A Project Report

On

"Mini Desktop Assistant"

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In partial fulfilment of requirements for the degree

Of

DIPLOMA ENGINEERING

In

Computer Engineering

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CERTIFICATE

Government Polytechnic, Gandhinagar
Computer Engineering
2022-2023

This is to certify that the project work embodied in this report entitled "**Mini Desktop Assistant**" was carried out by **Mr. Jattin Rathod, Mr. Darpan Makwana, Mr. Priyanshu Khambalkar, Mr. Raj Lalwani at Government Polytechnic, Gandhinagar** for partial fulfillment of Diploma degree to be awarded by Gujarat Technological University (GTU). This project work has been carried out under my supervision and is to the satisfaction of department.

Place: GP, Gandhinagar

Date:

Internal Guide	**Head of the Department**
Prof. Harshad.S. Modi /	**Prof. Manish Desai**
Prof. Ghyansham.B.Jadeja	

Acknowledgement

I sincerely feel the credit of the project work could not be narrowed down to only on individual. The development of this project involves many valuable contributions. Getting the opportunity for this project of "**Mini Desktop Assistant**" as fulfillment of diploma (computer engineering) has been brightening experience for the near future to come and a focus on excellence in this venture, we are constantly guided and encouraged by **Prof. Harshad.S.Modi / Prof. Ghyansham.B.Jadeja** who is our internal guide.

I would also thank our Head of the Department **Prof. Manish Desai** for giving us such a wonderful chance to work with this interesting project and perform the project work for the entire duration of the semester and also thanks to internal guide for project technical guidance and giving inspiration in all the way during project making. Finally, I would like to thank our parents, friends and almighty for being with us to support directly or indirectly while making this project.

Abstract

The advancement in technology over time has been unmeasurable. From the first digital computer built by Eniac having a clock speed of 100KHz to Summit developed by the US Department of Energy has a performance of 148.6 peta Flops, we have come a long way in technological advancement. In such an era of advancement if people are still struggling to interact with their machine using various input devices then it's not worth it. For this reason, many voice assistants were developed and are still being improved for better performance and efficiency. The main task of a voice assistant is to minimize the use of input devices like keyboard, mouse, touch pens, etc. This will reduce both the hardware cost and space taken by it.

The Most famous application is of iPhone "SIRI" which helps the end user to communicate end user 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. It is 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. In addition, this proposed system can change the way of interactions between end user and the mobile devices.

Table of Content

Chapter 1: Introduction

1.1 Project Summary

- Usually, user needs to manually manage multiple sets of applications to complete one task.
- There is need of a system that can manage tasks effortlessly
- Not too long ago, building an AI assistant was a small component of developers' capacities; however, nowadays, it is quite a realistic objective even for novice programmers. To create a simple personal AI assistant, one simply needs dedicated software and around an hour of working time. It would take much more time, though, to create something more advanced and conceptually innovative.
- We already have multiple virtual assistants. But we hardly use it. There are number of people who have issues in voice recognition. These systems can understand English phrases but they fail to recognize in our accent. Our way of pronunciation is way distinct from theirs. Also, they are easy to use on mobile devices than desktop systems. There is need of a virtual assistant that can understand different English accents work on desktop system.

1.2 Project Purpose

- Virtual assistants enable users to speak natural language voice commands in order to operate the device and its apps.
- The purpose of this project (mini desktop assistant software) is to help you to ease your day to day task.
- Voice based intelligent assistants need an invoking word or wake word to activate the listener, followed by the command. For my project the wake word is Baymax.

- This system is designed to be used efficiently on desktops.
- Personal assistant software improves user productivity by managing routine tasks of the user and by providing information from online sources to the user.

1.3 Project Scope

- The virtual assistants which are currently available are fast and responsive but we still have to go a long way. The understanding and reliability of the current systems need to be improved a lot.
- The assistants available nowadays are still not reliable in critical scenarios. The future of these assistants will have the virtual assistants incorporated with Artificial Intelligence which includes Machine Learning, Neural Networks, etc. and IoT.
- With the incorporation of these technologies, we will be able to achieve new heights. What the virtual assistants can achieve is much beyond what we have achieved till now.
- Most of us have seen Baymax, that is a virtual assistant developed by iron man which is although fictional but this has set new standards of what we can achieve using voice-activated virtual assistants.

1.4 Project Objective

- The objective of an intelligent virtual assistant is to answer questions that users may have.
- The main objective of this project is to perform tasks such as playing music and opening application, send/schedule emails and WhatsApp texts over voice command.
- Response are formulated using text-to-text speech featured.

Chapter 2: System Specification

2.1 Hardware Requirement

- Pentium-pro processor or later.
- RAM 512MB or more.

2.2 Software Requirement

- Windows 7(32-bit) or above.
- Chrome Driver.
- Selenium Web Automation.

2.3 Requirement Analysis

- Requirement's analysis encompasses those tasks that go into determining the needs or coordination to meet for new or altered product or project, taking account of the possibly conflicting requirement of the various stakeholders, analyzing document, validating and managing software or system requirements.
- Personal assistant software is required to act as an interface into the digital world by understanding user requests or commands and then translating into actions or recommendations based on agent's understanding of the world.
- There are two type of requirements
    1) Functional requirement
    2) Non-functional requirement

- Functional requirement
    - User
        - R1 Songs
          -Input: Play “song name” from Spotify
          -Output: “song name” is playing

        - R2 WhatsApp
          -Input: Send WhatsApp message to “person name”
          -Output: message send successful

        - R3 E-mail
          -Input: Send E-mail to “person name/Email Id”
          -Output: Email send successful

        - R4 Reminder
          -Input: Set reminder for “event” on “date”
          -Output: reminder set successful

        - R5 Information
          -Input: Give me information on “person name”’
          -output:

- Non-Functional Requirements

    - OS: OS must allow app to pass through security/fire wall like Windows & Linux
    - User must be familiar with the language the Desktop. Assistant is programmed to communicate through.

2.4 Constraint

1. Security could be an issue

- It emphasizes the importance of making sure your home WiFi network is secure by using strong passwords and regularly checking for and installing software updates. Also, smart speaker makers

install software onto their devices to make them secure, such as voice command encryption before they're transferred to the cloud.

2. Voice recognition isn't perfect

- Voice recognition has come a long way in recent years, and Amazon and Google's tech is among the best so far. However, it's still not perfect, and you might find that you still have to occasionally repeat yourself to make the smart speaker understand your command.

2.5 Assumptions & Dependencies

1. specific operating system will be available on the hardware designated for the software product

2. Better Internet Connectivity

2.6 Technology & Literature Review

- Python
  - Python is an OOPs (Object Oriented Programming) based, high level, interpreted programming language. It is a robust, highly useful language focused on rapid application development (RAD). Python helps in easy writing and execution of codes. Python can implement the same logic with as much as $1/5^{th}$ code as compared to other OOPs languages.
  - Python provides a huge list of benefits to all. The usage of Python is such that it cannot be limited to only one activity. Its growing popularity has allowed it to enter into some of the most popular and complex processes like Artificial Intelligence (AI), Machine Learning (ML), natural language processing, data science etc. Python has a lot of libraries for every need of this project. For JIA, libraries used are speech recognition to recognize voice, Pyttsx for text to speech, selenium for web automation etc.

- Python is reasonably efficient. Efficiency is usually not a problem for small examples. If your Python code is not efficient enough, a general procedure to improve it is to find out what is taking most the time, and implement just that part more efficiently in some lower-level language. This will result in much less programming and more efficient code (because you will have more time to optimize) than writing everything in a low-level language.

Speech Recognition

- The speech recognition module made use of the Google Speech Recognition API, which can be imported into Python with the command "import speech recognition as sr." This module is used to recognize the voice inquiry that the user has provided as input. This is a Google-provided and supported API that is available for free. This is a small API that aids in the compression of our application.

Date & Time

- To support date and time formats, the date and time module was imported. The DateTime module contains classes for manipulating dates and times. These classes offer a variety of capabilities for working with dates, times, and time intervals. In Python, date and date time are objects. The user may, for example, want to know the current date and time or schedule a task for a specific time. In short this module supports classes to manipulate date and time and perform operations according to it only.

Pyttsx3

- The pywhatkit module is a Python module. It is in charge of playing everything you wish to search for on YouTube. For example, if a user wants to play a song from YouTube, they can say "play song Dynamite" and the song will be played immediately.

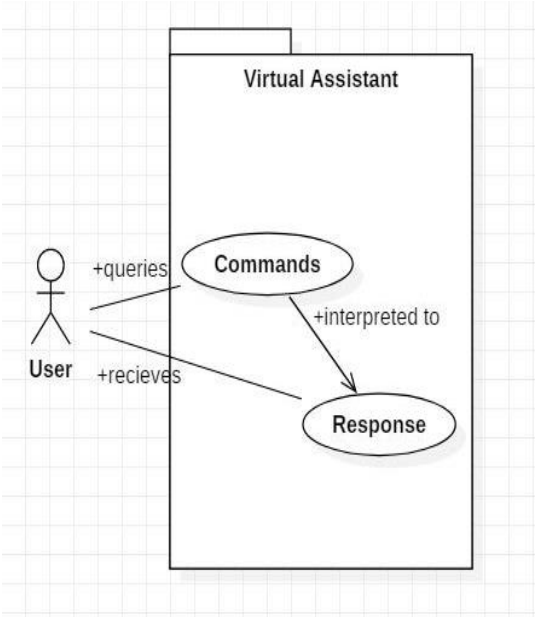
Web Browser

- This module enables the system to show information from the internet. It is a Python built-in module that provides every assistance to the user in obtaining information from the internet. For example, if a user says "open YouTube," the query is processed through the web browser module, and YouTube is opened.

- Random
  - The random module is a built-in module that is used to produce pseudo-random variables. It may be used to do random actions such as generating a random integer, picking random elements from a list, and shuffling elements at random. As an example, import random random. Seed (2)
- OS
  - The OS module in Python provides functions for communicate with the operating system. OS comes under Python’s standard utility modules. This module provides a portable way of using os-dependent functionality. The *os* and *os. Path* modules include many functions to interact with the file system. For example, if you want to current directory: os. getcwd () If you want open some application simple you do this: os. start file (adobe.exe)

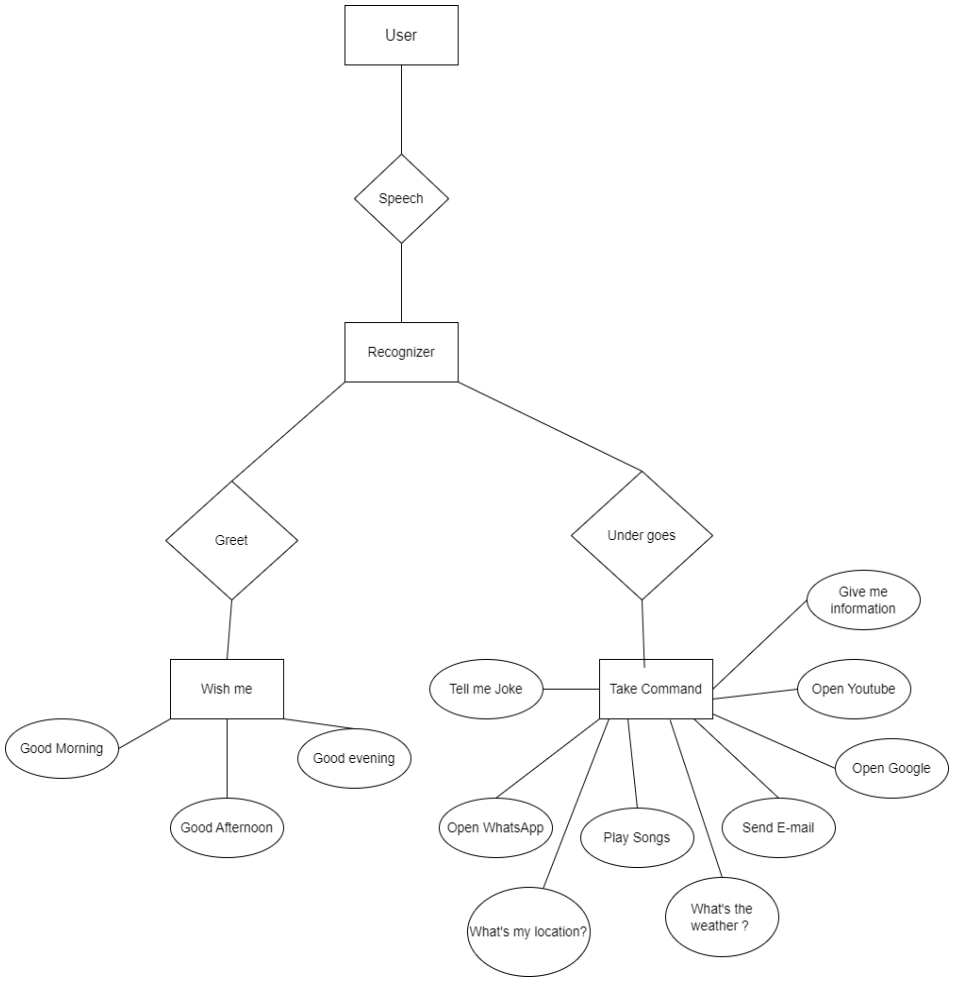
Chapter 3: System Diagram

3.1 Use-Case Diagram



- In this project there is only one user. The user queries command to the system. System then interprets it and fetches answer. The response is sent back to the user.

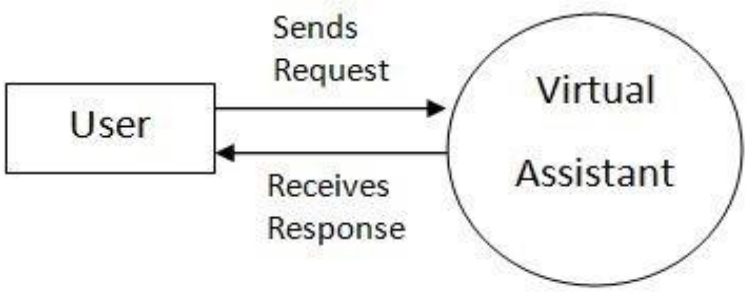
3.2 ER Diagram



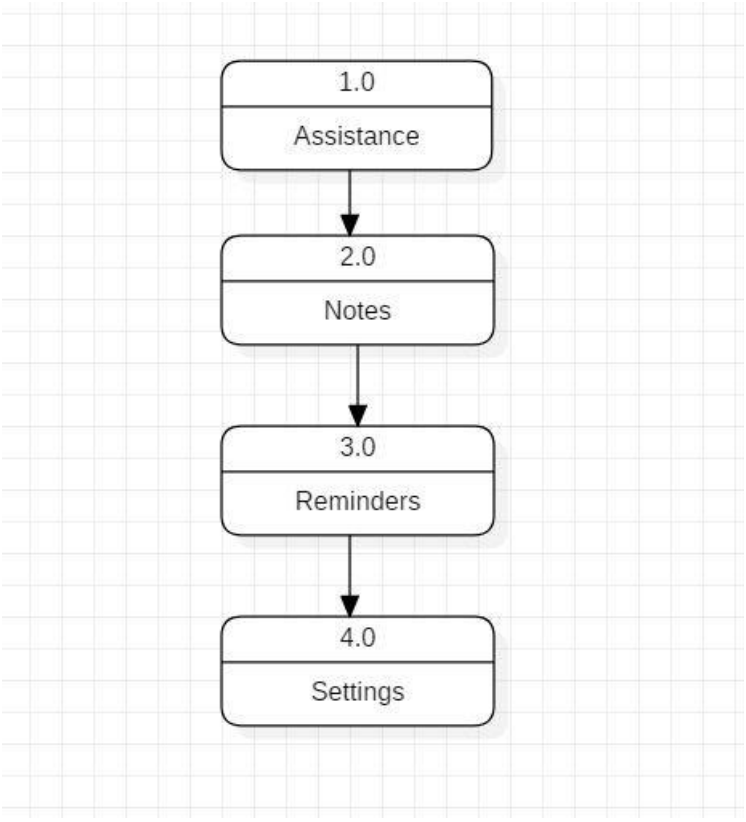
- The above diagram shows entities and their relationship for a virtual assistant system. We have a user of a system who can have their keys and values. It can be used to store any information about the user. Say, for key “name” value can be “Jim”. For some keys user might like to keep secure. There he can enable lock and set a password (voice clip).
- Single user can ask multiple questions. Each question will be given ID to get recognized along with the query and its corresponding answer. User can also be having n number of tasks. These should have their own unique id and status i.e. their current state. A task should also have a priority value and its category whether it is a parent task or child task of an older task

3.4 DFD Diagram

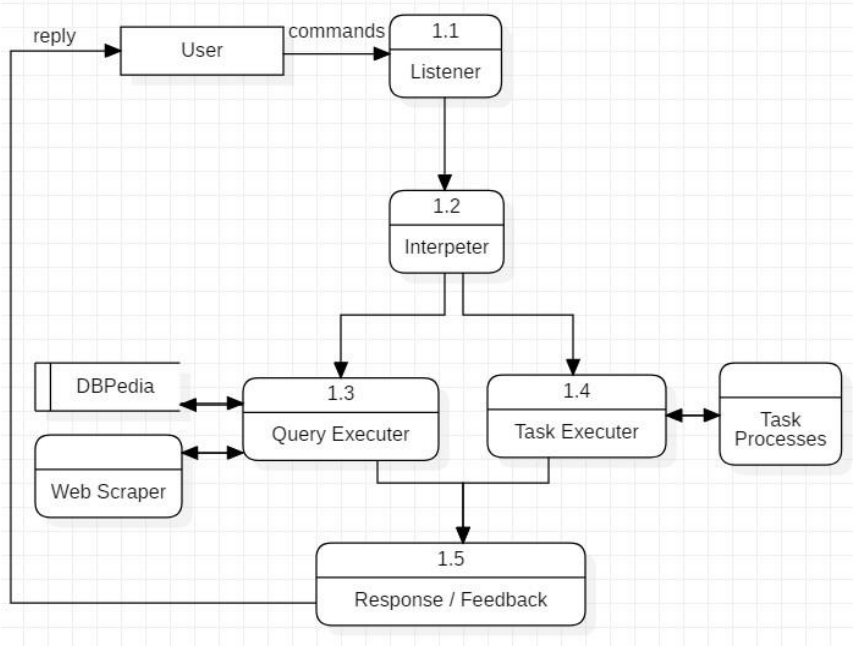
- DFD Level 0 (Context Level Diagram)



- DFD Level 1

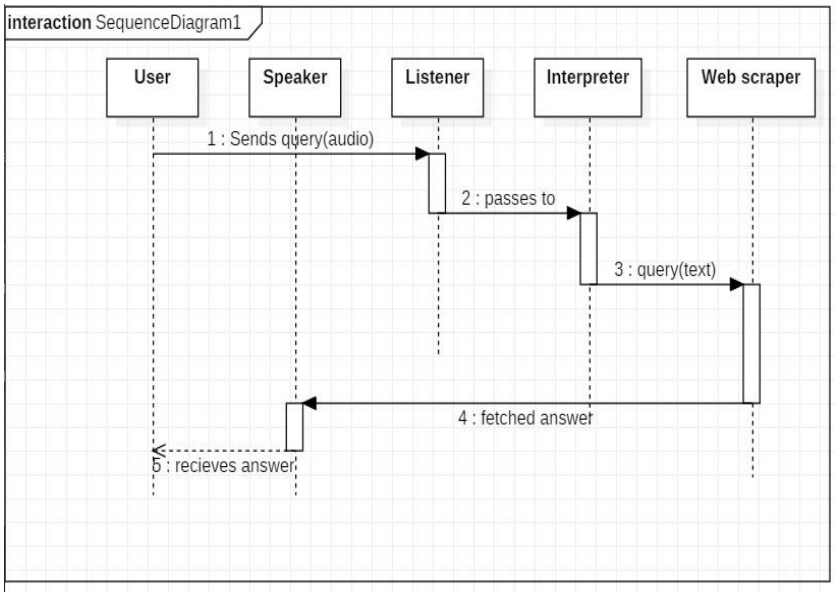


- DFD Level 2



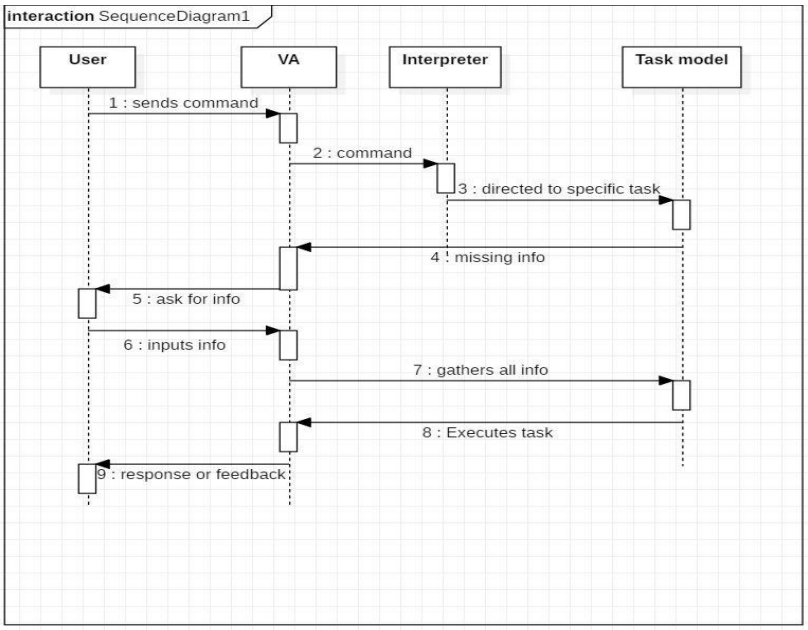
3.4 Sequence Diagram

- 3.4.1 Sequence diagram for Query-Response



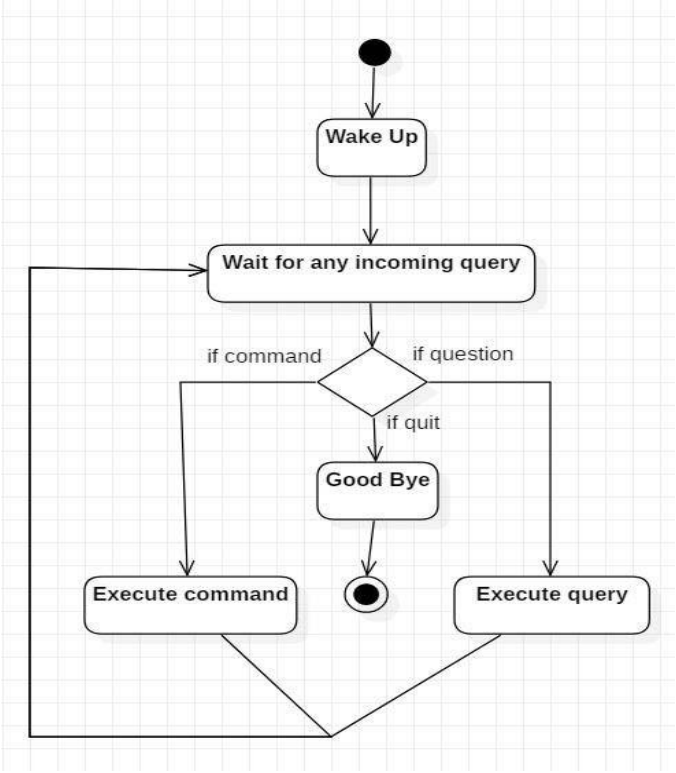
- The above sequence diagram shows how an answer asked by the user is being fetched from internet. The audio query is interpreted and sent to Web scraper. The web scraper searches and finds the answer. It is then sent back to speaker, where it speaks the answer to user

- 3.4.2 Sequence diagram for Task Execution



- The user sends command to virtual assistant in audio form. The command is passed to the interpreter. It identifies what the user has asked and directs it to task executer. If the task is missing some info, the virtual assistant asks user back about it. The received information is sent back to task and it is accomplished. After execution feedback is sent back to user.

3.5 Activity Diagram



- Initially, the system is in idle mode.
- As it receives any wake up Cal it begins execution.
- The received command is identified whether it is a questionnaire or a task to be performed. Specific action is taken accordingly.
- After the Question is being answered or the task is being performed, the system waits for another command. This loop continues unless it receives quit command.
- At that moment, it goes back to sleep.

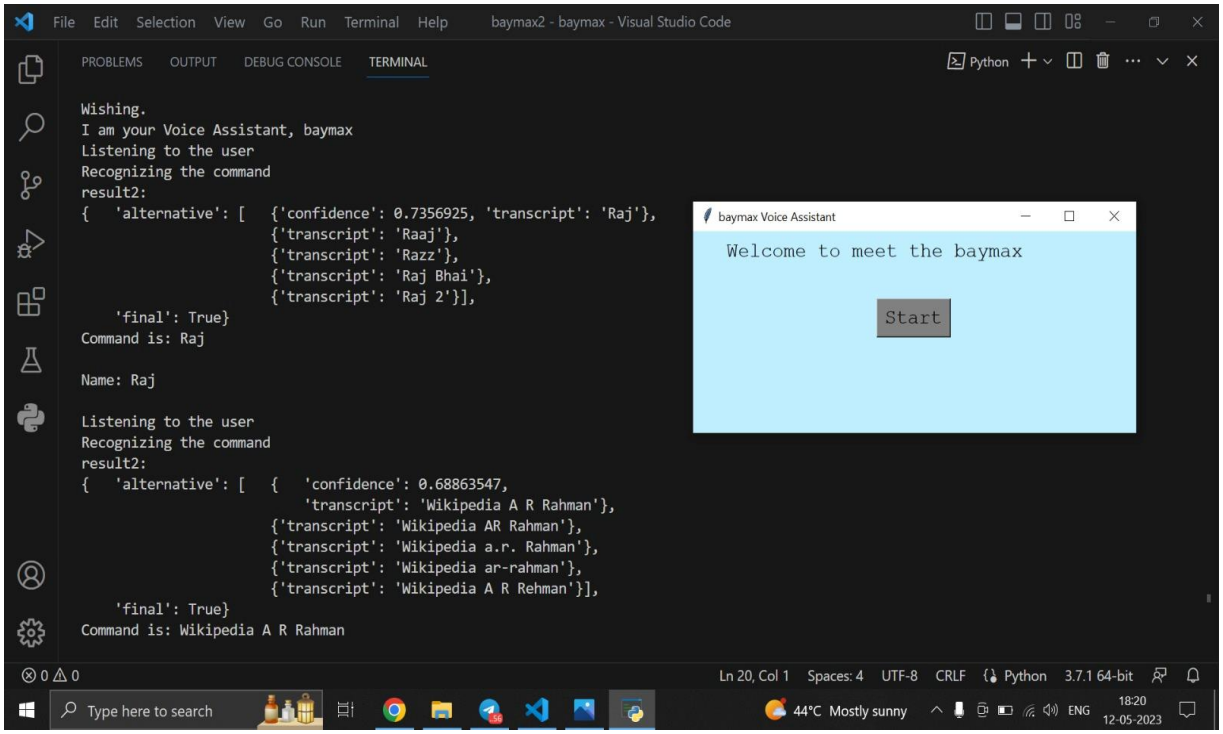
Chapter 4: Implementation & Planning

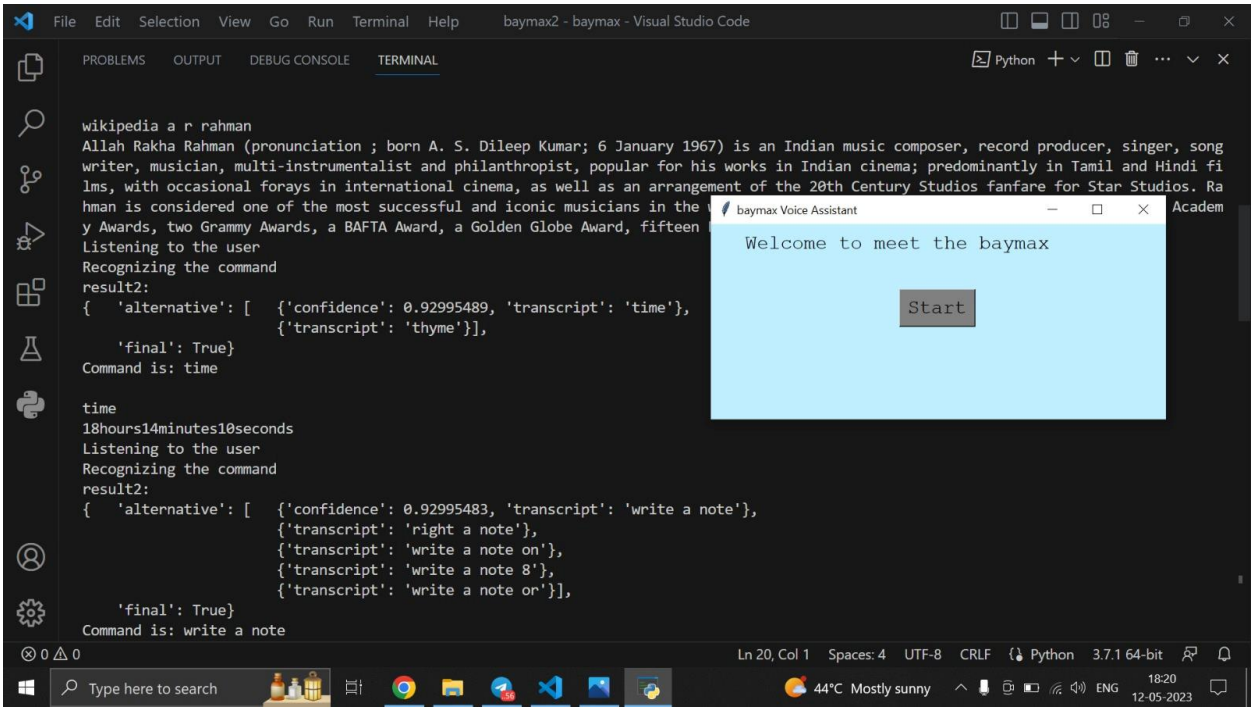
4.1 Implementation Environment

- Python
  - Python is an OOPs (Object Oriented Programming) based, high level, interpreted programming language.
  - Python helps in easy writing and execution of codes.
  - Python can implement the same logic with as much as $1/5^{th}$ code as compared to other OOPs languages.
  - Python provides a huge list of benefits to all. The usage of Python is such that it cannot be limited to only one activity.
  - Python has a lot of libraries for every need of this project.
  - Python is reasonably efficient. Efficiency is usually not a problem.

4.2 Snap-Shot

- On start wishing command will execute first by itself.
- The assistant will ask your name to recognize you.




File Edit Selection View Go Run Terminal Help baymax2 - baymax - Visual Studio Code
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
Python
wikipedia a r rahman
Allah Rakha Rahman (pronunciation ; born A. S. Dileep Kumar; 6 January 1967) is an Indian music composer, record producer, singer, song writer, musician, multi-instrumentalist and philanthropist, popular for his works in Indian cinema; predominantly in Tamil and Hindi films, with occasional forays in international cinema, as well as an arrangement of the 20th Century Studios fanfare for Star Studios. Rahman is considered one of the most successful and iconic musicians in the
Academy Awards, two Grammy Awards, a BAFTA Award, a Golden Globe Award, fifteen
Listening to the user
Recognizing the command
result2:
{ 'alternative': [{'confidence': 0.92995489, 'transcript': 'time'},
{'transcript': 'thyme'}],
'final': True}
Command is: time
time
18hours14minutes10seconds
Listening to the user
Recognizing the command
result2:
{ 'alternative': [{'confidence': 0.92995483, 'transcript': 'write a note'},
{'transcript': 'right a note'},
{'transcript': 'write a note on'},
{'transcript': 'write a note 8'},
{'transcript': 'write a note or'}],
'final': True}
Command is: write a note
baymax Voice Assistant
Welcome to meet the baymax
Start
Ln 20, Col 1 Spaces: 4 UTF-8 CRLF Python 3.7.1 64-bit
Type here to search
44°C Mostly sunny
ENG
18:20
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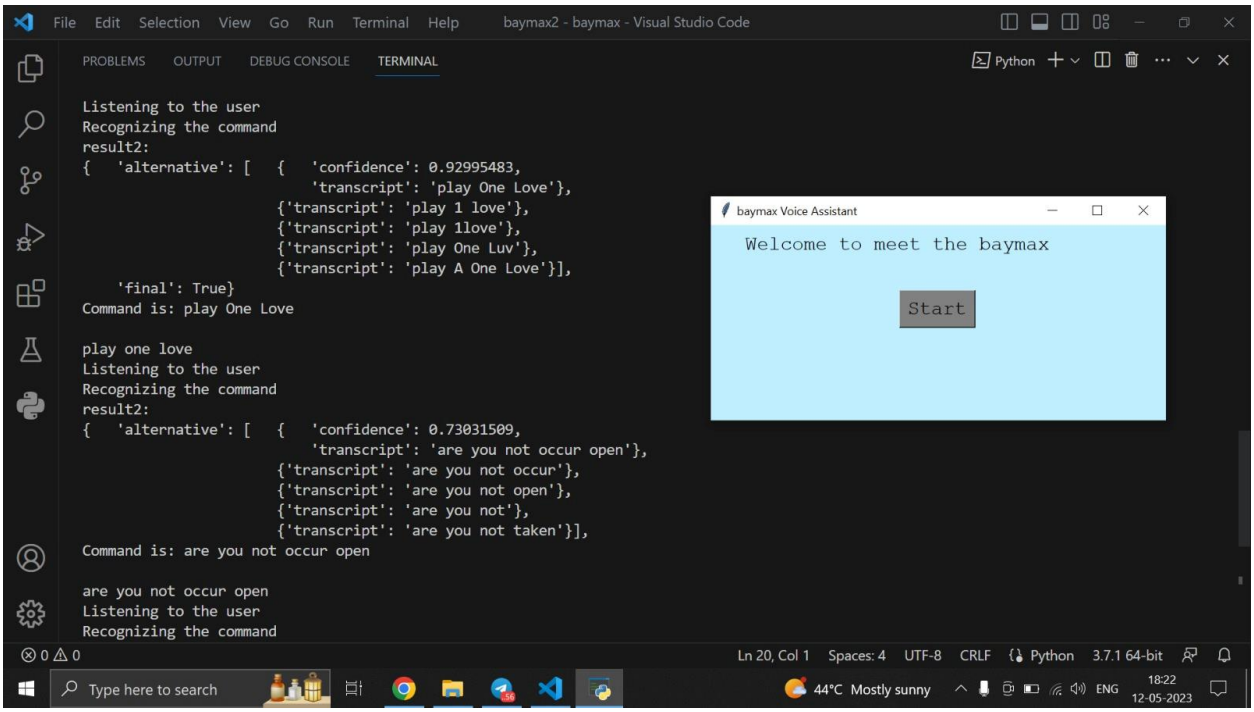
File Edit Selection View Go Run Terminal Help baymax2 - baymax - Visual Studio Code
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
Python
Listening to the user
Recognizing the command
result2:
{ 'alternative': [{ 'confidence': 0.92995483,
'transcript': 'play One Love'},
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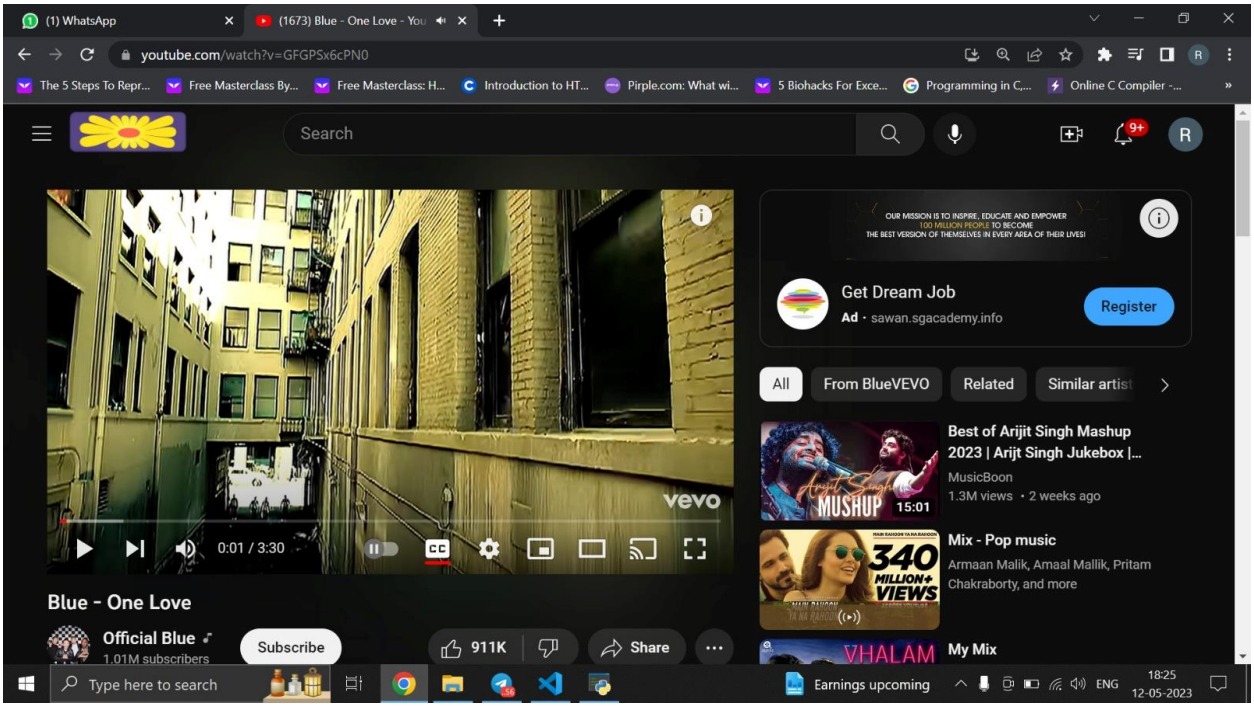
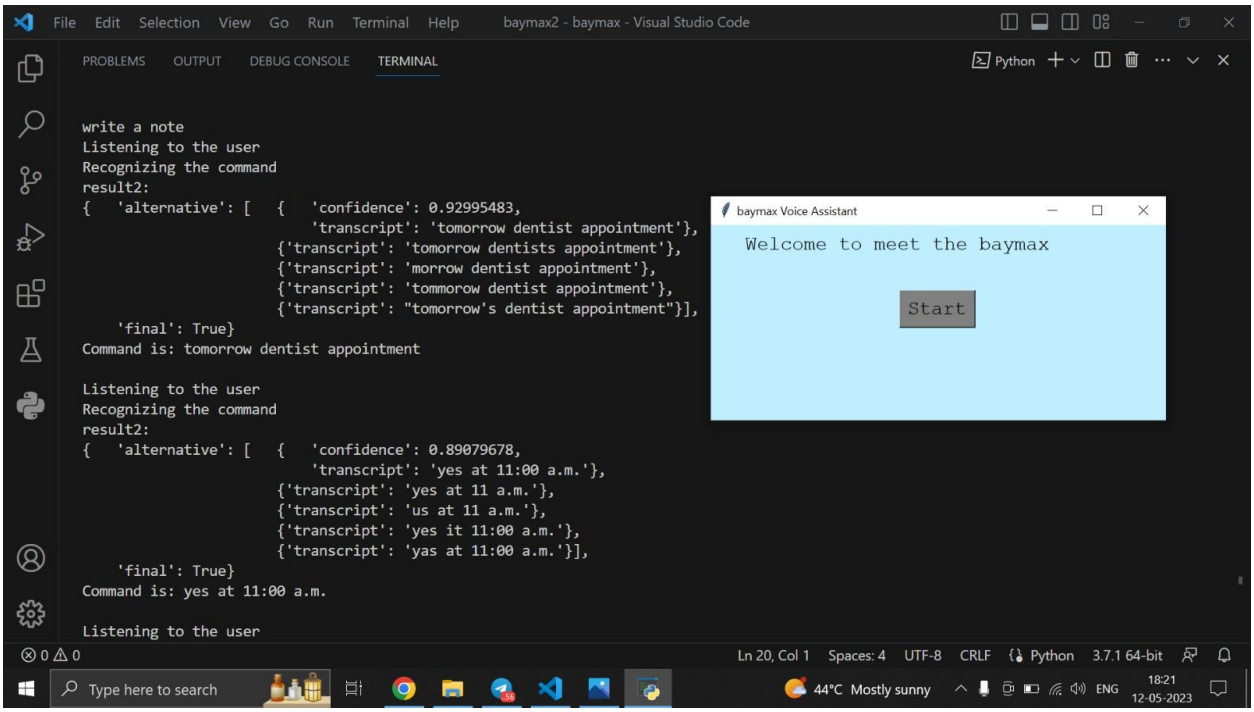
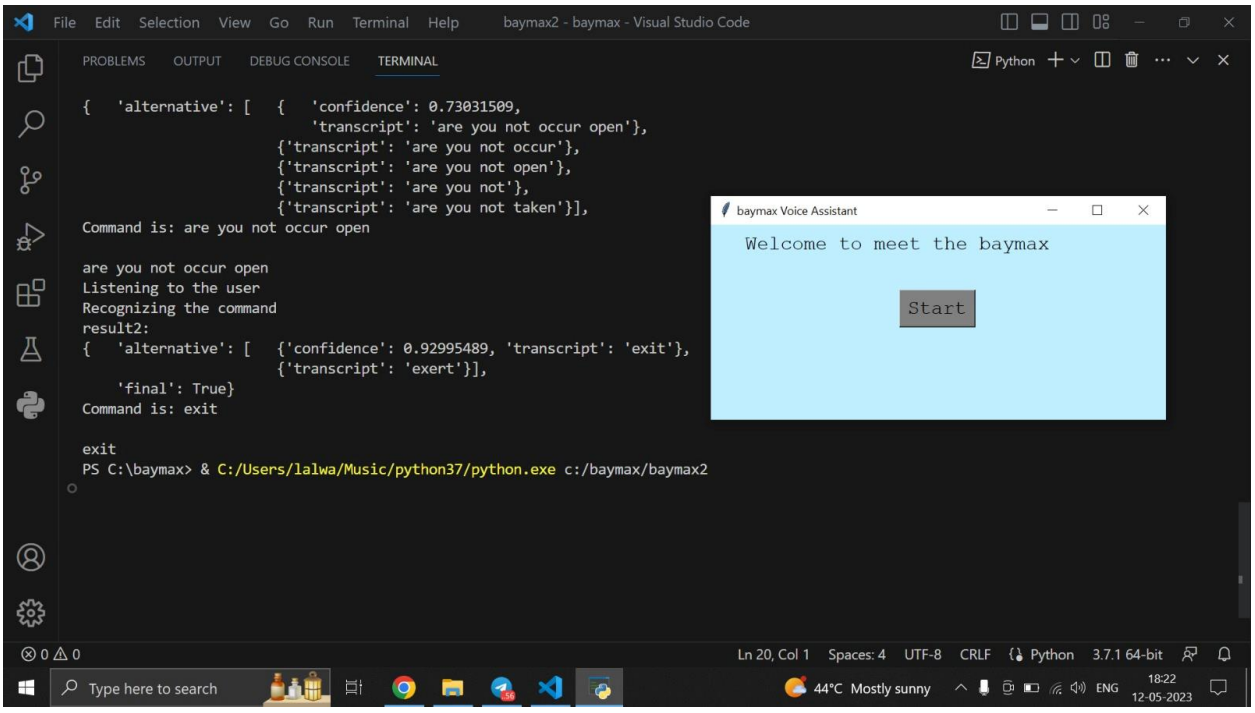
{'transcript': 'play 1love'},
{'transcript': 'play One Luv'},
{'transcript': 'play A One Love'}],
'final': True}
Command is: play One Love
play one love
Listening to the user
Recognizing the command
result2:
{ 'alternative': [{ 'confidence': 0.73031509,
'transcript': 'are you not occur open'},
{'transcript': 'are you not occur'},
{'transcript': 'are you not open'},
{'transcript': 'are you not'},
{'transcript': 'are you not taken'}],
Command is: are you not occur open
are you not occur open
Listening to the user
Recognizing the command
baymax Voice Assistant
Welcome to meet the baymax
Start
Ln 20, Col 1 Spaces: 4 UTF-8 CRLF Python 3.7.1 64-bit
Type here to search
44°C Mostly sunny
ENG
18:22
12-05-2023

➢ Output of the YouTube command.







- Exit command will shut down the assistant temporary you can awake assistant by clicking on the start button.

Chapter 5: Conclusion

- In this report, we discussed a Python-based Voice Activated Personal Assistant. This assistant currently works online and performs basic tasks such as music streaming, opening desktop applications, and so on. The current system's functionality is limited to working only online. Machine learning will be incorporated into the system in future updates of this assistant, resulting in better suggestions with IoT to control nearby devices, similar to what Amazon's Alexa does.

Chapter 6: Future Work

- Virtual assistants are now available and are quick and responsive, but there is still a long way to go. The current systems' understanding and reliability need to be greatly enhanced. In crucial situations, the helpers available now are still unreliable. Virtual assistants will be merged with Artificial Intelligence, such as Machine Learning, Neural Networks, and IoT, in the future of these assistants. We will be able to reach new heights by incorporating these technologies. What virtual assistants can accomplish is far beyond what we have accomplished thus far. Although Baymax, a voice-activated virtual assistant created by Iron Man, is fictional, it has set new expectations for what we can achieve with voice-activated virtual assistants.

Chapter 7: Bibliography & Reference

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- Code With Harry : https://youtu.be/Lp9Ftuq2sVI
- Programming Hero : https://youtu.be/AWvsXxDtEkU

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