

# **VOICE RECOGNITION MODEL**



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Report submitted in partial fulfillment of the requirements for the degree of



**Bachelor of Technology**

**In**

**Computer Science and Engineering**

**Under the Supervision of**

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# TABLE OF CONTENTS

CANDIDATES DECLARATION.....	5
CERTIFICATE.....	6
ACKNOWLEDGEMENT.....	7
ABSTRACT.....	8
LIST OF FIGURES.....	9
LIST OF ABBREVIATIONS.....	10
CHAPTER 1: INTRODUCTION TO VOICE RECOGNITION .....	11-16
1.1 ABOUT VOICE ASSISTANT	
i. PURPOSE	
ii. SCOPE	
1.2BASIC PRINCIPLES USED	
iii. NATURAL LANGUAGE PROCSSING	
iv. AUTOMATIC SPEECH RECOGNITION	
v. ARTIFICIAL INTELLIGENCE	
vi. INTER PROCESS COMMUNICATION	
CHAPTER 2: CONCEPTUAL FRAMEWORK.....	17-20
2.1 FUNCTIONS.	
2.2 SYSTEM IMPLEMENTATION.	
2.2.1 SYSTEM SPECIFICATION	
CHAPTER 3:PROCESS INVOLVED IN CREATING VPA.....	21-29
3.1 WORKING OF THREE-LAYER	
3.2UML AND USE CASE DIAGRAM	
3.3ACTIVITY DIAGRAM	
3.4 DATA FLOW DIAGRAM	
CHAPTER 4:LANGUAGES AND IDE REQUIRED FOR DEVELOPMENT.....	30-40
4.1 PYTHON	
4.2 USED IDE	
4.3 POSTGRESQL	
4.4 USED PYTHON LIBRARIES	

#### 4.5 PROJECT CODES

CHAPTER 5:INPUT/OUTPUT .....	<b>41-50</b>
TESTING.....	<b>51</b>
POST IMPLEMENTATION REVIEW.....	<b>52</b>
FUTURE ENHANCEMENT.....	<b>53-54</b>
CONCLUSION.....	<b>55</b>
REFERENCES.....	<b>56</b>

## **CANDIDATES DECLARATION**

*We hereby declare that this submission is our own work and that, to the best of our knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.*

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# CERTIFICATE

*This is to certify that Project Report entitled “**VOICE RECOGNITION MODEL**” which is submitted by **Mohit Kumar Gupta(1680210022)**, **Satyendr Pal Singh(1680210031)**, **Vicky Maddheshiya(1680210040)** and **Govind Nair(1680210456)** in partial fulfillment of the requirement for the award of degree Bachelor Of Engineering in Computer Science & Engineering, **NITRA Technical Campus**, Ghaziabad, of **Dr.A.P.J.Abdul Kalam Technical University** is a record of the candidate own work carried out by him under my/our supervision.*

*The matter embodied in this thesis is original and has not been submitted for the award of any other degree.*

**Date:**

**Mr. Nitin Kumar Sharma**  
**(Supervisor)**

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*We also do not like to miss the opportunity to acknowledge the contribution of all faculty members of the department for their kind assistance and cooperation during the development of our project. Last but not the least, we acknowledge our friends for their contribution in the completion of the project.*

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# ABSTRACT

*Abstract of this report discusses ways in which new technology could be harnessed to create an intelligent Voice Recognition Model (VRM) with a focus on user-based information. It will look at examples of intelligent programs with natural language processing that are currently available, with different categories of support, and examine the potential usefulness of one specific piece of software as a VPA.*

*This engages the ability to communicate socially through natural language processing, holding (and analyzing) information within the context of the user. It is suggested that new technologies may soon make the idea of virtual personal assistants a reality.*

*Experiments conducted on this system, combined with user testing, have provided evidence that a basic program with natural language processing algorithms in the form of a VPA, with basic natural language processing and the ability to function without the need for other type of human input (or programming) may already be viable.*



## **LIST OF FIGURES**

<b>S.No.</b>	<b>Figure Name</b>	<b>Page No.</b>
<b>1</b>	UML Diagram	23
<b>2</b>	Use Case Diagram	24
<b>3</b>	State Sequence Diagram	25
<b>4</b>	Collaboration Diagram	26
<b>5</b>	Activity Diagram	26
<b>6</b>	Date Flow Diagram	27

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## **LIST OF ABBREVIATIONS**

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<b>Abbreviation</b>	<b>Full Form</b>
<b>NLP</b>	Natural Language Processing
<b>AI</b>	Artificial Intelligence
<b>IPC</b>	Inter Process Communication
<b>SQL</b>	Structured Query Language
<b>UML</b>	Unified Modeling Language
<b>E-R Diagram</b>	Entity-Relationship Diagram
<b>W3W</b>	World Wide Web

# **CHAPTER-1**

# **INTRODUCTION**

## **1.1 About Voice Assistant.**

An **intelligent virtual assistant (IVA)** or **intelligent personal assistant (IPA)** is a software agent that can perform tasks or services for an individual based on commands or questions. Sometimes the term "Chabot" is used to refer to virtual assistants generally or specifically accessed by online chat. In some cases, online chat programs are exclusively for entertainment purposes. Some virtual assistants are able to interpret human speech and respond via synthesized voices. Users can ask their assistants questions, control home automation devices and media playback via voice, and manage other basic tasks such as email, to-do lists, and calendars with verbal (spoken?) commands. A similar concept, however with differences, lays under the dialogue systems.[3]

Nowadays the Mobile Technology is being very famous for the User Experience, because it is very easy to access the applications and services from anywhere of your Geo-location. Android, Apple, Windows, Blackberry, etc. are various famous and commonly used Mobile Operating Systems. All the Operating Systems provides plenty of applications and services for users.

For an instance, the Contacts Applications is used to store the contact details of the user's contact and also helps user to connect a call or send an SMS to other person using the contents stored in this application. We can get similar types of application all around the world via Apple Store, Play Store, etc. All this features gives birth to various kinds of sensors or functionalities to be implemented in the mobile devices.[4]

The Most famous application of iPhone is "SIRI" which helps the end user to communicate end user to mobile with voice and it also responds to the voice commands of the user. Same kind of application is also developed by the Google that is "Google Voice Search" which is used for in Android Phones. But this Application mostly works with Internet Connections. But our Proposed System has capability to work with and without Internet Connectivity.

It's named as Personal Assistant with Voice Recognition Intelligence, which takes the user input in form of voice or text and process it and returns the output in various forms like action to be performed or the search result is dictated to the end user.

### 1.1.1 PURPOSE

A **virtual assistant** provides various services to entrepreneurs or businesses from a remote location. From digital marketing tasks, scheduling appointments and managing events to **personal** errands. You can make a **virtual assistant** do almost anything.

Speech recognition has a long history with several waves of major innovations. Speech recognition for dictation, search, and voice commands has become a standard feature on smartphones and wearable devices.

Design of a compact large vocabulary speech recognition system that can run efficiently on mobile devices, accurately and with low latency. This is achieved by using a CTC-based LSTM acoustic model which predicts context-independent phones and is compressed to a tenth of its original size using a combination of SVD-based compression and quantization. Quantized deep neural networks (DNNs) and on-the-fly language model rescoring to achieve real-time performance on modern smartphones.

The ASR and Search components perform speech recognition and search tasks. In addition to ASR and Search, we also integrate a query parsing module between ASR and Search for a number of reasons. Set of techniques for improving the performance of automated voice search services intended for mobile users accessing these services over a range of portable devices. Voice search is implemented as a two stage search procedure where string candidates generated by an automatic speech recognition (ASR) system are re-scored in order to identify the best matching entry from a potentially very large application specific database. Study provides a good example of how additional domain specific knowledge sources can be used with a domain independent ASR system to facilitate voice access to online search indices.

As more data becomes available for a given speech recognition task, the natural way to improve recognition accuracy is to train larger acoustic models. There are a non-parametric empirical model that exploits abundant training data to directly learn pronunciation variation. Interpolating the empirical model with a parametric model yields the best performance, with a relative improvement of 5.2% in WER over the baseline. There are a number of ways in which this work could be extended. First, closer integration with acoustic model training is likely to yield sharper distributions and a tighter fit to the data. Second, estimating word-pronunciation co-occurrence counts in semi-supervised fashion (e.g. through word recognition instead of forced alignment) would broaden its applicability to a wide range of speech genres and tasks.[1]

### **1.1.2 SCOPE**

Virtual assistants are impacting how we get information and changing the way we engage in business. Virtual assistants are enabling the shift away from screens to a more human-centered approach of engaging with the web and retrieving information – using our voice. With the improved capabilities and speech recognition of virtual assistants, we are beginning to see them proliferate in our daily life beyond just playing the song we ask for.[3]

Virtual assistants are making a huge splash, predominantly in the consumer and social spaces, as people become reliant on them to perform tedious tasks quickly and efficiently. As of mid-2017, there were an estimated 1 billion users of virtual assistants worldwide and that number is rapidly increasing. In addition, Skills, the applications that extend the power of the virtual assistants, are being developed at a fast pace by third-parties--Amazon's Alexa already has over 50,000. Opportunities for new use cases across industries continue to reveal themselves as the virtual assistant user base grows and new Skills hit the market.

## **1.2 Basic Principles Used:**

The working of Virtual Assistant uses following principles:

### **1.2.1 Natural Language Processing**

Natural language processing (NLP) is a subfield of linguistics, computer science, information engineering, and artificial intelligence concerned with the interactions between computers and human (natural) languages, in particular how to program computers to process and analyze large amounts of natural language data.[1]

- 1) To Understand user's speech input
- 2) Natural language understanding
- 3) Natural language generation.

### **1.2.2 Automatic Speech Recognition**

Automatic Speech recognition is an interdisciplinary subfield of computer science and computational linguistics that develops methodologies and technologies that enable the recognition and translation of spoken language into text by computers. It is also known as automatic speech recognition (ASR), computer speech recognition or speech to text (STT). It incorporates knowledge and research in the computer science, linguistics and computer engineering fields.[3]

- 1) To understand command according to user's input.
- 2) Speech to text Redirects here
- 3) Recognizing the speaker.

### **1.2.3 Artificial Intelligence**

In computer science, artificial intelligence (AI), sometimes called machine intelligence, is intelligence demonstrated by machines, in contrast to the natural intelligence displayed by humans and animals. Leading AI textbooks define the field as the study of "intelligent agents": any device that perceives its environment and takes actions that maximize its chance of successfully achieving its goals. Colloquially, the term "artificial intelligence" is often used to describe machines (or computers) that mimic "cognitive" functions that humans associate with the human mind, such as "learning" and "problem solving".

- 1) A To learn things from user and to store all information bout behavior and relations of user
- 2) reasoning,
- 3) knowledge representation,
- 4) planning,
- 5) learning,
- 6) natural language processing, perception [1]

### **1.2.4 Inter Process Communication**

In computer science, inter-process communication or interprocess communication (IPC) refers specifically to the mechanisms an operating system provides to allow the processes to manage shared data. Typically, applications can use IPC, categorized as clients and servers, where the client requests data and the server responds to client requests.<sup>[1]</sup> Many applications are both clients and servers, as commonly seen in distributed computing.[1]

- 1) To get important information from other software applications
- 2) microkernels and nanokernels
- 3) synchronous or asynchronous



# **CHAPTER-2**

## 2.1 CONCEPTUAL FRAMEWORK:

There is always scope for improvement. So the application was built using M.V.C architecture, incremental process design. These design structures follow the modular approach which makes it easy to add in new features to the system. The system also implements the singleton pattern and the single responsibility principle which ensure the individual functioning of the modules.[1]

Humans have a wide range of needs and motivations. They play assume and play many different roles in lives and take all kinds of actions to live, survive, or thrive. Virtual or digital assistants have started to appear and can perform some simple tasks, with different degrees of success. But much is to be desired. Today's virtual or digital assistants or agents can main do some searching or help persons play some simple informational roles. Ideally, virtual or digital assistant, together with other AI agents, should provide meaningful assistance for the end users play roles in all aspects: informational, interpersonal, and decisional. Alone with other roles, we think that virtual or digital agents would be desirable to have the following functions or capabilities:[3]

- Searching
- Sensing
- Exploring
- Adapting
- Communicating
- Analyzing
- Solving
- Negotiating
- Deciding
- Learning
- Other actions

### **2.1.1 Functions:-**

The system provides all the below stated functions and further more can be included as per user requirement.

- Greetings.
- Normal Chat.
- Playing music from your playlist.
- Browsing on web.
- Weather Reports gathering.
- Clicking a Photo from your device camera.
- Various multimedia operations.
- Open any system applications.
- Mailing facility
- Open YouTube.

## 2.2 SYSTEM IMPLEMENTATION

System implementation involves creating or acquiring the various system components such as software, hardware, and database etc. The primary goal of system implementation is to develop a source code which is easy to read and to understand and clarify the sources code of a source project. The implementation should provide a well-defined set of software requirements. Source code is intensified using structural coding techniques by good coding style, appropriate supporting documents, good internal comments etc.

### SYSTEM SPECIFICATION:

#### HARDWARE REQUIREMENTS

- **Processor** - Intel Pentium D or above
- **RAM** - 4GB RAM (Minimum)
- **Memory** - 100GBHDD (Minimum)
- **Operating System** - Windows or Linux, Android

#### SOFTWARE REQUIREMENTS

- **Operating System** : Cross-platform
- **Programming Language** : Python
- **IDE** : Pycharm ,Visual studio Code
- **Browser Support** : IE, Firefox, chrome etc.
- **Media Support** : VLC ,Groove Music[1]

# **CHAPTER-3**

## Process Involved In Creating VPA

You know about Cortana, Siri and Google Assistant, right? Have you ever imagined that you can make your own virtual personal assistant and customize it as you want? Today, we'll be doing it here. We'll be building a personal assistant from scratch in python. Oh, Before getting into it, let me tell you that by no means it's an AI but just a powerful example of what AI can do, and how versatile and amazing python is. Also, you need to have some experience with python in order to get started with it.[1]

First, we need to import some important packages:-

- **SpeechRecognition** : Library for performing speech recognition, with support for several engines and APIs, online and offline.[5]
- **Pytsx3**: Pytsx is a good text to speech conversion library in python.
- **Wikipedia**: Wikipedia is a Python library that makes it easy to access and parse data from Wikipedia.
- **Wolframalpha** : Python Client built against the WolframAlpha v2.0 API.
- **PyAudio** : Python Bindings for PortAudio.

```
import os
import sys
import datetime
import pytsx3
import speech_recognition
import wikipedia
import wolframalpha
import webbrowser
import smtplib
import random
```

Make sure you have installed all these packages or else you might run into some errors.

## 3.1 Working Of Three-Layer :-

Any Virtual Assistant basically consists of three layers.

### 1. Speech to text:

- A Piece of software used that converts audio to text. It doesn't understand just anything you might say.[1]

### 2. Text Analysing :

- Converted text is just letters for computer.[3]
- A piece of software converts text to something that is understandable for computer.
- Computer understands the command, so Virtual Assistant like siri convert this text to computer command.
- VPAs maps the words to functions and parameters to create a command that computer can understand[1]

### 3. Interpret commands:

- In this layer, that mapped computer command, go to server through internet.[2]
- Simultaneously, your speech evaluated locally
- A local recogniser communicate with server to judge whether command will be best handle locally or not.[3]

Example:-

Play Music, Restaurant reservation, Movie Rating

# **VARIOUS DIAGRAMATIC REPRESENTATION OF DESIGN STEP**

Unified Modeling Language Diagrams:

- Use Case Diagram
- Activity Diagram
- Data Flow Diagram
- State Diagram

The **Unified Modeling Language™ (UML®)** is a standard visual modeling language intended to be used for:

- Modeling business and similar processes,
- Analysis, design, and implementation of software-based systems

UML is a common language for business analysts, software architects and developers used to describe, specify, design, and document existing or new business processes, structure and behavior of artifacts of software systems.

UML can be applied to diverse application domains (e.g., banking, finance, internet, aerospace, healthcare, etc.) It can be used with all major object and component software development methods and for various implementation platforms.

UML is powerful enough to represent all the concepts that exist in object-oriented analysis and design. UML diagrams are representation of object-oriented concepts only. Thus, before learning UML, it becomes important to understand OO concept in detail.

Following are some fundamental concepts of the object-oriented world[3] –

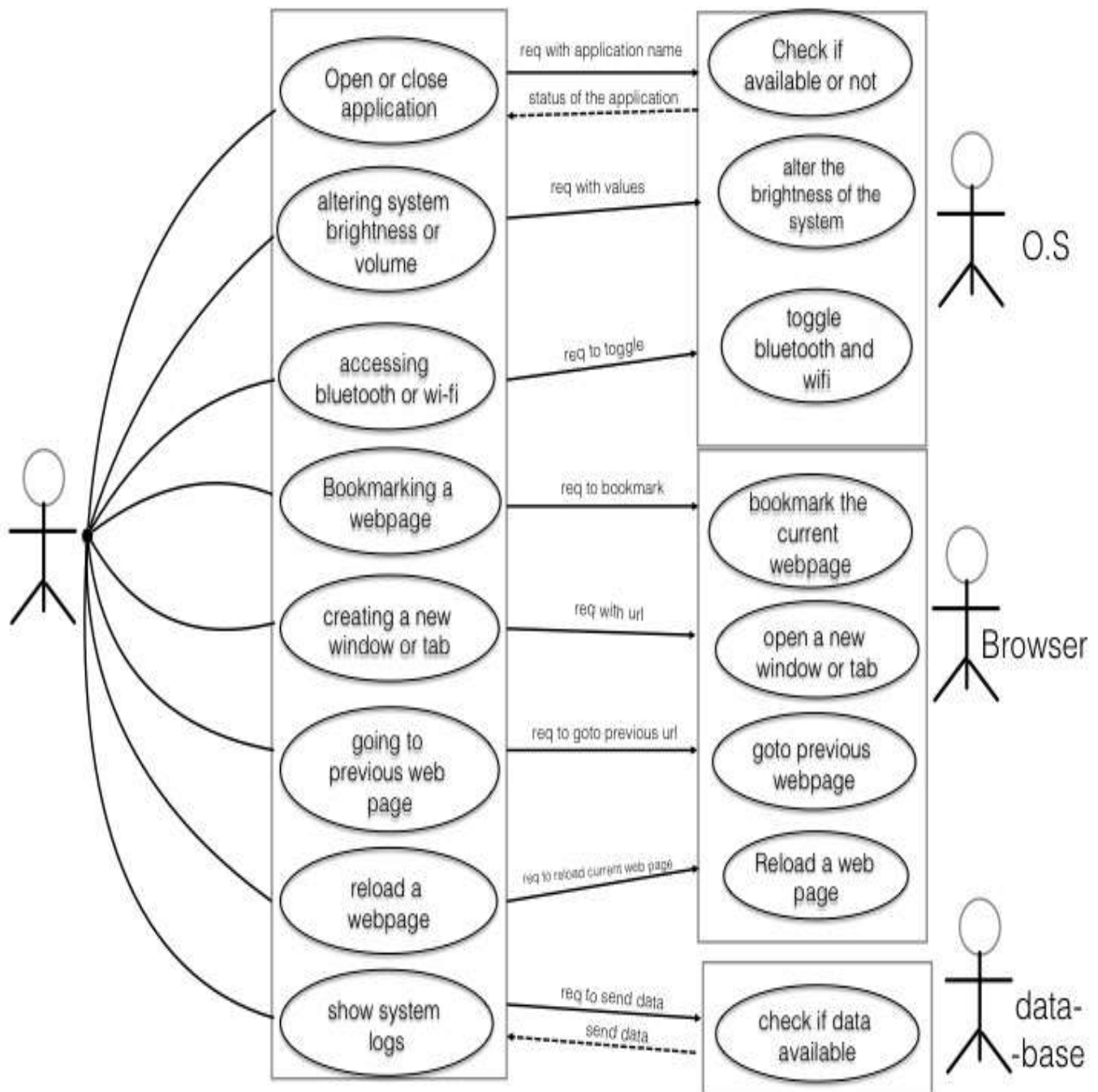
- **Objects** – Objects represent an entity and the basic building block.
- **Class** – Class is the blue print of an object.
- **Abstraction** – Abstraction represents the behavior of an real world entity.
- **Encapsulation** – Encapsulation is the mechanism of binding the data together and hiding them from the out side world.



- **Inheritance** – Inheritance is the mechanism of making new classes from existing ones.
- **Polymorphism** – It defines the mechanism to exists in different forms.

## Use-Case Diagrams:

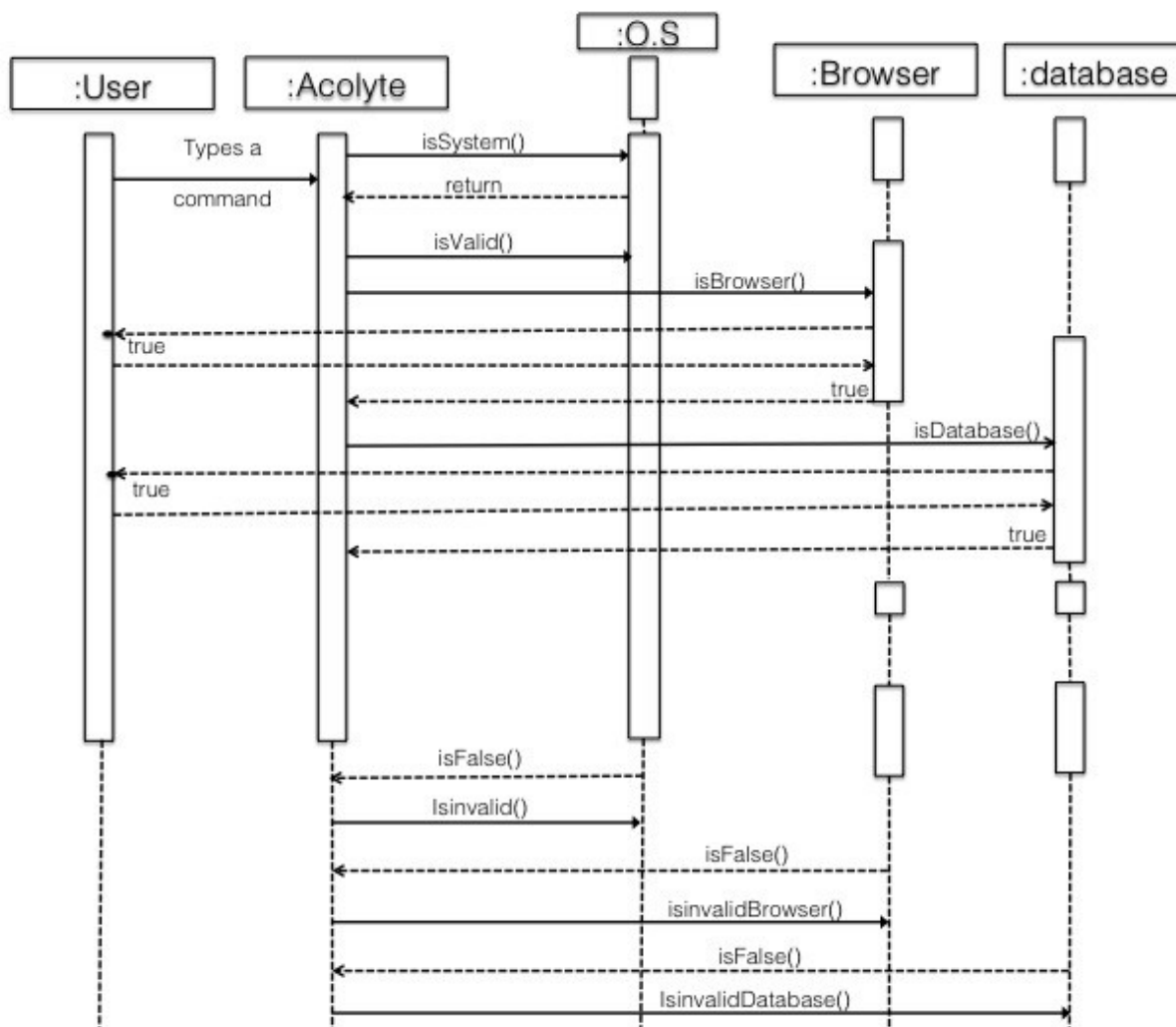
A use case is a set of scenarios that describe an interaction between a user and a system. A use case diagram displays the relationship among actors and use cases. The two main components of a use case diagram are use cases and actors.[1]



## State Sequence Diagram:

The **sequence diagram** is a specific kind of interaction diagram. Statechart diagrams describe the states of an individual object and the possible transitions .

- A sequence diagram represents a graphical description of objects participating in a single use case or scenario (illustrates communication between objects and flow of control)
- Arranged in general columns
- First item in each column is an actor, object, or class (using usual notation for these things):

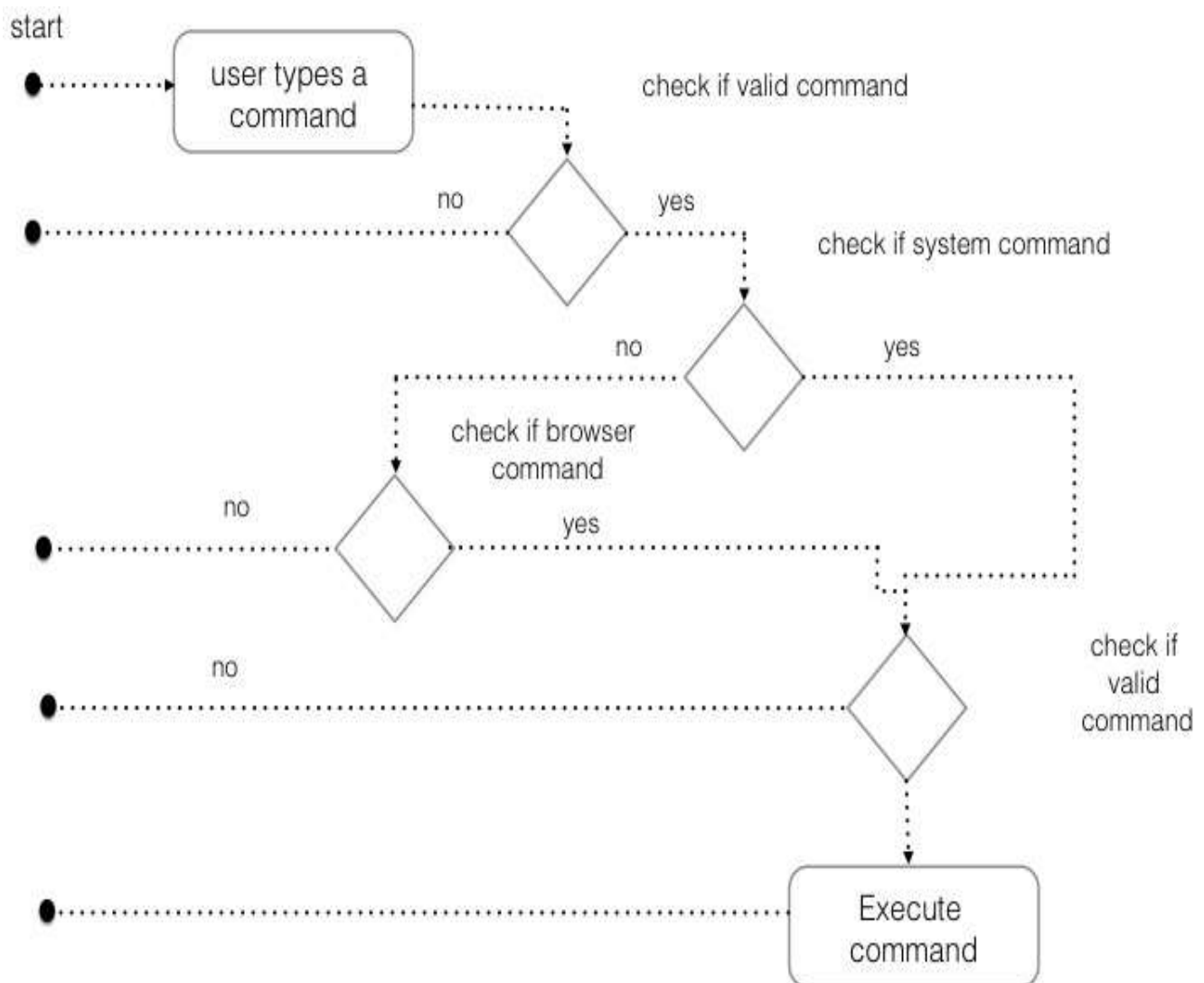


## Activity Diagram:

Activity diagram is basically a flowchart to represent the flow from one activity to another activity. The activity can be described as an operation of the system. The control flow is drawn from one operation to another. This flow can be sequential, branched, or concurrent. Activity diagrams deal with all type of flow control by using different elements such as fork, join, etc.

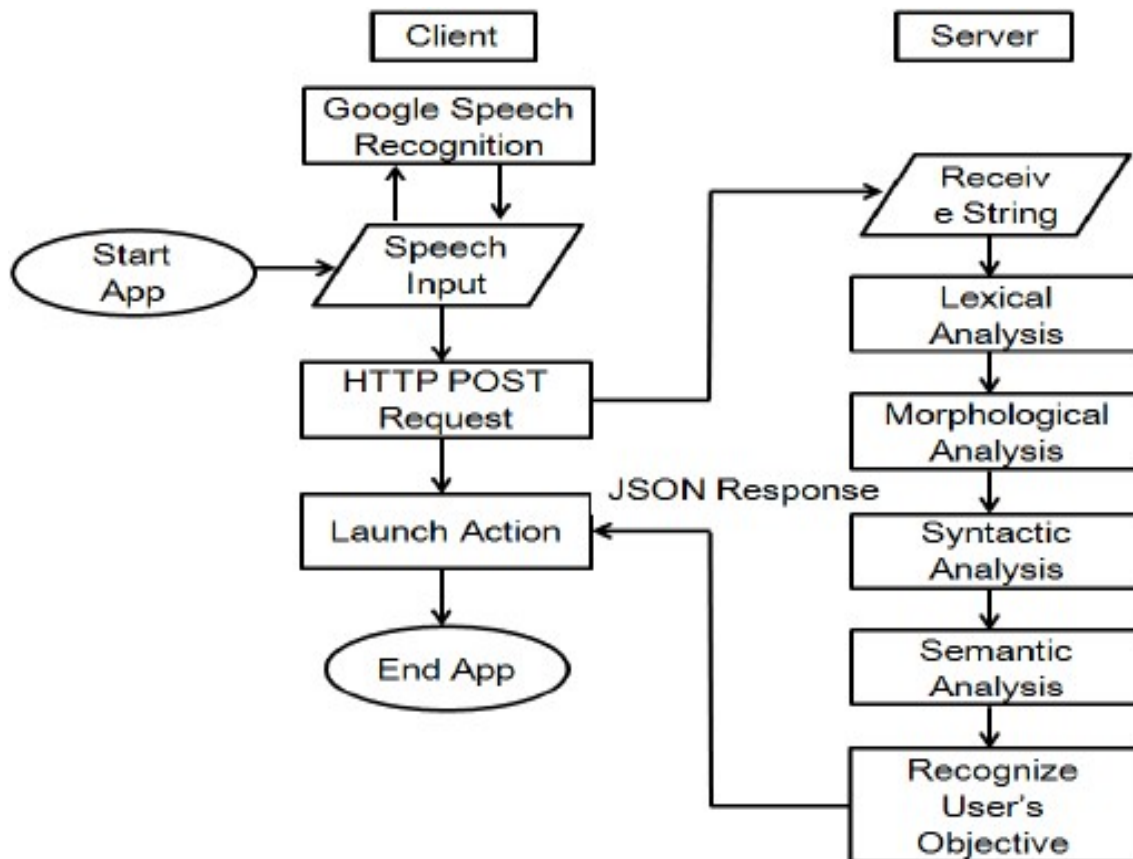
**USER INPUT IS CONVERTED INTO TEXT BY USING GOOGLE SPEECH TO TEXT.**

**PROCESSED FURTHER:**



## Data flow Diagram:

A data-flow diagram (DFD) is a way of representing a flow of a data of a process or a system (usually an information system). The DFD also provides information about the outputs and inputs of each entity and the process itself. A data-flow diagram has no control flow, there are no decision rules and no loops.[2]



# **CHAPTER-4**

# **Languages And IDE required for development**

## **4.1 PYTHON**

**Python**[1] is an interpreted, high-level, general-purpose programming language. Created by Guido van Rossum and first released in 1991, Python's design philosophy emphasizes code readability with its notable use of significant whitespace. Its language constructs and object-oriented approach aim to help programmers write clear, logical code for small and large-scale projects

Python interpreters are available for many operating systems. A global community of programmers develops and maintains CPython, an open source reference implementation. A non-profit organization, the Python Software Foundation, manages and directs resources for Python and CPython development.

Python is a dynamically typed and garbage-collected . It supports multiple programming paradigms, including structured (particularly, procedural), object-oriented, and functional programming. Python is often described as a "batteries included" language due to its comprehensive standard library.

## **4.2 Used IDE...**

**PyCharm** [1] is an [integrated development environment](#) (IDE) used in [computer programming](#), specifically for the [Python](#) language. It is developed by the Czech company [JetBrains](#). It provides code analysis, a graphical debugger, an integrated unit tester, integration with [version control systems](#) (VCSes), and supports web development with [Django](#) as well as [Data Science](#) with [Anaconda](#).

PyCharm[1] is [cross-platform](#), with [Windows](#), [macOS](#) and [Linux](#) versions. The Community Edition is released under the [Apache License](#), and there is also Professional Edition with extra features – released under a [proprietary license](#).

## 4.3 PostgreSQL

[PostgreSQL](#), often written as "Postgres" and pronounced "Poss-gres", is an open source [relational database](#) implementation frequently used by Python applications as a backend for data storage and retrieval.

PostgreSQL is the default database choice for many Python developers, including the Django team when testing the [Django ORM](#). PostgreSQL is often viewed as more feature robust and stable when compared to MySQL, SQLServer and Oracle. All of those databases are reasonable choices. However, because PostgreSQL tends to be used by Python developers the drivers and example code for using the database tend to be better documented and contain fewer bugs for typical usage scenarios. If you try to use an Oracle database with Django, you'll see there is far less example code for that setup compared to PostgreSQL backend setups.

## 4.4 Used python Libraries

pip install [SpeechRecognition](#)

pip install [beautifulsoup4](#)

pip install [vlc](#)

pip install [youtube-dl](#)

pip install [pyowm](#)

pip install [wikipedia](#)



## 4.5 Project Codes:

```
import pyttsx3
import speech_recognition as sr
import datetime
import wikipedia
import webbrowser
import os
import re
import cv2
import subprocess
import smtplib
import pyowm
```

### 4.5.1 Module 1:DATA-SET

```
greetings = ['hey there','hello','hey']
greet=['hey there ']
question = ['how are you', 'how are you doing']
responses = ["I'm fine"]
var1 = ['who made you', 'who created you']
var2 = ['It is a classified information.']
var3 = ['what time is it', 'what is the time', 'time']
var4 = ['who are you', 'what is you name']
cmd1 = ['open browser', 'open google']
cmd2 = ['play music', 'play songs', 'play a song', 'open music player']
cmd3 = ['tell a joke', 'tell me a joke', 'say something funny', 'tell something funny']
jokes = ['Can a kangaroo jump higher than a house? Of course, a house doesn't jump at all.', 'My dog used to chase people on a bike a lot. It got so bad, finally I had to take his bike away.', 'Doctor: Im sorry but you suffer from a terminal illness and have only 10 to live.Patient: What do you mean, 10? 10 what? Months? Weeks?!"Doctor: Nine.']]
cmd4 = ['open youtube', 'i want to watch a video','youtube']
cmd5 = ['tell me the weather', 'weather', 'what about the weather','how is the weather','tell me the weather']
cmd6 = ['exit', 'close', 'goodbye', 'terminate','abort','close this','exit this','abort the voice assistant','abort the va']
```

```
cmd7 = ['what is your color', 'what is your colour', 'your color', 'your color?']
colrep = ['right now its rainbow', 'right now its transparent', 'right now its non
chromatic']
cmd8 = ['what is you favourite colour', 'what is your favourite color']
cmd9 = ['thank you']
repfr9 = ['youre welcome', 'glad i could help you']
cmd10=['open microsoft word','open word','ms word','open ms word','start ms word']
cmd11=['open ms excel','ms excel','excel','start excel']
cmd12=['ms acess','acess','open ms acess','start ms acess']
cmd13=['power point','open ms power point','microsoft power point','start ms
powerpoint','open power point']
cmd14=['take photo','photo','take picture','take a snap','click me a photo','take a photo']
```

## **4.5.2 Module 2:VOICE-MODULATION**

```
voices=[]
engine = pyttsx3.init('sapi5')
voices = engine.getProperty('voices')
# print(voices[1].id)
engine.setProperty('voice', voices[1].id)
```

## **4.5.3 Module 3:VOICE-PROCESS**

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

#### 4.5.4 Module 4:Greetings from Veronica

```
def wishMe():
    hour = int(datetime.datetime.now().hour)
    if hour>=0 and hour<12:
        print("Good Morning!")
        speak("Good Morning")

    elif hour>=12 and hour<18:
        print("Good Afternoon!")
        speak("Good Afternoon")

    else:
        print("Good Evening!")
        speak("Good Evening")
    print("I am Veronica Sir how may I help you")
    speak("I am Veronica Sir how may I help you")
```

#### 4.5.5 Module 5:Veronica VOICE-INPUT MODULE

```
def takeCommand():
    r=sr.Recognizer()
    with sr.Microphone() as source:
        print("Listening.....")
        r.energy_threshold = 4000
        r.pause_threshold=1
        audio = r.adjust_for_ambient_noise(source)
        audio=r.listen(source)

    try:
        print("Recognizing.....")
        query=r.recognize_google(audio, language='en-in')
        print(f"User said: {query}\n")

    except Exception as e:
        print(e)
        print("Say that again please...")
```

```
    return "None"
return query
```

#### 4.5.6 Module 6:VERONICA ->MAIN FUNCTION

```
if __name__ == "__main__":
    wishMe()
    print("Say exit or goodbye to exit")
    while True:
        # if 1:
            query = takeCommand().lower()
            if query in greetings:
                print(greet[0])
                speak(greet)
                engine.runAndWait()

            elif query in question :
                speak(responses)
                print(responses)
                engine.runAndWait()

            elif 'wikipedia' in query:
                speak('Searching Wikipedia...')
                query = query.replace("wikipedia", "")
                results = wikipedia.summary(query, sentences=2)
                speak("According to Wikipedia")
                print(results)
                speak(results)

            elif 'open stackoverflow' in query:
                webbrowser.open("stackoverflow.com")

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

elif 'open code' in query:

```
codePath = "C:\\Users\\Govind Nair\\Desktop\\ss.py"  
os.startfile(codePath)
```

elif 'email' in query:

```
try:  
    speak("What should I say?")  
    content = takeCommand()  
    to = "rEmail@gmail.com"  
    sendEmail(to, content)  
    speak("Email has been sent!")  
except Exception as e:  
    print(e)  
    speak("Sorry my friend . I am not able to send this email")
```

elif query in var1:

```
speak('Sorry Access denied')  
engine.runAndWait()  
reply = random.choice(var2)  
print(reply)
```

elif query in var3:

```
strTime = datetime.datetime.now().strftime("%H:%M:%S")  
speak(f"Sir, the time is {strTime}")
```

elif query in var4:

```
speak('I am Veronica ')  
print('I am Veronica')  
engine.runAndWait()
```

elif query in cmd1:

```
webbrowser.open('www.google.com')
```

elif query in cmd2:

```
music_dir = 'C:\\Users\\Govind Nair\\Music'
songs = os.listdir(music_dir)
os.startfile(os.path.join(music_dir, songs[0]))
```

elif query in cmd3:

```
jokrep = random.choice(jokes)
speak(jokrep)
engine.runAndWait()
```

elif query in cmd4:

```
webbrowser.open('www.youtube.com')
```

elif query in cmd5:

```
reg_ex = re.search('current weather in (.*)', query)
if reg_ex:
    city = reg_ex.group(1)
    owm = OWM(API_key='ab0d5e80e8dafb2cb81fa9e82431c1fa')
    obs = owm.weather_at_place(city)
    w = obs.get_weather()
    k = w.get_status()
    x = w.get_temperature(unit='celsius')
    print('Current weather in %s is %s. The maximum temperature is %0.2f
and the minimum temperature is %0.2f degree celcius' % (city, k, x['temp_max'],
x['temp_min']))
    speak('Current weather in %s is %s. The maximum temperature is
%0.2f and the minimum temperature is %0.2f degree celcius' % (city, k,
x['temp_max'], x['temp_min']))
```

elif query in cmd6:

```
print('see you later')
speak('see you later')
engine.runAndWait()
exit()
```

```
elif query in cmd7:
    print(random.choice(colrep))
    speak(random.choice(colrep))
    engine.runAndWait()
    print('It keeps changing every micro second')
    speak('It keeps changing every micro second')
```

```
elif query in cmd8:
    print(random.choice(colrep))
    speak(random.choice(colrep))
    engine.runAndWait()
    print('It keeps changing every micro second')
    speak('It keeps changing every micro second')
```

```
elif query in cmd9:
    print(random.choice(repfr9))
    speak(random.choice(repfr9))
    engine.runAndWait()
```

```
elif query in cmd10:
    print('opening MS word')
    os.startfile('WINWORD.EXE')
```

```
elif query in cmd11:
    print('opening MS EXCEL')
    os.startfile('EXCEL.EXE')
```

```
elif query in cmd12:
    print('opening MS Access')
    os.startfile('MSACCESS.EXE')
```

```
elif query in cmd13:
    print('opening MS Power Point')
    os.startfile('POWERPNT.EXE')
```

```
elif query in cmd14:
```

```
camera = cv2.VideoCapture(0)
for i in range(1):
    return_value, image = camera.read()
    cv2.imwrite('opencv'+str(i)+'.png', image)
del(camera)
```



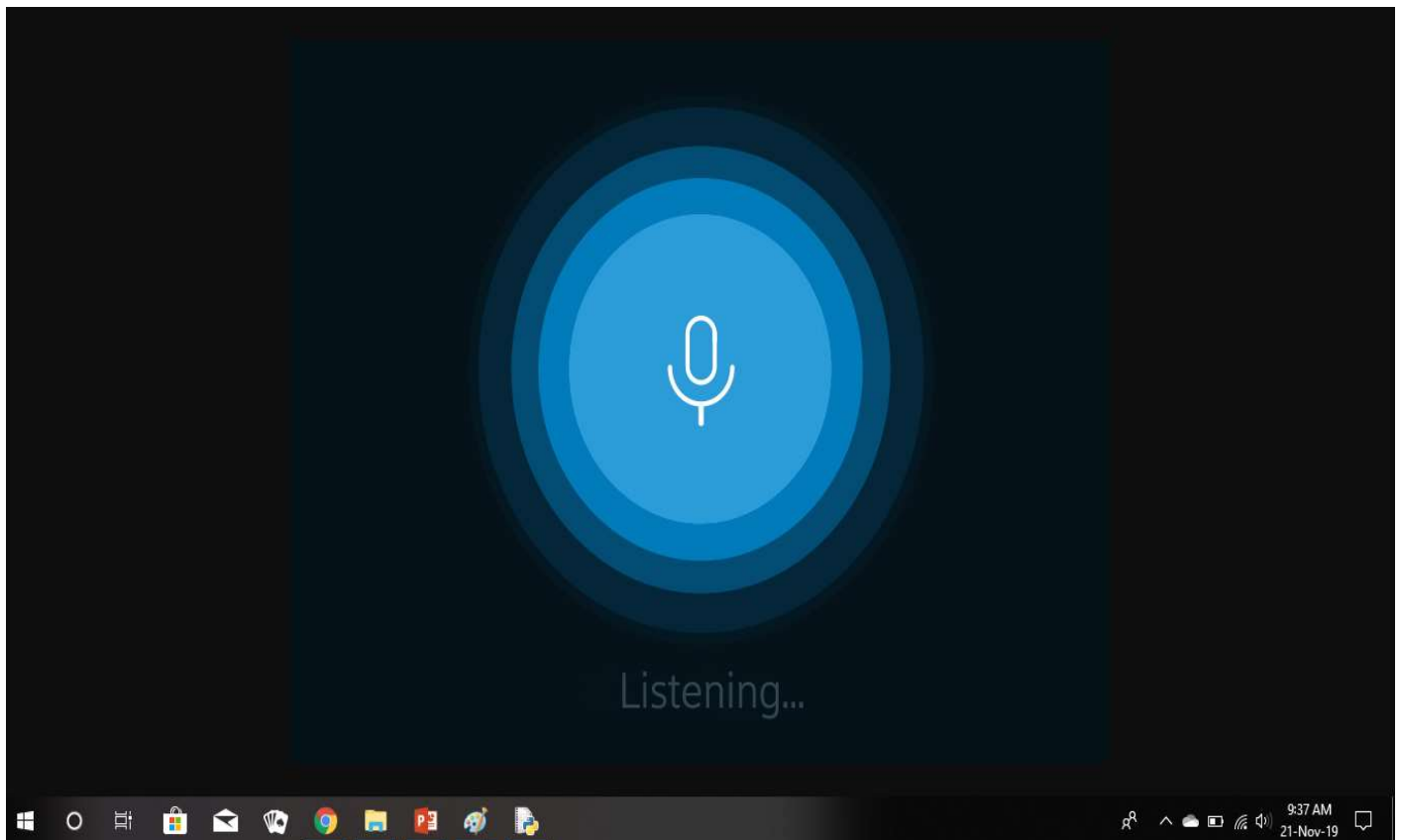
# **CHAPTER-5**

# INPUT / OUTPUT

## Different-Phases of VPA

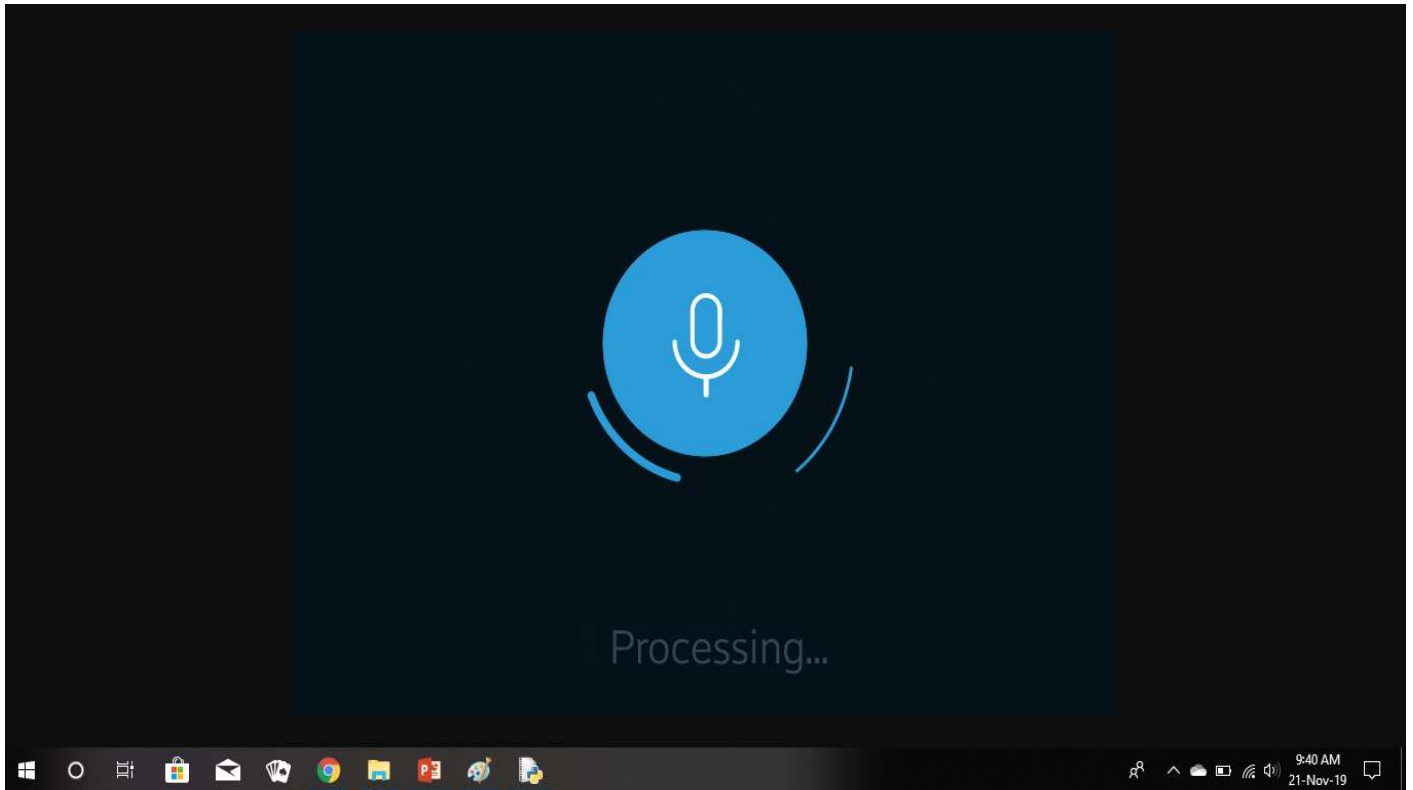
### Listening:-

Listening...



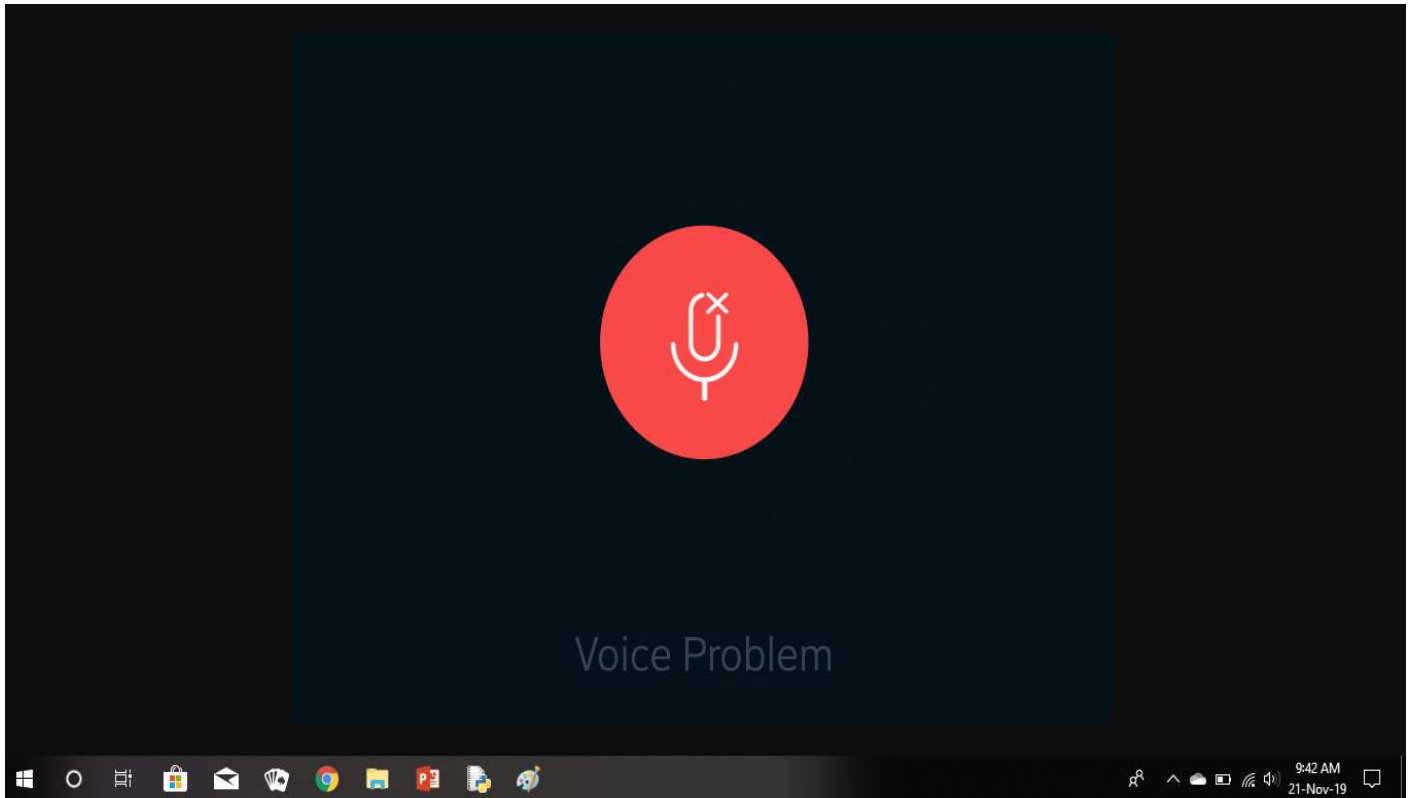
## Processing phase :-

Processing...

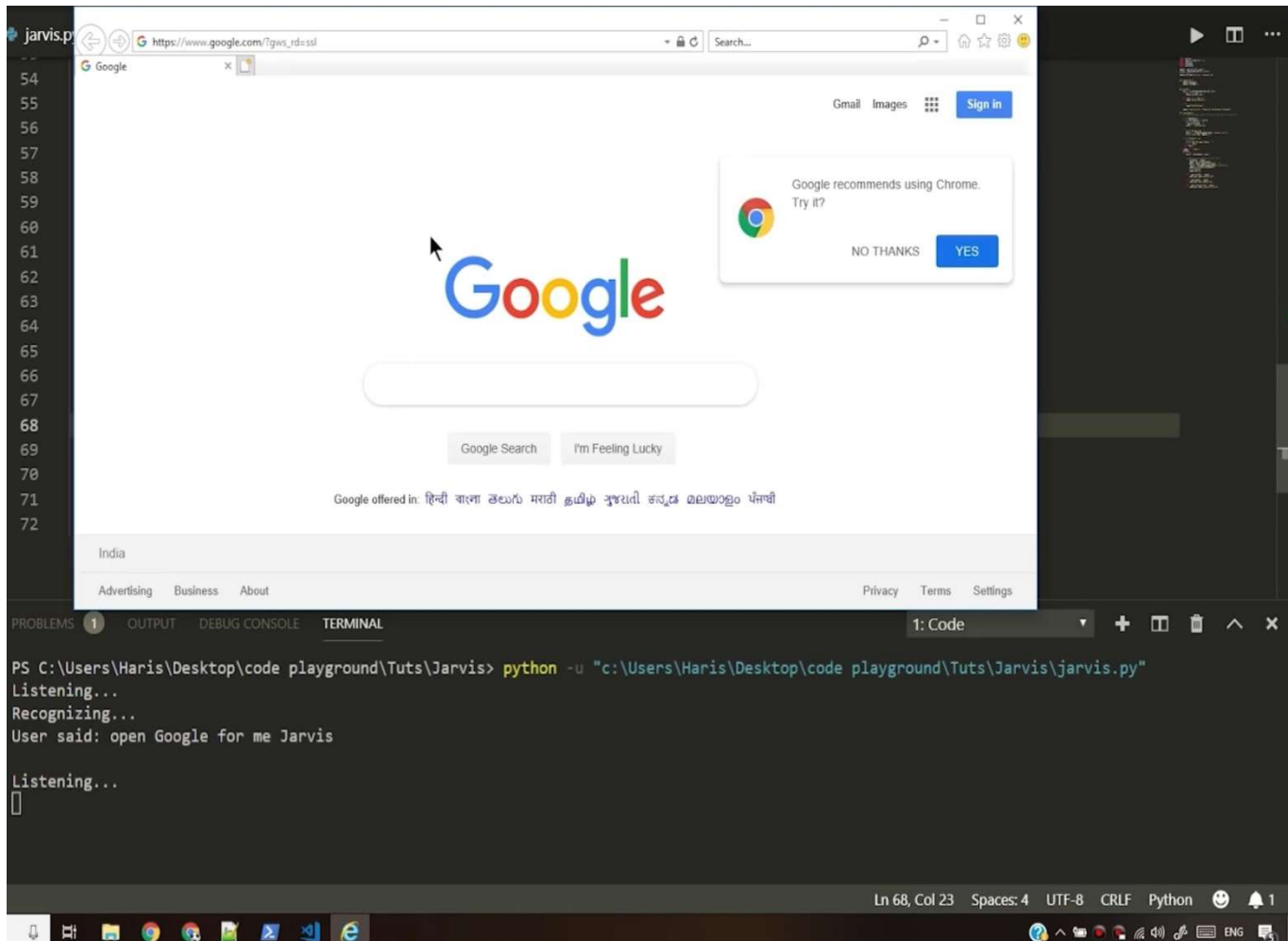


## **Problem failure indication :-**

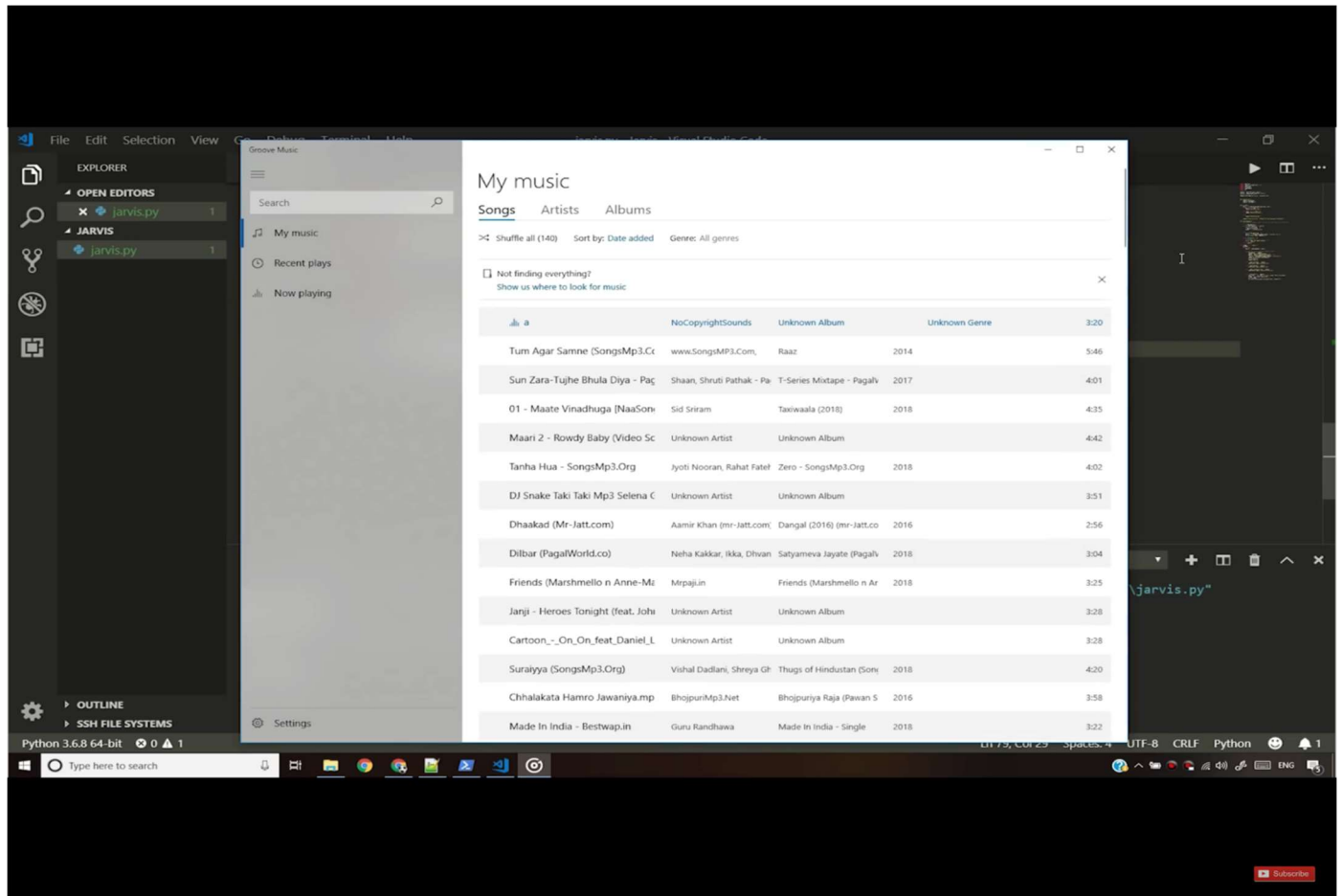
Error Occurred...



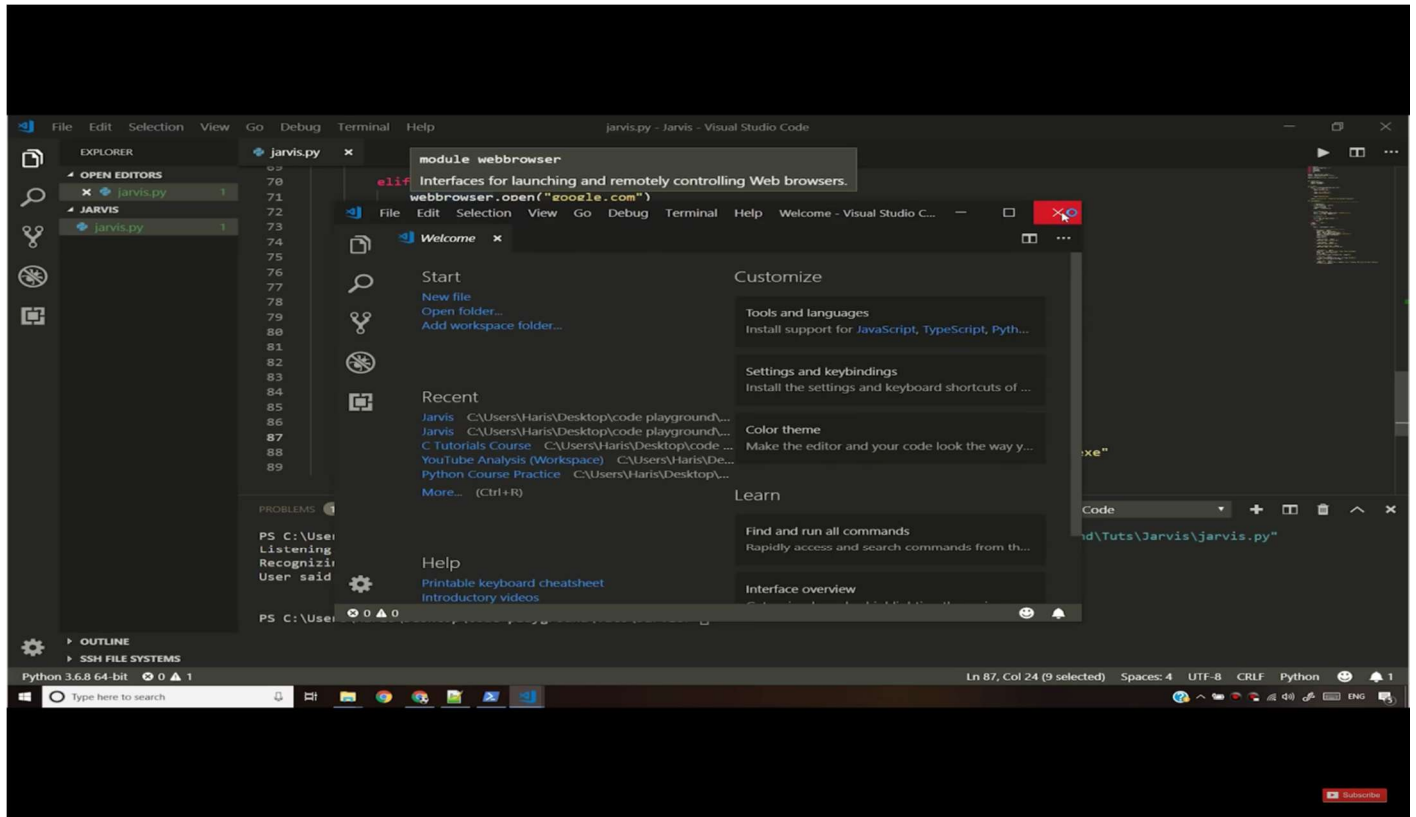
## Open Google.....



## Play Music.....

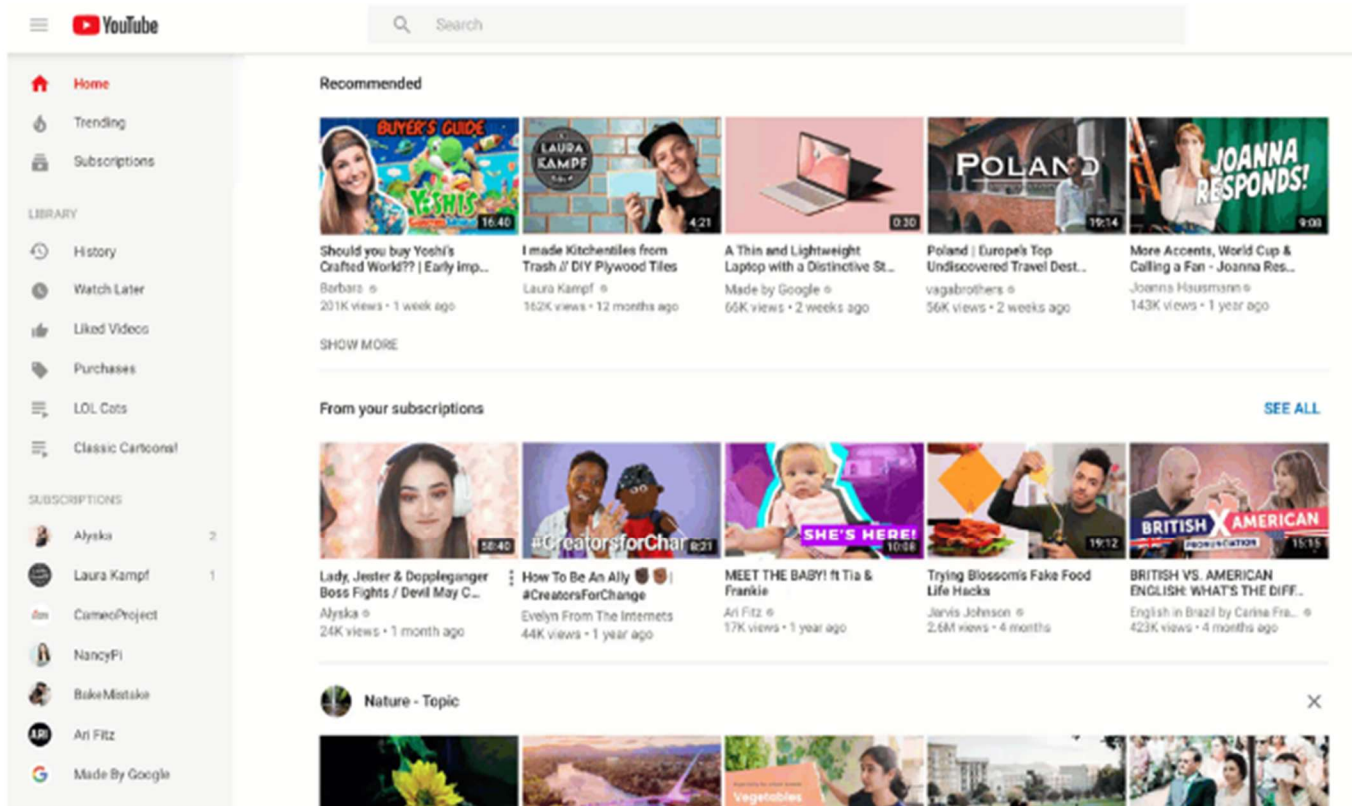


## Open Visual Studio Code.....

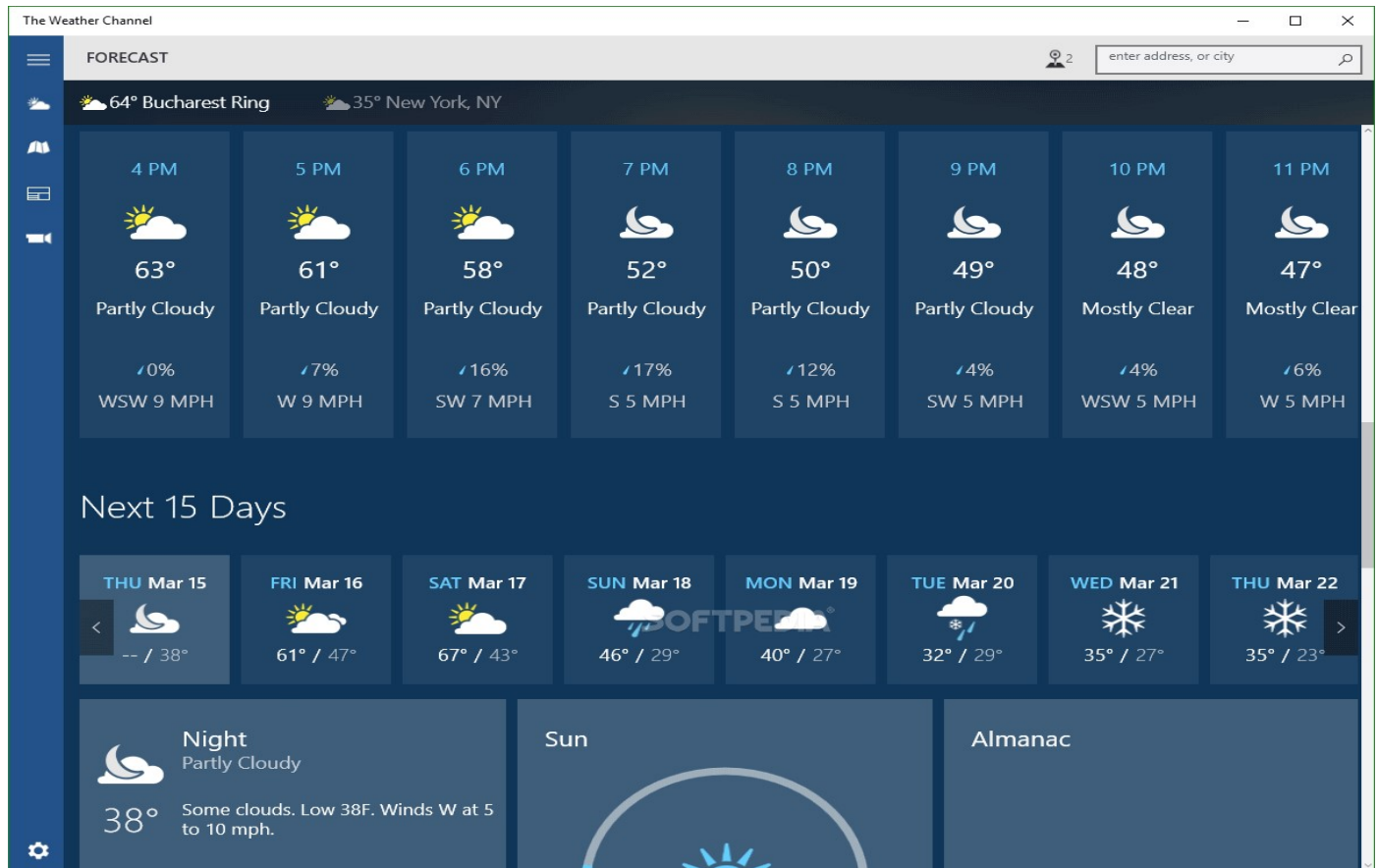




# Open YouTube....



## Open Weather Report.....



# **TESTING**

Testing is the process of evaluating a system or its component(s) with the intent to find whether it satisfies the specified requirements or not. Testing is executing a system in order to identify any gaps, errors, or missing requirements in contrary to the actual requirements.

## **✓ UNIT TESTING**

In Unit Testing each and program is tested individual using Dummy Records to see that program produce satisfied output and validation also the program Its output will effect for processing done by using a another program.

## **✓ CODE TESTING**

The code – Testing strategy examines the logic of program. The analyst develops test case result in executing every instruction in the Module. Every part of the program is tested.

## **✓ SYSTEM TESTING**

System testing is actually a series of different test whose primary Purpose is to fully exercise the computer base system where the software and other system element are tested as whole. Software, once validation, must be combining with other System element (e.g. hardware, people, and database). System testing verifies that all elements Mesh property and that overall system Function/ performance is achieved.

## **POST IMPLEMENTATION REVIEW**

Post implementation review is used for taking review of project. The most fundamental concern during post implementation review is determining whether the system has met its objective; that is, analysts want to know if the performance level of users has improved and if the system is producing the result intended. If neither is happening, one may question whether the system can be considered successful.

It is generally found that systems are easy to use, require less manpower, saves the data entry duplication work are accepted and well received by people. But still the following points have to consider.

- How have systems changed the cost of operation?
- How have systems changed the timeliness of information and reports user received?
- How have systems changed the completeness of the information?
- How have systems changed the way in which operations are performed?

# **FUTURE ENHANCEMENT**

## **Virtual Assistants, Today and Tomorrow**

Virtual assistant technology really came into its own in 2017, and as we journey into 2018, more promise is on the horizon. So, what can we expect from virtual assistants in the coming years?

### **Smarter Virtual Assistants**

Much of what virtual assistants do now are basic skills, such as retrieving data and basic computation. As natural language processing (NLP) continues to mature, virtual assistants will improve their comprehension and response capabilities, allowing for their use to become more widespread and complex. Also, as machine learning progresses,, we may see virtual assistants become smarter and begin to learn and predict customer needs.

### **Partnerships**

Currently, there are several different companies developing virtual assistant technology, each targeting their own devices and hardware. For example, Microsoft's Cortana works best with Windows 10 devices, Amazon's Alexa works best with Amazon Devices, and Google Home uses its own platform. Consumers haven't be able to transition between multiple platforms easily. In 2017, the first unexpected partnership developed between Microsoft and Amazon to integrate Cortana and Alexa. Alexa leads the household market, while Cortana leads the business market. This partnership may be the first step to seamless, integrated experience for customers.

## **Integration with IoT Devices**

Car speakers, smart home devices, and wearable's are just a few examples where the virtual assistant is departing from its original hardware and making its way to in-context devices. These integrations ensure that virtual assistants can always be near their human and ready to support any need. It is expected that these integrations will continue at an accelerated pace throughout 2018.

## **Bring Your Virtual Assistant to Work – the future state**

As consumers become more reliant on their virtual assistants in their personal lives, it's expected that demand will increase for virtual assistants in the workplace, with a delineation between the consumer market and enterprise. Virtual assistants are already emerging in the workplace as taskmasters, completing repetitive tasks and freeing up time for workers to focus on more complex tasks.

## **Voice-control of machines**

In the manufacturing world, many machines are starting to be operated through voice-control. In the office setting, it's possible that IT solutions could be run in the same fashion. Soon, we could be joining meetings with a voice command, instead of dialing in the long meeting ID and password.

Virtual assistant technology can extend to the personal assistant realm and handle these time consuming administrative tasks, leaving workers more time to focus on high-value tasks.

## **CONCLUSION**

Virtual Personal Assistants are very effective way to organize your schedule. Now there are many Smart Personal Digital Assistant applications available in market for various device platforms. These new Software Applications are performing really well than PDA devices as they provided with all resources of your smartphone. VPAs are also reliable than Human Personal Assistant because, VPAs are more portable and you can use them anytime. They also have lot of information than any assistant as they are connected with internet

**Virtual assistants** are a secret weapon of startup owners and busy entrepreneurs to boost productivity. Tasks such as Internet research, social media management, data entry can easily be delegated to a **virtual assistant**. So, don't try to do everything yourself.

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