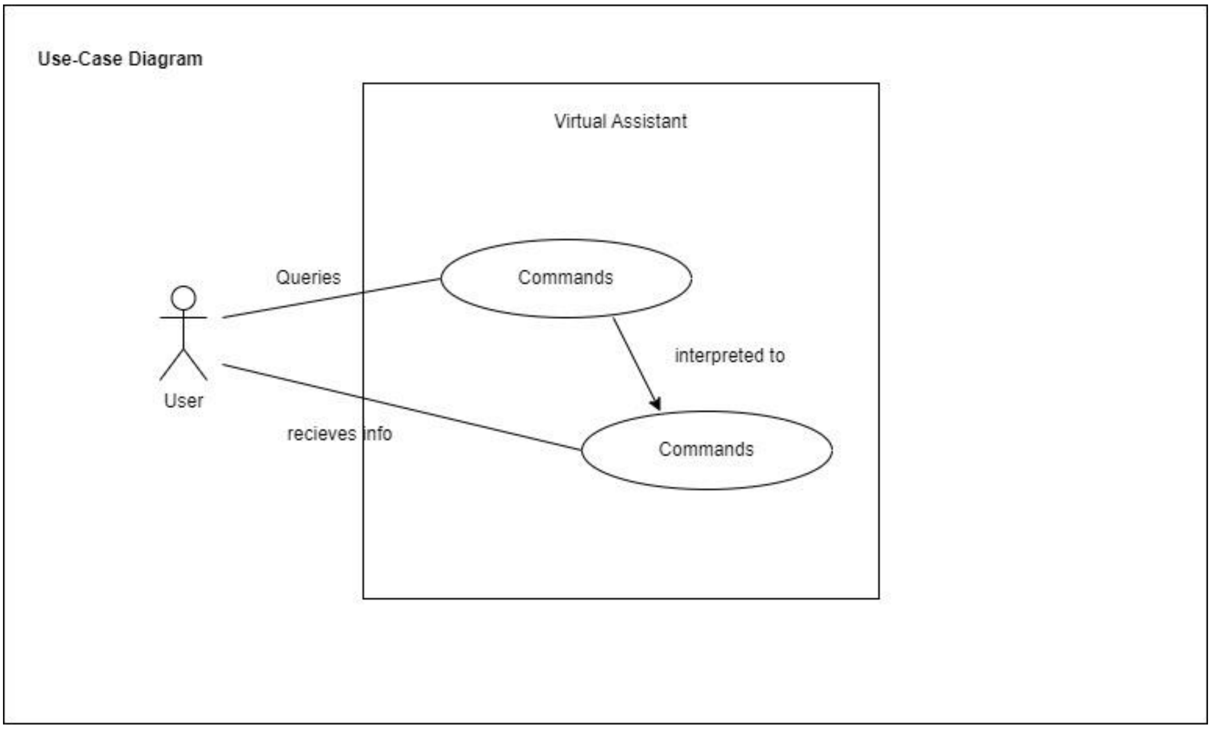
Perform

- **It will perform the required task for the user like opening TextEdit, searching on browser, playing songs etc.**

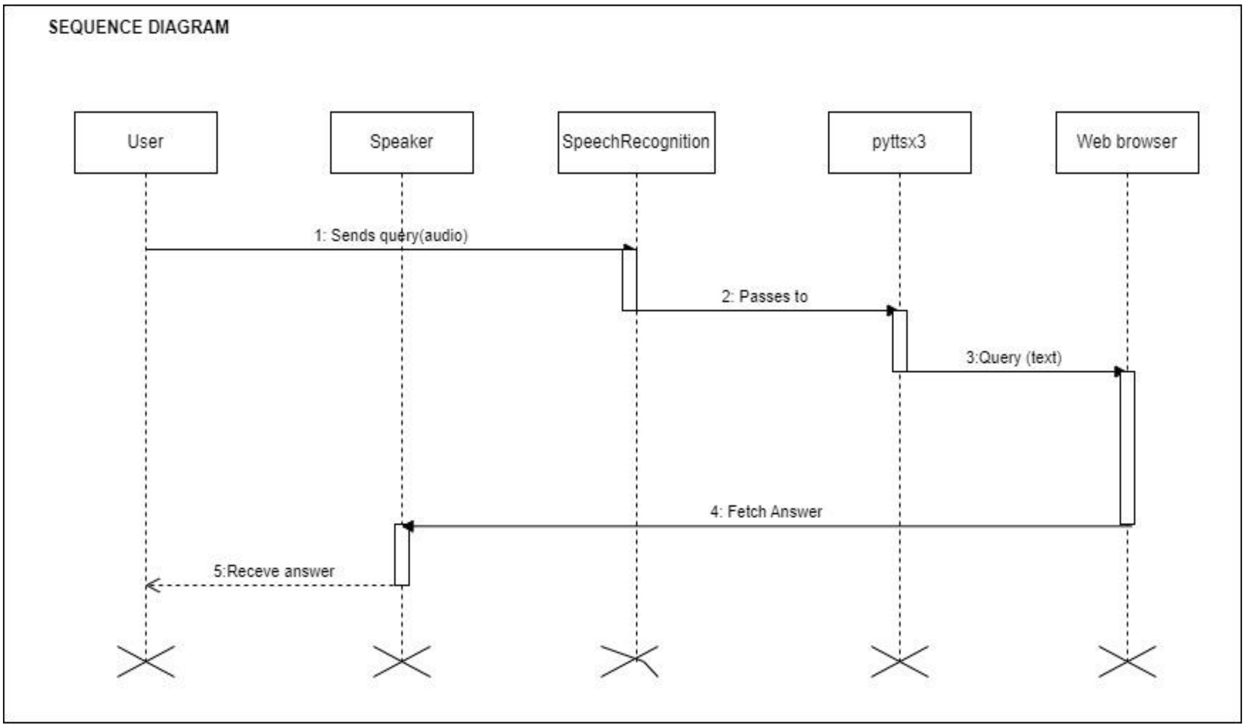
Exit

- **It keeps on asking for the command from user until the user say "Stop". Once the user say "Stop", it exits.**

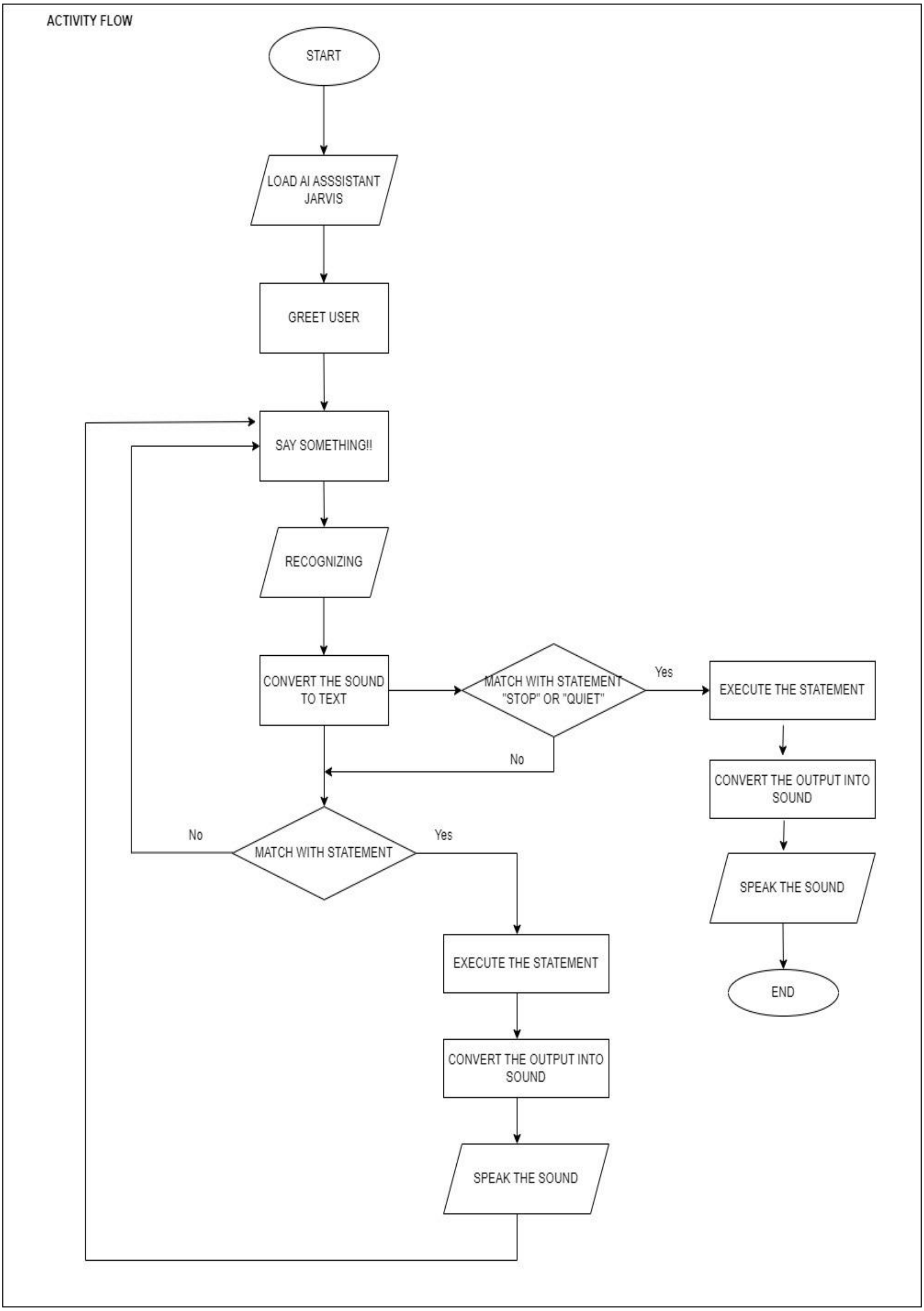
3.2 Use-Case Diagram



3.3 Sequence Diagram



3.3 Activity Diagram



4. CODE AND IMPLEMENTATION

```
# import the library needed for the virtual assistant
import webbrowser
import speech_recognition as sr
import pyttsx3
import wikipedia
import time
import datetime
import pyjokes
from ecapture import ecapture as ec
import pywhatkit as kt
import subprocess
import smtplib
import requests

print('Loding your AI personal assistant Jarvis')
engine = pyttsx3.init()


def wishMe():
    hour = datetime.datetime.now().hour
    if hour >= 0 and hour < 12:
        speak("Hello,Good Morning")
        print("Hello,Good Morning")
    elif hour >= 12 and hour < 18:
        speak("Hello,Good Afternoon")
        print("Hello,Good Afternoon")
    else:
        speak("Hello,Good Evening")
        print("Hello,Good Evening")


# now, let us obtain voice input from the microphone
def takeCommand():
    r = sr.Recognizer()
    with sr.Microphone() as source:
        print("Say something...!")
        audio = r.listen(source)
        try:
            print("Recognizing")
            statement = r.recognize_google(audio, language='en-in')
            print("I heard you say " + statement)
        except Exception as e:
            print("Hey, I could not understand what you say")
            return "None"
        return statement
```

```
# the engine will then repeat what you said before performing your command
def speak(text):
    engine.say(text)
    engine.runAndWait()


def sendEmail(to, content):
    server = smtplib.SMTP('smtp.gmail.com', 587)
    server.ehlo()
    server.starttls()
    server.login('mi@gmail.com', 'password')
    server.sendmail('sapana@gmail.com', to, content)
    server.close()


if __name__ == '__main__':
    wishMe()
    while True:
        speak("Tell me how can i help you now?")
        statement = takeCommand().lower()
        if statement == 0:
            continue

        if "stop" in statement or "okay bye" in statement or "goodbye" in statement or "quit" in statement:
            speak('Your personal assistant jarvis is shutting down,Good bye')
            print('Your personal assistant jarvis is shutting down,Good bye')
            break
        if 'wikipedia' in statement:
            speak('Searching wikipedia...')
            statement = statement.replace("wikipedia", "")
            results = wikipedia.summary(statement, sentences=3)
            speak("According to Wikipedia")
            print(results)
            speak(results)
        elif 'open youtube' in statement:
            webbrowser.open_new_tab("https://www.youtube.com")
            speak("Youtube is open now")

        elif 'open google' in statement:
            webbrowser.open_new_tab("https://www.google.com")
            speak("Google chrome open now")

        elif 'open gmail' in statement:
            webbrowser.open_new_tab("https://www.gmail.com")
            speak("Gmail website is open now")

        elif 'tell jokes' in statement or 'joke' in statement:
            speak(pyjokes.get_joke())
            print(pyjokes.get_joke())

        elif 'time' in statement:
            strTime = datetime.datetime.now().strftime("%H:%M:%S")
            speak(f"the time is {strTime}")

        elif 'who are you' in statement or 'what can you do' in statement:
            speak('I am jarvis version 1 point O your personal 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 etc')

        elif "who made you" in statement or "who created you" in statement or "who
discovered you" in statement:
            speak("I was built by Sapna Singh")
            print("I was built by Sapna Singh")

        elif "open stackoverflow" in statement:
            webbrowser.open_new_tab("https://stackoverflow.com/login")
            speak("Here is stackoverflow")

        elif 'news' in statement:
            news =
webbrowser.open_new_tab("https://timesofindia.indiatimes.com/home/headlines")
            speak('Here are some headlines from the Times of India,Happy reading')
            time.sleep(6)


        elif 'search' in statement:
            statement = statement.replace("search", "")
            kt.search(statement)
            # webbrowser.open(statement)
            time.sleep(5)

        elif 'play' in statement:
            statement = statement.replace("play", "")
            # ebbrowser.open(f'https://open.spotify.com/search/{statement}')
            # time.sleep(13)
            engine.say("playing" + statement)
            engine.runAndWait()
            kt.playonyt(statement)
            # time.sleep(120)
            break
            # engine.runAndWait()
            # pyautoqui.click(x=1055, y=617)
            # speak('Playing' + song)
```

```
elif "open calculator" in statement:
    speak("Calculator opening...")
    subprocess.Popen(['open', '-a', 'Calculator'])

elif 'email to sapna' in statement:
    try:
        speak("What should I say?")
        content = takeCommand()
        to = "sapna@gmail.com"
        sendEmail(to, content)
        speak("Email has been sent!")
    except Exception as e:
        # print(e)
        speak("Sorry . I am not able to send this email")

elif "open camera" in statement:
    speak(" Camera opening...")
    subprocess.Popen(['open', '-a', 'Photo Booth'])

elif "camera" in statement or "take a photo" in statement:
    ec.capture(0, "robo camera", "img.jpg")

elif "open map" in statement:
    speak(" Map is opening...")
    subprocess.Popen(['open', '-a', 'Maps'])

elif "open calender" in statement:
    speak(" Calender opening...")
    subprocess.Popen(['open', '-a', 'Calendar'])

elif "open mail" in statement or "open mail app" in statement:
    speak(" Mail is opening...")
    subprocess.Popen(['open', '-a', 'Mail'])

elif "weather" in statement or "tell weather" in statement or "climate" in statement:
    api_key = "8ef61edcf1c576d65d836254e11ea420"
    base_url = "https://api.openweathermap.org/data/2.5/weather?"
    speak("whats 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"]
        speak(" Temperature in kelvin unit is " +
              str(current_temperature) + "\n humidity in percentage is " + str(
                    current_humidiy) + "\n description  " + str(weather_description))
                print(" Temperature in kelvin unit = " + str(
                    current_temperature) + "\n humidity (in percentage) = " + str(
                    current_humidiy) + "\n description = " + str(weather_description))

            else:
                speak(" City Not Found ")

        elif "i love you" in statement:
            speak("Thank you! But, It's a pleasure to hear it from you.")

        elif "write a note" in statement:
            speak("What should i write, madam")
            note = takeCommand()
            file = open('jarvis.txt', 'w')
            speak("Sir, Should i include date and time")
            snfm = takeCommand()
            if 'yes' in snfm or 'sure' in snfm:
                strTime = datetime.datetime.now().strftime("% H:% M:% S")
                file.write(strTime)
                file.write(" :- ")
                file.write(note)
            else:
                file.write(note)

        elif "how are you" in statement:
            speak("I am fine")

        elif "what is the fees of MCA course" in statement:
            speak("42000 Rupees")

        elif "placement detail" in statement or "tell about a placement detail" in statement:
            speak('Placements for our batch and the seniors batch were not at all good. None of
our college friends '
                  'was placed through the college. About 20% of students got internships from
the college. The '
                  'highest stipend offered was Rs 18,000 for 6 months, and the lowest was a free
internship. There is '
                  'a placement cell in the college, but its not useful enough.')

        elif "tell me about college infrastructure" in statement:
            speak('The facilities of the college are amazing. We had Wi-Fi all over the campus.
Its a 100 acres '
                  'campus with all the facilities. The college has 2 football/cricket grounds,
swimming pool, '
                  'and inhouse medical facilities. As there is hotel management on the campus,
we had a mini hotel '
                  'kind of a canteen and had a variety of dishes available in the canteen. I did not
face any '
                  'infrastructure related issues during my college time.')
```

```
    elif "founder of dy patil" in statement:
        speak('Ajeenkya D Y Patil was born in Mumbai, the son of Pushpalata Patil and D.
Y. Patil, a Padma Shri '
              'recipient, and founder of the D Y Patil Group.')

    elif "tell about faculty member of mca" in statement:
        speak('Prof. Ashok Deokar Assistant Professor and Head Of Department in MCA'
              'Prof. Sapna Chavan Assistant Professor'
              'Prof. Shubham Wadpalliwar Assistant Professor'
              'Dr Jayshri Patil    Assistant Professor '
              'Prof. Santosh S. Deshmukh Assistant Professor'
              'Prof. Hidayat Pirjade Assistant Professor'
              'Prof. Urmila Kadam Assistant Professor'
              'Prof. Asmita Hendre Assistant Professor '
              'Prof. Ravikant D. Kale Assistant Professor '
              'Mrs. Ashwini Dolas Librarian')

    elif "what is mca" in statement:
        speak('M.C.A (Master of Computer Application ) is generally a 3-year post
graduate degree / diploma in '
              'Computer Applications. In some institutes it is called PGDCA, PGDIT etc.')

    elif "what is the eligibility criteria for mca course" in statement:
        speak('Bachelor Degree of 3 years duration and should have studied Maths / Stats /
Business Stats / '
              'Computer Science / Computer Programming either at degree level or 10+2
level with Minimum 50% '
              'marks in aggregate of all the years of degree examination.')

    elif "mca course duration" in statement:
        speak('2 years')

    elif "what are the subjects in mca" in statement:
        speak('MCA subjects include topics like java,data structure,networking,advance
web technology,python,'
              'Artifical intelligence,Android,software testing,cloud computing etc ')

    elif "tell about hostel" in statement:
        speak('Hostel Fee Details:Minimum amount as per room being availed, before
leaving the Hostel.(a) '
              'Standard Rooms - Rs. 50,000 (b)Premium Rooms - Rs. 60,000 (c)Premium
Plus Rooms - Rs. 80,'
              '000 (d) Supreme Rooms - Rs. 90,000')
```

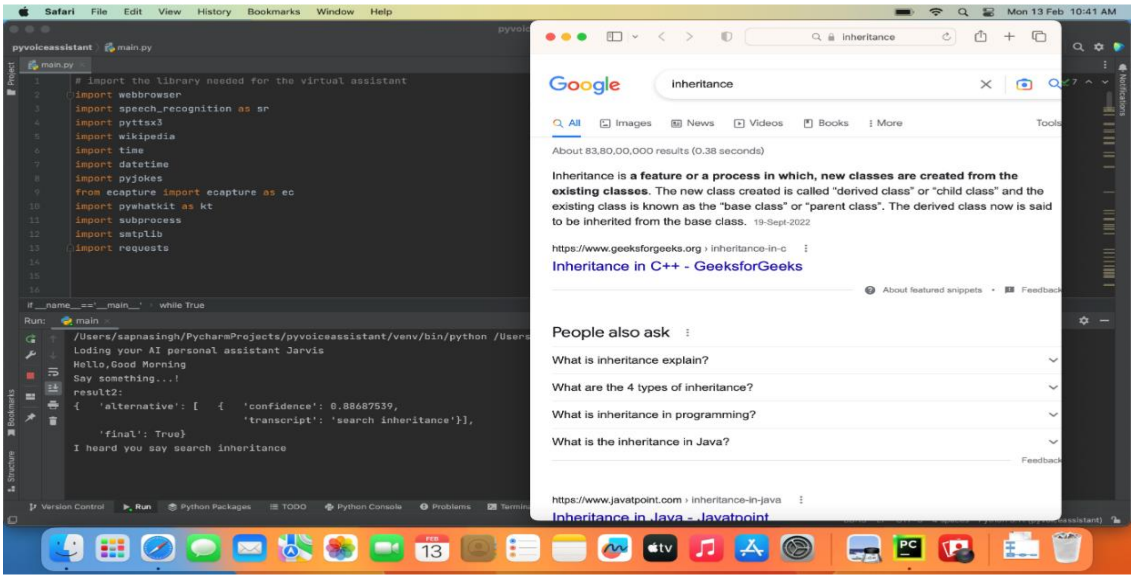
Implémentation

Listening

Say something..!

The command is printed =search inheritance

Open webbrowser Listening and Recognizing



Safari File Edit View History Bookmarks Window Help
Mon 13 Feb 10:41 AM
pyvoiceassistant main.py
if __name__=='__main__' while True
Run: main
Version Control Run Python Packages TODO Python Console Problems Terminal

```python
# import the library needed for the virtual assistant
import webbrowser
import speech_recognition as sr
import pyttsx3
import wikipedia
import time
import datetime
import pyjokes
from ecapture import ecapture as ec
import pywhatkit as kt
import subprocess
import smtplib
import requests
```

```
/Users/sapnasingh/PycharmProjects/pyvoiceassistant/venv/bin/python /Users
Loding your AI personal assistant Jarvis
Hello,Good Morning
Say something...!
result2:
{   'alternative': [   {   'confidence': 0.88687539,
                           'transcript': 'search inheritance'}],
    'final': True}
I heard you say search inheritance
```

About 83,80,00,000 results (0.38 seconds)

Inheritance is **a feature or a process in which, new classes are created from the existing classes**. The new class created is called "derived class" or "child class" and the existing class is known as the "base class" or "parent class". The derived class now is said to be inherited from the base class. 19-Sept-2022

https://www.geeksforgeeks.org › inheritance-in-c

Inheritance in C++ - GeeksforGeeks

People also ask

What is inheritance explain?

What are the 4 types of inheritance?

What is inheritance in programming?

What is the inheritance in Java?

https://www.javatpoint.com › inheritance-in-java

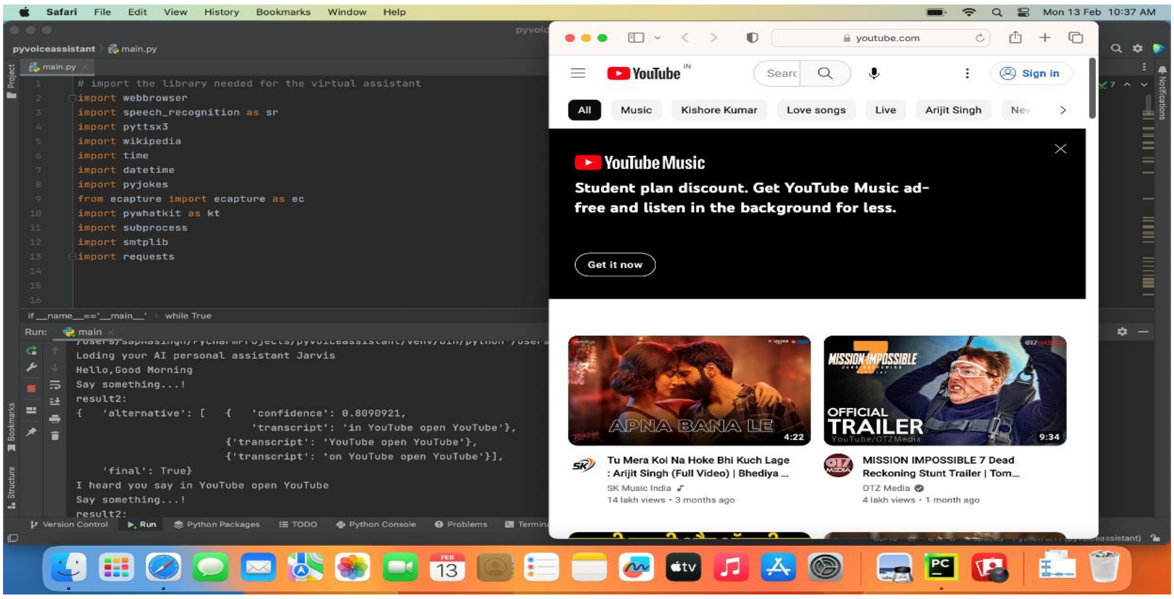
Inheritance in Java - Javatpoint

Listening

Say something..!

The command is printed =open Youtube

Open Youtube app Listening and Recognizing



```
# import the library needed for the virtual assistant
import webbrowser
import speech_recognition as sr
import pyttsx3
import wikipedia
import time
import datetime
import pyjokes
from ecapture import ecapture as ec
import pywhatkit as kt
import subprocess
import smtplib
import requests
```

```
Loding your AI personal assistant Jarvis
Hello,Good Morning
Say something...!
result2:
{   'alternative': [   {   'confidence': 0.8090921,
                           'transcript': 'in YouTube open YouTube'},
                       {'transcript': 'YouTube open YouTube'},
                       {'transcript': 'on YouTube open YouTube'}],
    'final': True}
I heard you say in YouTube open YouTube
Say something...!
result2:
```

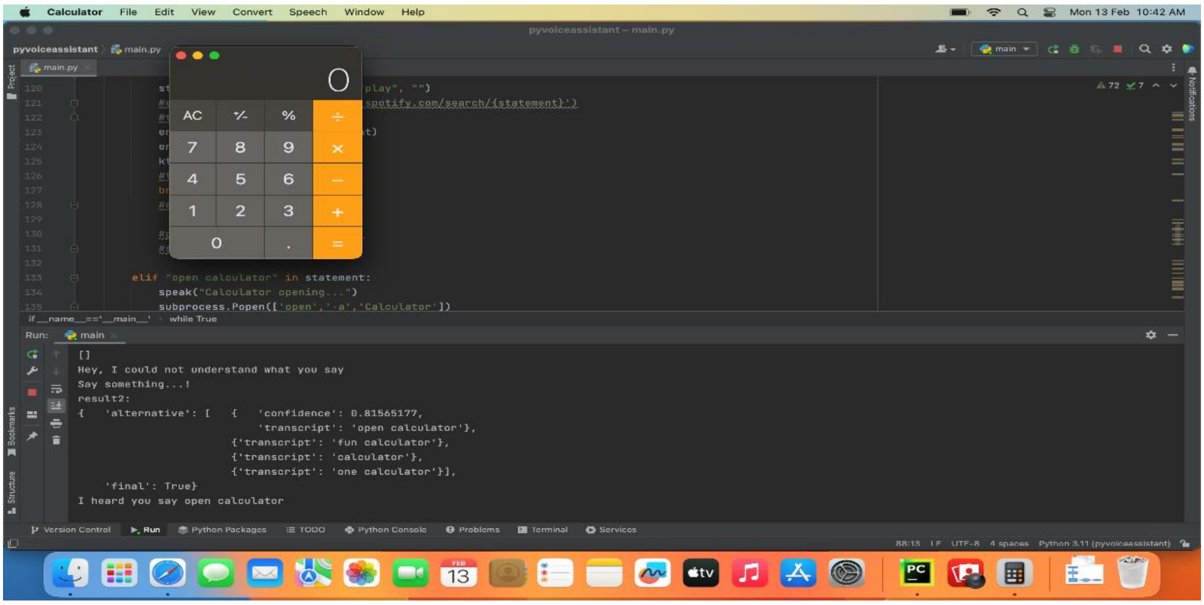
YouTube Music
Student plan discount. Get YouTube Music ad-free and listen in the background for less.
Get it now
Tu Mera Koi Na Hoke Bhi Kuch Lage : Arijit Singh (Full Video) | Bhediya ...
MISSION IMPOSSIBLE 7 Dead Reckoning Stunt Trailer | Tom...

Listening

Say something..!

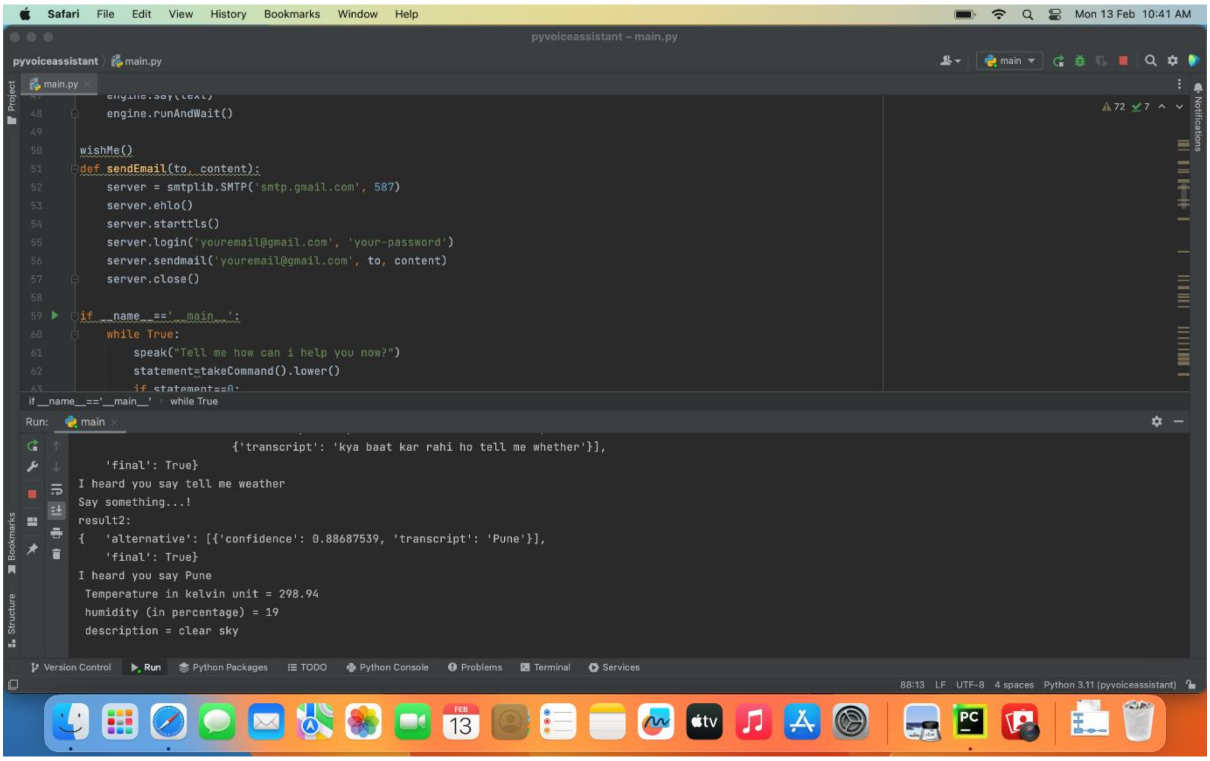
The command is printed =open Calculator

Open calculator app Listening and Recognizing



```
        elif "open calculator" in statement:
            speak("Calculator opening...")
            subprocess.Popen(['open','-a','Calculator'])
```

```
[]
Hey, I could not understand what you say
Say something...!
result2:
{   'alternative': [   {   'confidence': 0.81565177,
                           'transcript': 'open calculator'},
                       {'transcript': 'fun calculator'},
                       {'transcript': 'calculator'},
                       {'transcript': 'one calculator'}],
    'final': True}
I heard you say open calculator
```



Safari File Edit View History Bookmarks Window Help
Mon 13 Feb 10:41 AM
pyvoiceassistant – main.py
pyvoiceassistant 〉 main.py
main.py
Project
Bookmarks
Structure
Notifications
if __name__=='__main__' 〉 while True
Run: main
Version Control
Run
Python Packages
TODO
Python Console
Problems
Terminal
Services
88:13 LF UTF-8 4 spaces Python 3.11 (pyvoiceassistant)

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

wishMe()
def sendEmail(to, content):
    server = smtplib.SMTP('smtp.gmail.com', 587)
    server.ehlo()
    server.starttls()
    server.login('youremail@gmail.com', 'your-password')
    server.sendmail('youremail@gmail.com', to, content)
    server.close()

if __name__=='__main__':
    while True:
        speak("Tell me how can i help you now?")
        statement=takeCommand().lower()
        if statement==0:
```

```
                          {'transcript': 'kya baat kar rahi ho tell me whether'}],
    'final': True}
I heard you say tell me weather
Say something...!
result2:
{   'alternative': [{'confidence': 0.88687539, 'transcript': 'Pune'}],
    'final': True}
I heard you say Pune
 Temperature in kelvin unit = 298.94
 humidity (in percentage) = 19
 description = clear sky
```

5. DRAWBACKS AND LIMITATION

- It need a internet connection
- Security is somewhere an issue, there is no voice command encryption in this project.
- Background voice can interfere.
- Misinterpretation because of accents and may cause inaccurate results.
- JARVIS cannot be called externally anytime like other traditional assistants like Google Assistant can be called just by saying, “Ok Google!”
- Internet Connection
- High data use
- Hindi language is not supported
- Voice recognition isn't perfect
- Language Barrier
- Security and privacy
- Make humans lazy
- No creativity

6. CONCLUSION

In this paper we have discussed about Personal Virtual Assistant For Mac os Using Python. Virtual assistant makes life easier to humans. virtual assistant is the flexibility to contract for just the services they need. We use Artificial Intelligence technology for this project. Virtual Personal Assistants are effective way to manage or organize your schedule. Virtual Personal assistants are also reliable than Human Personal Assistant because, virtual personal Assistants are more portable, loyal and available to use anytime. Our virtual assistant will be intimate you with suggestions and taking instructions, and will know more about you. We can expect this device to be permanent.

Features

- Greet user
- Search anything on google
- Tell a random joke
- Open Youtube
- Can play any song on Youtube
- Open mail
- Open current news
- Tell Current Date And Time

- Launch Windows Application
- Send Email
- Tell about weather of any city
- Tell about any person(via Wikipedia)
- Easy to use
- Question related to mca admission in Dy Patil School of MCA

7. REFERENCES

Reference Book:

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THANK YOU