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ABSTRACT

The goal of this project is to create a computer program that can act as a personal assistant for people. There are many people working on this intriguing idea all across the world. The two things that people nowadays are most sensitive to are time and security. No one has time to waste, and no one wants their security to be compromised. The automation of many processes as a result of this lack of time and patience gave rise to phone assistants, one of which, but there is a much less explored area of PC assistants. There are very few options available globally for pc assistants, and the market is dominated by assistants of popular OSs, which has slowed the development of pc assistants. In India, where the majority of these aides are unsupported, the situation is far worse. As engineering students, this profoundly affected us since we believed that our nation should also have a desktop assistant that supports and makes people's lives easier.

We are aware that throughout the last ten years, research on AI systems has significantly increased. People all across the world are introducing new AI prototypes and models every day. This project gets underway by following the same pattern. Due to the installation of a variety of features across multiple categories, this project is unique. These systems, as we have seen, are devoted to a particular purpose, but they also perform other activities.

Below are some tasks on which this system shall function:

- Chat-bot
- Home appliances controller
- Providing answers to user about his/her queries from search engine over the internet
- Personal assistant

Additional features could also be installed during later updates.

Software Requirement Specification Document

1. Introduction

In this day and age, time and security are the two main things to which people are the most sensitive towards, since no one has the time to waste; This is mainly focused towards those people who lack time and patience which has given birth to the automation of several processes, phone assistants are also a result of this, but there is a niche and unexplored space of PC based voice assistants globally with very few options available in the market which is dominated by the integrated voice assistants of the established operating systems which have not been developed properly after their release, this has stagnated the development of pc assistants.

1.1 Purpose

The purpose of this project is to develop a working software that will be able to serve humans as their personal assistant. This is an interesting concept which we are trying to dive in and explore.

1.2 Intended Audience and Reading Suggestions

This is intended to serve those people who do not have time or do not want to waste their time doing monotonous tasks which can be performed by voice assistants.

1.4 Project Scope

The intended scope of this project is to cater to the audience looking for any of the following functions

- Chat-bot
- Home appliances controller
- Providing answers to user about his/her queries from search engine over the internet
- Personal assistant Above are the main features on which this system will function.

1.5 References

Wikipedia

Class notes

Software engineering by Ian Sommerville.

2. Overall Description

2.1 Product Perspective

The software will be able to perform the task which is prompted by the user for example after saving the voice command and converting the voice command into text it should be able to redirect it to the intended website like a search engine in case of a query or youtube in case the prompt is to play music.

2.2 Product Features

The software will include features like •
Choose what the voice assistant will address you as.

- Weather and time when prompted for.
- Information Search through Wikipedia when prompted for
- Fact searches when prompted for
- Playing songs on YouTube when prompted for
- Jokes when prompted for.

2.3 /2.4 User Classes and Characteristics, User Documentation

The requirement is for the software to act upon by searching for the keywords that are being used by the user like play or search.

Along with performing the intended task it should be able take feedback from the user which should then be forwarded in documented form to the developer so that the voice assistant can constantly be updated and improved according to user's needs.

2.5 Operating Environment

This software will be available in all the established operating systems that is

WINDOWS
MAC OS
LINUX

2.6 Design and Implementation Constraints

The biggest hurdle faced by our project is that of language barrier it understands only English and only certain accents.

2.7 Assumptions and Dependencies Assumptions:

The user should have basic technical literacy.

Dependencies:

- . A Desktop PC with a working microphone and speakers along with a decent internet connection.

3. System Features

3.1 System Feature

- Choose what the voice assistant will address you as.
- Weather and time when prompted for.
- Information Search through Wikipedia when prompted for
- Fact searches when prompted for
- Playing songs on YouTube when prompted for Jokes when prompted for

4. External Interface Requirements

4.1 User Interfaces

An exe file so that the user can prompt the assistant as per the user's requirement.

4.2 Hardware Interfaces

Windows OS

A working pair of microphone and a speaker connected to the desktop.

4.3 Software Interfaces

Windows – We have chosen windows due to its user friendliness and support

Python – We have chosen python due our familiarity of the language and the multiple libraries that are available to be imported.

5. Other Non-functional Requirements

5.1 Performance Requirements

The software should be able to identify the user's voice even from far distance and give the appropriate output.

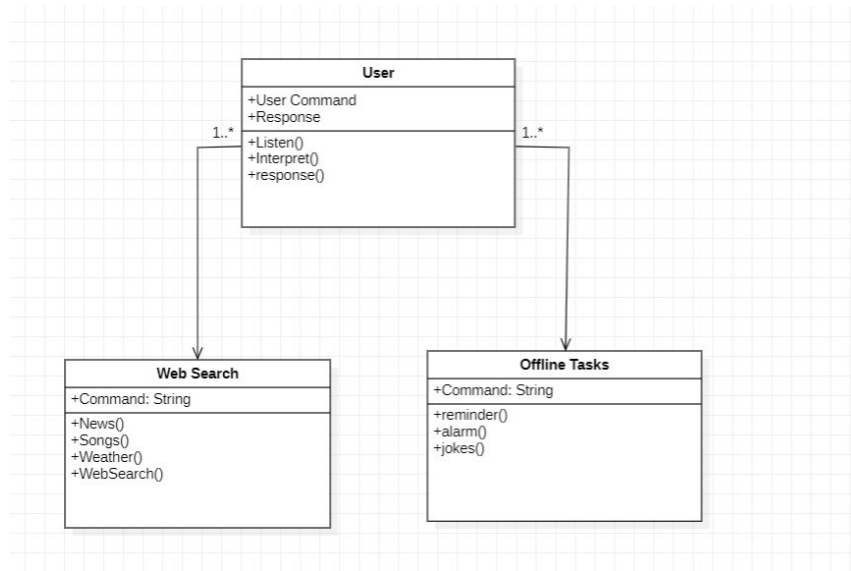
5.2 /5.3 Safety Requirements & Security Requirements:

- User should be able to turn of microphone access
- User should be able to delete the history of commands when required.
- The voice command should activate only with the voices registered by the user.

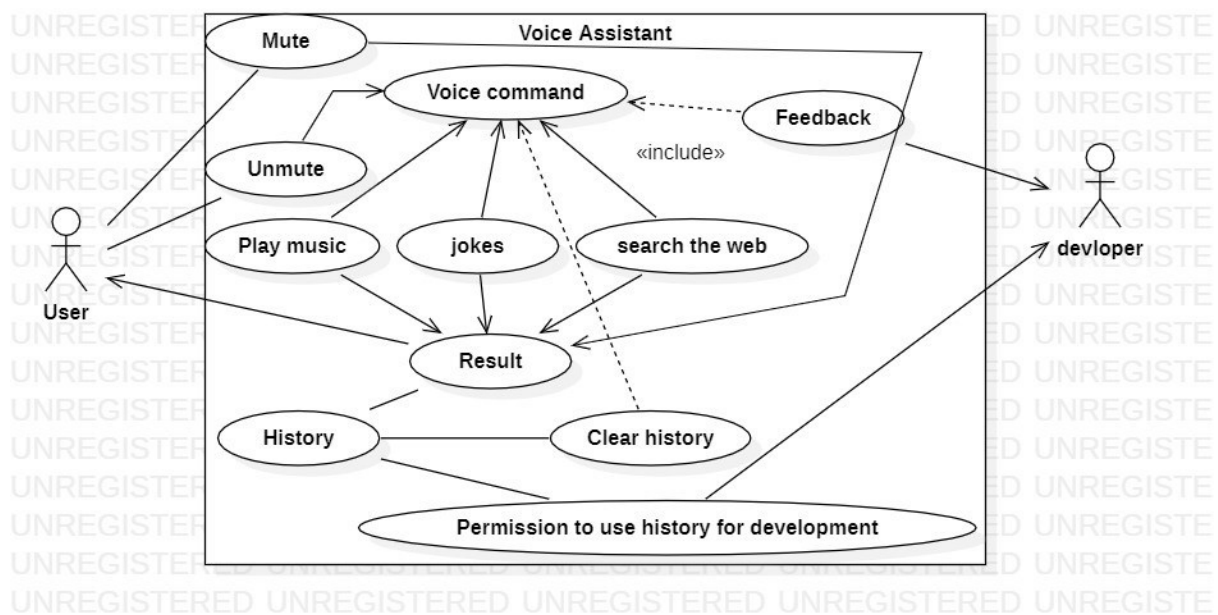
5.4 Software Quality Attributes:

- CORRECTNESS:
 - The system should provide accurate results when prompted or close to appropriate result if the actual result is unavailable.
- MAINTABILITY:
 - It should be easy for the developers to remove bugs and add additional features

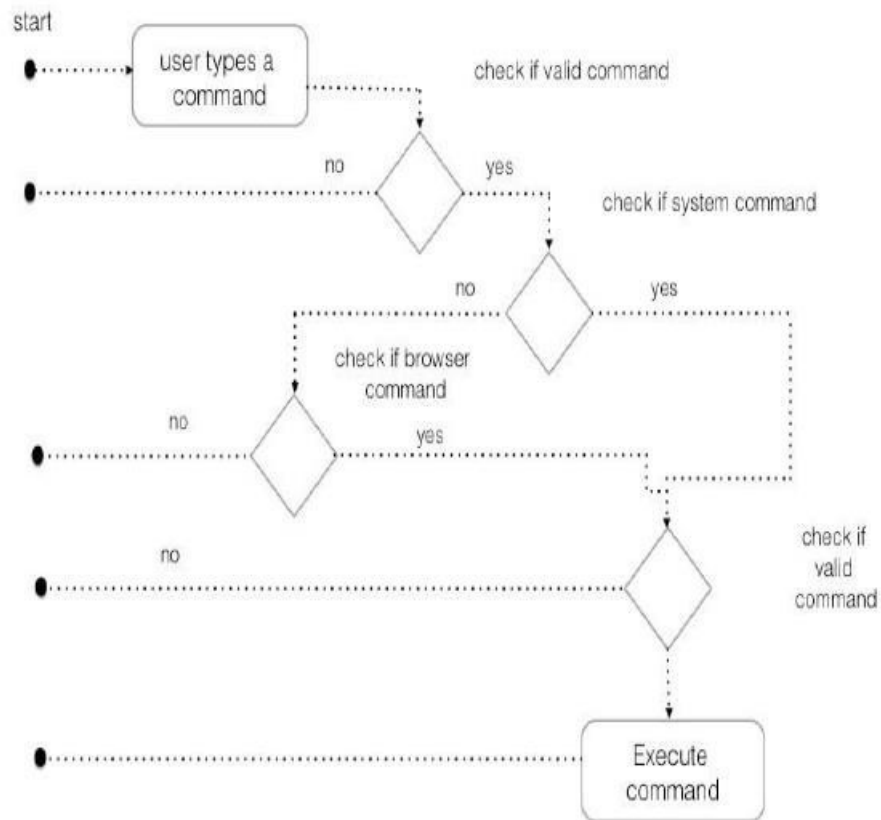
Class Diagram:



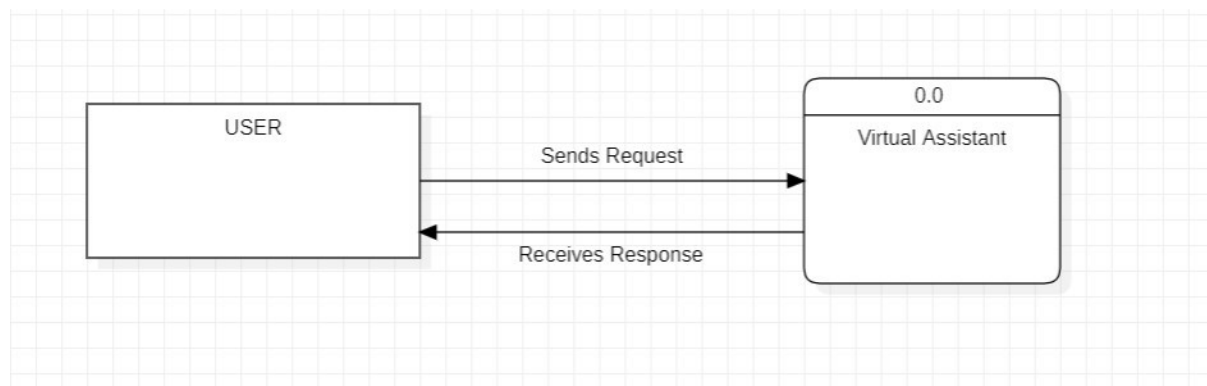
Use case Diagram:

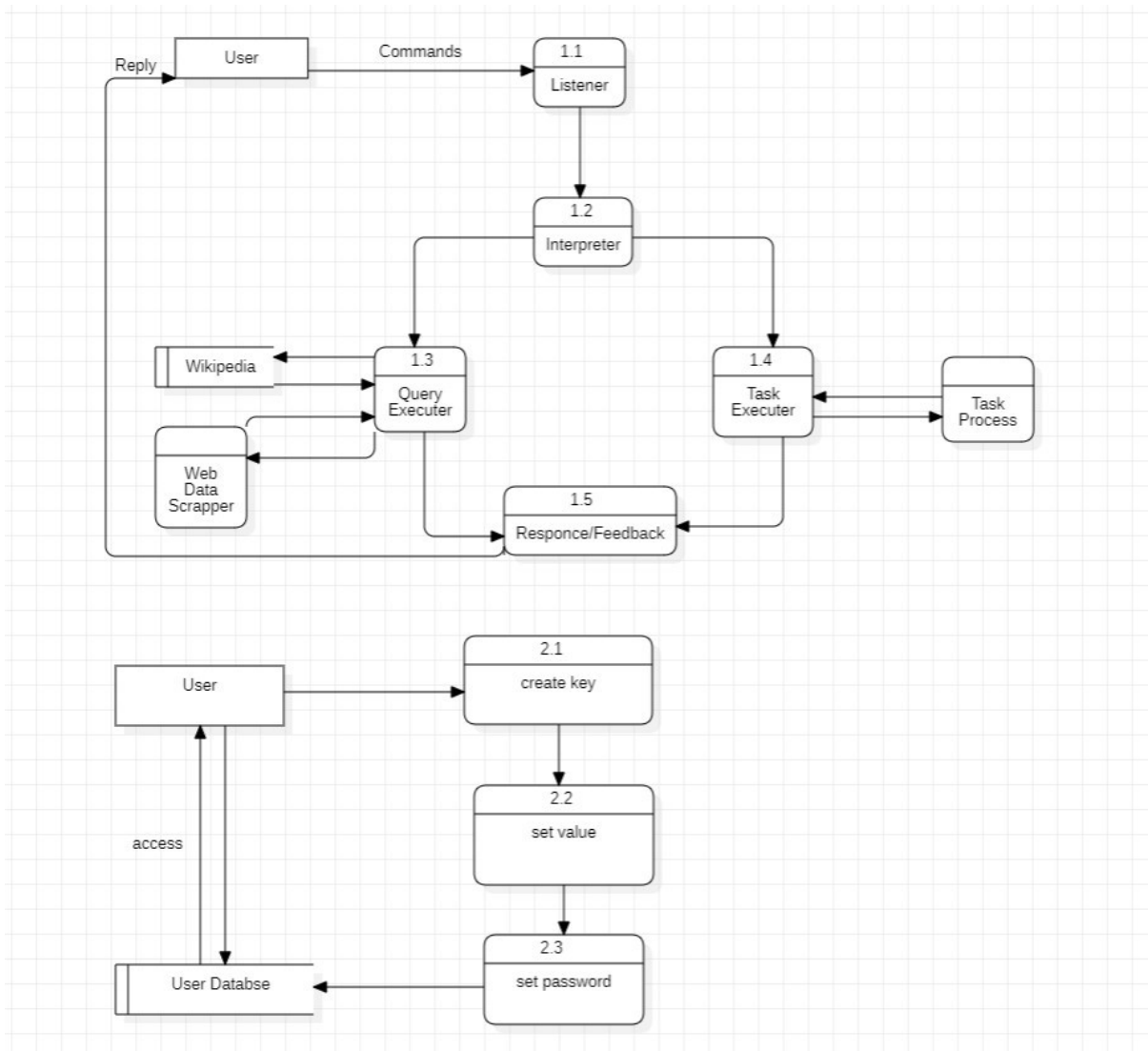


Activity Diagram:

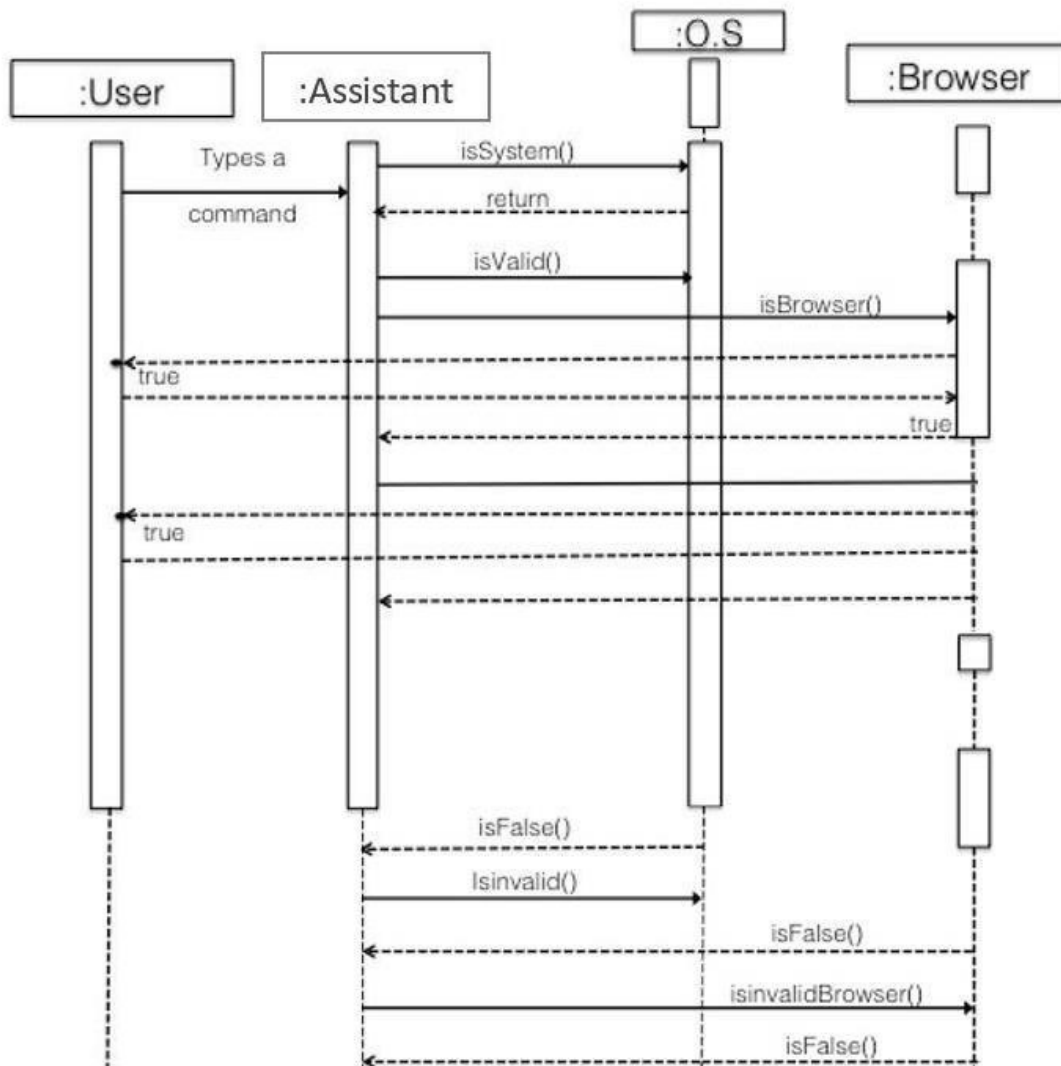


DFD





Sequential Diagram:



REVIEW 4: Software Implementation CODE:

Main:

```
import pytsx3 as p
import speech_recognition as sr
    from selenium_web import
* from YT_auto import *
from News import * from
jokes import * from
weather import * import
randfacts import datetime

engine = p.init()
rate=engine.getProperty('rate')
engine.setProperty('rate',190 )
voices=engine.getProperty('voices')
engine.setProperty('voice',voices[1].id) def
speak(text):
    engine.say(text)
engine.runAndWait()
    print("Hi. I am your virtual assistant.
") speak("Hi. I am your virtual assistant.
") today_date=datetime.datetime.now()
    print("Today is " + today_date.strftime("%d") + " of " + today_date.strftime("%B") +
", and its currently " + (today_date.strftime("%I")) + (today_date.strftime("%M")) +
(today_date.strftime("%p")))
speak("Today is " + today_date.strftime("%d") + " of " + today_date.strftime("%B") + ",
and its currently " + (today_date.strftime("%I")) + (today_date.strftime("%M")) +
(today_date.strftime("%p")))
print("The temperature in Vellore is " + str(temp()) + " degree celsius and with " +
str(des()) + ". How are you doing today?")
speak("The temperature in Vellore is " + str(temp()) + " degree celsius and with " +
str(des()) + ". How are you doing today?")

    r =
sr.Recognizer() def
microphone():
    with sr.Microphone() as source:
        r.energy_threshold = 10000
        r.adjust_for_ambient_noise(source,1)
print("listening...")        audio =
r.listen(source)        text =
r.recognize_google(audio)        return
text
    text1 =
microphone()
print(text1)
```

```

if "what" and "about" and "you" in text1:
    print("I am also having a good day sir.")
    speak("I am also having a good day sir.")
    print("What can I do for you?") speak("What
    can I do for you?")

text2 = microphone() print(text2)
if "play" and "song" in
text2:
    print("Sure. Which song do you want me to play?")
    speak("Sure. Which song do you want me to play?")
    vid = microphone() print(vid)
    print("Playing {} on youtube".format(vid))
    speak("Playing {} on youtube".format(vid))
    assist = music() assist.play(vid)
elif "information" in
text2:
    print("Sure. You need information related to which topic?")
    speak("Sure. You need information related to which topic?")
    info = microphone() print(info)
    print("Searching {} in wikipedia".format(info))
    speak("Searching {} in wikipedia".format(info))
    assist = infow() assist.get_info(info)
elif "news" in
text2:
    print("Sure. Now I will read the news for you.")
    speak("Sure. Now I will read the news for you.")
    arr=news() for i in range(len(arr)):
        print(arr[i])
    speak(arr[i])
elif "fact" in text2:
    speak("Sure sir.") x =
    randfacts.get_fact()
    print(x)
    speak("Did you know that, "+x)
elif "joke" in text2:
    arr = joke()
    speak("Sure. Get ready for some chuckles.")
    print(arr[0]) speak(arr[0])
    print(arr[1]) speak(arr[1])

else:
    print("Sorry. I am not programmed to do that yet.")
    speak("Sorry. I am not programmed to do that yet.")

```

Module to play a song:

YT_auto

```
from selenium import webdriver
class music():
def __init__(self):
    self.driver = webdriver.Chrome(executable_path='C:\Drivers\chromedriver.exe')
    def play(self,
query):
self.query = query
    self.driver.get(url="https://www.youtube.com/results?search_query=" +
query)
    while(True):
        continue
```

Module to search information:

Selenium_web

```
from selenium import webdriver

import pyttsx3 as px

engine = px.init()
engine.setProperty('rate',190)
def speak(text):
    engine.say(text)
    engine.runAndWait()
class infow():
def __init__(self):
    self.driver = webdriver.Chrome(executable_path='C:\Drivers\chromedriver.exe')
    def
get_info(self,query):
self.query = query

self.driver.get(url="https://en.wikipedia.org/wiki/"+query)
while(True):
    continue
```

News:

```
import requests
from S_API import *
#S_API is another package which contains the following variable 'key'.
#The variable 'key' stores the API of the user and can't be shared due to
security reasons
api_address="https://newsapi.org/v2/top-headlines?country=us&apiKey="+key
```

```

json_data = requests.get(api_address).json()
ar=[]
def news():
for i in range(3):
    ar.append("Number "+ str(i+1) + ": " + json_data["articles"][i]["title"]+".")

return ar

```

TEST CASES:

Module to play a song:

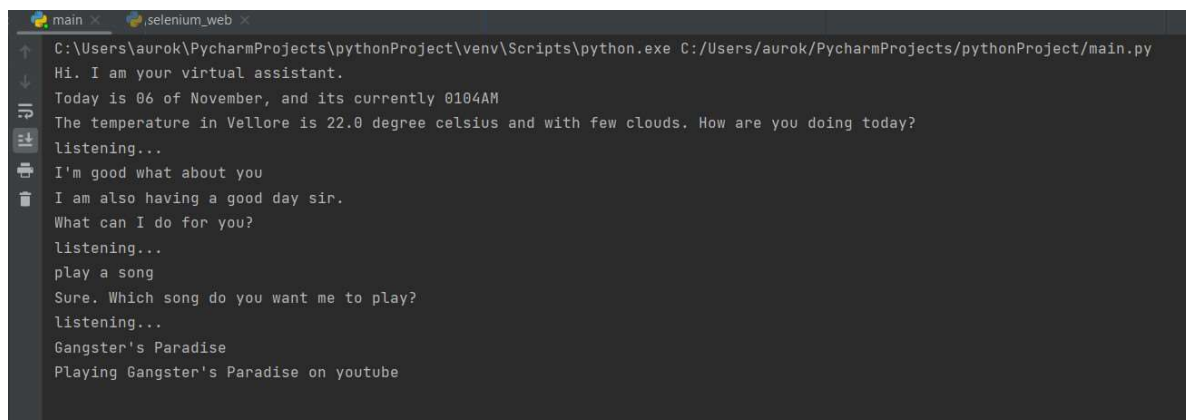
YT_auto

```

from selenium import webdriver
class music():
def __init__(self):
    self.driver = webdriver.Chrome(executable_path='C:\Drivers\chromedriver.exe')
    def play(self,
query):
self.query = query
    self.driver.get(url="https://www.youtube.com/results?search_query=" +
query)
    while(True):
        continue

```

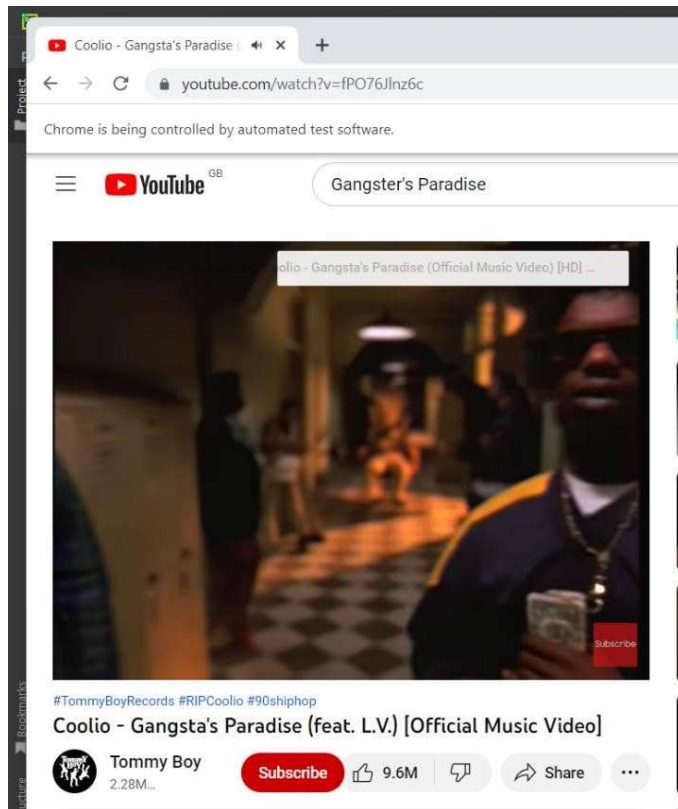
Output:



```

main x selenium_web x
C:\Users\aurok\PycharmProjects\pythonProject\venv\Scripts\python.exe C:/Users/aurok/PycharmProjects/pythonProject/main.py
Hi. I am your virtual assistant.
Today is 06 of November, and its currently 0104AM
The temperature in Vellore is 22.0 degree celsius and with few clouds. How are you doing today?
listening...
I'm good what about you
I am also having a good day sir.
What can I do for you?
listening...
play a song
Sure. Which song do you want me to play?
listening...
Gangster's Paradise
Playing Gangster's Paradise on youtube

```



Module to get information:

Selenium_web

```
from selenium import webdriver
import pyttsx3 as
px

engine = px.init()
engine.setProperty('rate',190)
def speak(text):
    engine.say(text)
engine.runAndWait()
class
infow():
    def __init__(self):
        self.driver = webdriver.Chrome(executable_path='C:\Drivers\chromedriver.exe')
    def
get_info(self,query):
    self.query = query

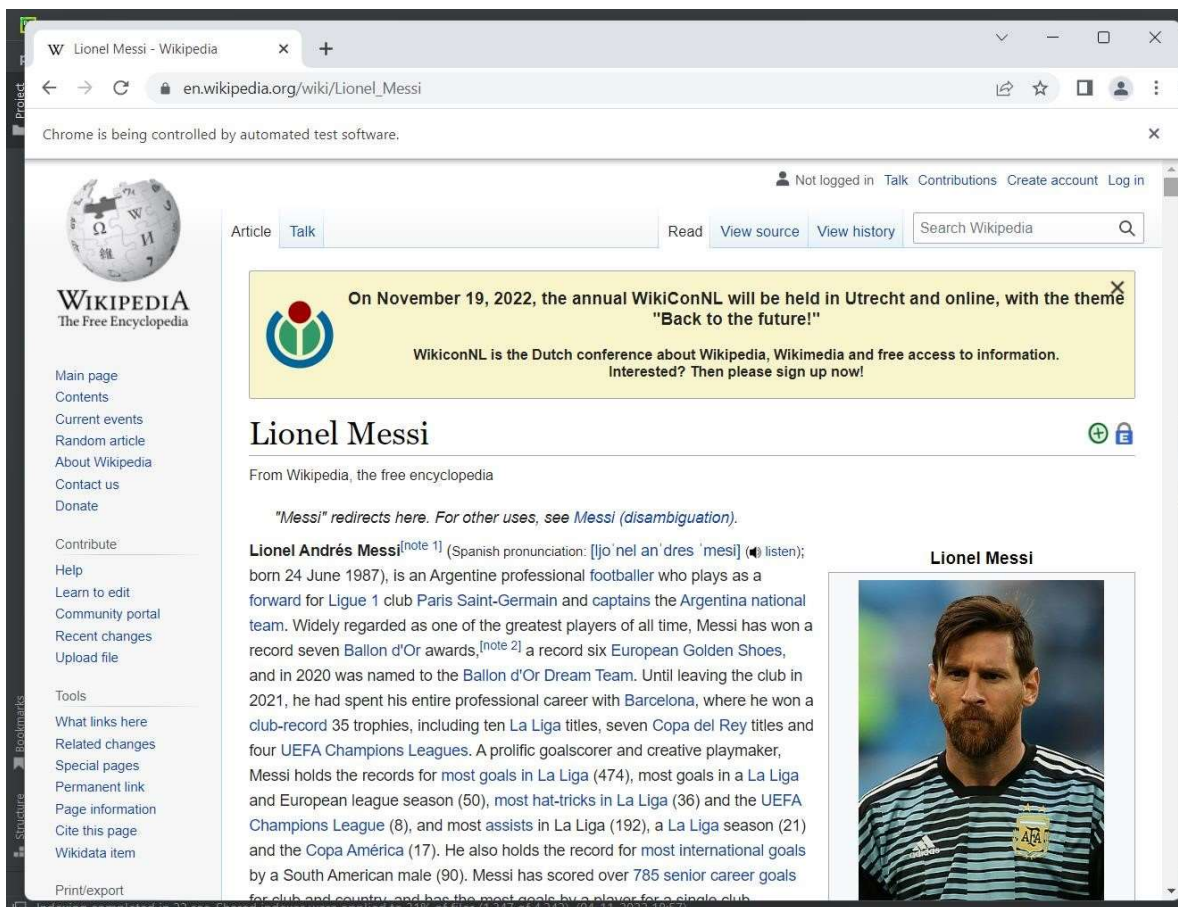
self.driver.get(url="https://en.wikipedia.org/wiki/"+query)
while(True):
    continue
```

Output:

```
main x selenium_web x
C:\Users\aurok\PycharmProjects\pythonProject\venv\Scripts\python.exe C:/Users/aurok/PycharmProjects/pythonProject/main.py
Hi. I am your virtual assistant.
Today is 06 of November, and its currently 0109AM
The temperature in Vellore is 22.0 degree celsius and with few clouds. How are you doing today?
listening...
I'm good what about you
I am also having a good day sir.
What can I do for you?
listening...
get me information please
Sure. You need information related to which topic?
listening...
Lionel Messi
Searching Lionel Messi in wikipedia
```

Version Control Run Python Packages TODO Python Console Problems Terminal Services

Indexing completed in 22 sec. Shared indexes were applied to 31% of files (1,347 of 4,242). (04-11-2022 18:57) 20:21 (46)



News:

```
import requests
from S_API import *
#S_API is another package which contains the following variable 'key'.
#The variable 'key' stores the API of the user and can't be shared due to
security reasons
api_address="https://newsapi.org/v2/top-headlines?country=us&apiKey="+key
json_data = requests.get(api_address).json()
ar=[]
def news():
for i in range(3):
    ar.append("Number "+ str(i+1) + ": " + json_data["articles"][i]["title"]+".")

return ar
```

Output:

```
main x selenium_web x
Hi. I am your virtual assistant.
Today is 06 of November, and its currently 0516PM
The temperature in Vellore is 25.5 degree celsius and with overcast clouds. How are you doing today?
listening...
I am good what about you
I am also having a good day sir.
What can I do for you?
listening...
get me a breaking news please
Sure. Now I will read the news for you.
Number 1: College football rankings: Projecting AP Top 25 rankings entering Week 11 - 247Sports.
Number 2: Launch of SS Sally Ride Space Station Supply Mission NG-18 (Official NASA Broadcast) - NASA.
Number 3: Russia-Ukraine war latest updates - The Washington Post.

Process finished with exit code 0
```

Facts:

Output:

```
main x selenium_web x
C:\Users\aurok\PycharmProjects\pythonProject\venv\Scripts\python.exe C:/Users/aurok/PycharmProjects/pythonProject/main.py
Hi. I am your virtual assistant.
Today is 06 of November, and its currently 0526PM
The temperature in Vellore is 25.5 degree celsius and with overcast clouds. How are you doing today?
listening...
I am good what about you
I am also having a good day sir.
What can I do for you?
listening...
get me a fact
There is a tree called the Idiot Fruit, it grows in Australia's Daintree rainforest

Process finished with exit code 0
```

Jokes:

Output:

```
main x selenium_web x
C:\Users\aurak\PycharmProjects\pythonProject\venv\Scripts\python.exe C:/Users/aurak/PycharmProjects/pythonProject/main.py
Hi. I am your virtual assistant.
Today is 06 of November, and its currently 0533PM
The temperature in Vellore is 25.5 degree celsius and with overcast clouds. How are you doing today?
listening...
I am going good what about you
I am also having a good day sir.
What can I do for you?
listening...
crack a joke
A SQL query walks into a bar, walks up to two tables and asks...
'Can I join you?'
Process finished with exit code 0
```

Invalid Input:

```
main x selenium_web x
C:\Users\aurak\PycharmProjects\pythonProject\venv\Scripts\python.exe C:/Users/aurak/PycharmProjects/pythonProject/main.py
Hi. I am your virtual assistant.
Today is 06 of November, and its currently 0542PM
The temperature in Vellore is 25.5 degree celsius and with overcast clouds. How are you doing today?
listening...
I am doing good what about you
I am also having a good day sir.
What can I do for you?
listening...
call Ishan
Sorry. I am not programmed to do that yet.
Process finished with exit code 0
```

Test case:

Serial Number	INPUT	OUTPUT
1)	Play a song	Plays the song from youtube (VALID)
2)	Get me information	Opens the Wikipedia page related to the requested topic (VALID)
3)	Tell me a joke	Will read out a random joke (VALID)
4)	Get me a fact	Will read out random facts (VALID)
5)	Today's news	Will read out the top 3 headlines of that day (VALID)
6)	Make a phone call	will respond by saying I'm not programmed to do that yet (INVALID)

RESULT AND DISCUSSION

We can see that the application passed all the testcases and gave the expected outputs for each. The application helps ease the PC users' working and enhances their desktop experience. Although the current features of the project these are some of the most essential features for an AI assistant specially on desktop, with time as more features need to be added to the project to further improve the users' experience, it is also essential to identify and work on the issues faced by users by taking proper feedbacks from time to time. Overall due to the scarcity of such assistants in desktops specially so in India, this application has a very high potential and can reach great heights over time

CONCLUSION

Through this voice assistant, we have automated various services using a single line command. It eases most of the tasks of the user like searching the web, retrieving weather forecast details, vocabulary help and medical related queries. We aim to make this project a complete server assistant and make it smart enough to act as a replacement for a general server administration. The future plans include integrating the assistant with mobile using React Native to provide a synchronized experience between the two connected devices. Further, in the long run, the assistant is planned to feature auto deployment supporting elastic beanstalk, backup files, and all operations which a general Server Administrator does. The functionality would be seamless enough to replace the Server Administrator with the assistant

FUTURE SCOPE

The most immediate work for us is to increase the number of languages one can interact with the assistant in and also train the language for even higher number of different English accents, we also plan to set up features such as opening 3rd party applications, setting reminders and making emails. We feel compelled to keep working on adding more and more features to this document due to the fact that we feel that it's high time India got it's own desktop assistant and which is globally recognizable.

REFERENCES

1. https://en.wikipedia.org/wiki/Internet_Information_Services
2. https://en.wikipedia.org/wiki/Raspberry_Pi
3. <https://en.wikipedia.org/wiki/ESP8266>
4. <https://en.wikipedia.org/wiki/Arduino>
5. https://en.wikipedia.org/wiki/Microsoft_Speech_API
6. <http://whatis.techtarget.com/definition/sensor>
7. www.azosensors.com/article.aspx?ArticleID=339
8. http://wiki.seeed.cc/Grove-Sound_Sensor/
9. https://www.vexrobotics.com/wiki/Ultrasonic_Range_Finder
10. <https://www.adafruit.com/product/386>
11. <http://www.futureelectronics.com/en/drivers/motordriver.aspx>