# DESKTOP ASSISTANT (ANNY)

**A PROJECT REPORT**

***Submitted by***

**Yashvi Soni (18BECE30562)**
**Ashna Shah (18BECE30506)**
**Nidhi Patel (18BECE30109)**
**Nikita Solanki (18BECE30111)**

***In fulfilment for the award of the degree of***

**BACHELOR OF ENGINEERING**
***in***

Computer Engineering


**LDRP Institute of Technology and Research, Gandhinagar**

**Kadi Sarva Vishwavidyalaya**

**September, 2021**

# LDRP INSTITUTE OF TECHNOLOGY AND RESEARCH, GANDHINAGAR

**CE Department**

# CERTIFICATE

This is to certify that the Project Work entitled **"Desktop Assistant"** has been carried out by **Yashvi Soni (18BECE30562)** under my guidance in fulfilment of the degree of Bachelor of Computer Engineering in Semester-7 of Kadi Sarva Vishwavidyalaya University during the academic year 2020-21.

| | |
|---|---|
| Prof. Manoj Sahu | Dr. Shivangi Surati |
| **Internal Guide** | **Head of the Department** |
| **LDRP-ITR** | **LDRP-ITR** |

# LDRP INSTITUTE OF TECHNOLOGY AND RESEARCH, GANDHINAGAR

**CE Department**


# CERTIFICATE

This is to certify that the Project Work entitled **"Desktop Assistant"** has been carried out by **Ashna Shah (18BECE30506)** under my guidance in fulfilment of the degree of Bachelor of Computer Engineering in Semester-7 of Kadi Sarva Vishwavidyalaya University during the academic year 2020-21.

| | |
|---|---|
| Prof. Manoj Sahu | Dr. Shivangi Surati |
| **Internal Guide** | **Head of the Department** |
| **LDRP-ITR** | **LDRP-ITR** |

# LDRP INSTITUTE OF TECHNOLOGY AND RESEARCH, GANDHINAGAR

**CE Department**

# CERTIFICATE

This is to certify that the Project Work entitled **"Desktop Assistant"** has been carried out by **Nidhi Patel (18BECE30109)** under my guidance in fulfilment of the degree of Bachelor of Computer Engineering in Semester-7 of Kadi Sarva Vishwavidyalaya University during the academic year 2020-21.

| | |
|---|---|
| Prof. Manoj Sahu | Dr. Shivangi Surati |
| **Internal Guide** | **Head of the Department** |
| **LDRP-ITR** | **LDRP-ITR** |

# LDRP INSTITUTE OF TECHNOLOGY AND RESEARCH, GANDHINAGAR

**CE Department**

# CERTIFICATE

This is to certify that the Project Work entitled **"Desktop Assistant"** has been carried out by **Nikita Solanki (18BECE30111)** under my guidance in fulfilment of the degree of Bachelor of Computer Engineering in Semester-7 of Kadi Sarva Vishwavidyalaya University during the academic year 2020-21.

| | |
|---|---|
| Prof. Manoj Sahu | Dr. Shivangi Surati |
| **Internal Guide** | **Head of the Department** |
| **LDRP-ITR** | **LDRP-ITR** |

# ACKNOWLEDGEMENT

In the present world of competition, there is a race of existence in which those having the will to come forward, succeed. A project is like a bridge between theoretical and practical work. With this willingness, we started this particular Project. In completing this project report on project titled DESKTOP ASSISTANT, we had to take the help and guideline of a few respected people, who deserve my greatest gratitude.

We are feeling highly obliged in taking the opportunity to sincerely thank Dr. Shivangi Surti (Head of Dept. Computer at LDRP - ITR, Gandhinagar) and special thanks to our worthy project guide Prof. Manoj Sahu for his guidance. Moreover, we are highly obliged in taking the opportunity to sincerely thank all the staff members of the computer department for their generous attitude and friendly behaviour. And last but not the least, we are thankful to all our teachers and friends who have been always helping and encouraging us throughout the year. We have no valuable words to express our thanks, but our hearts are still full of the favours received from every person.

With Regards,

Yashvi Soni

Ashna Shah

Nidhi Patel

Nikita Solanki

Department of Computer Engineering,

LDRP - ITR, KSV University,

Gandhinagar - 382015

Gujarat, India.

# ABSTRACT

Communication and Technology has a long history but still constantly and actively growing and changing. The technology changes so fast that today everybody has an AI Personal assistant. Most of us have it on our phones in the form of Google assistant or Siri or Bixby. The use of voice based personal assistants is increasing day by day and helping in making our life simple. This project present intelligent voice assistant with ability to organize and maintain information it includes the greetings, name, system time, google search, you tube search, get stock price, weather, stone paper scissors, toss a coin, calc, take a screenshot, exit/bye, open wikipedia, dice-roll, play a song, open ppt, open camera, open terminal / cmd, open settings, open Control panel, open calc, open notepad, open paint, etc.

The attempt has been made to develop an “Intelligent Personal Voice Assistant using Python” which helps people to control device with their voice(speech), extract information and perform tasks on their desktop.

# LIST OF FIGURES

# TABLE OF CONTENTS

# 1 INTRODUCTION

- **PROJECT INTRODUCTION**
- **AIMS AND OBJECTIVE OF THE WORK**
- **PLAN OF THE WORK**

## 1.1 Project Introduction

Intelligent Voice Personal Assistant is software that has been developed design to assist user with basic tasks, usually providing information using natural language. Most of voice assistants use online resources to answer a user's questions about the weather, sport scores, to provide driving directions and to answer similar information-based queries and also provide services, such as calendar and meeting reminders while many offers essential services, like health monitoring and alerts via special applications. Typically, an Intelligent Personal Assistants will answer queries and perform actions via voice commands using a natural language user interface. Some examples of commonly known assistants: Siri, Google Assistant, Alexa or Cortana. In year 2020, there are estimated 3.5 billion voice assistants being used in smart devices around the globe. Voice assistants, an increasingly common place feature of many consumers. The abilities of voice assistant are so good that the demand of voice assistants will reach around 8 billion by 2023 more than the world's population. Voice assistants comes in small packages and can perform a variety of task and actions after hearing a wake-up word or command. They can play music, turn on the lights, they can answer any question and also place an order for you. It is a digital assistant that uses voice recognition, natural language processing and speech synthesis to provide aid to users through phones devices and smart devices like Alexa speaker's also through voice recognition applications like Siri. To describe or call any technology by one name that makes our lives easier and smarter is almost impossible. There are a variety of terms that refer to agents that can perform tasks or services for an individual, and they are almost interchangeable — but not quite. They differ mainly based on how we interact with the technology, the app, or a combination of both.

## 1.2 AIMS AND OBJECTIVES OF THE WORK

Main objective of building personal assistant software (a virtual assistant) is using semantic data sources available on the web, user generated content and providing knowledge from knowledge databases. The main purpose of an intelligent virtual assistant is to answer questions that users may have. This may be done in a business environment, for example, on the business website, with a chat interface. On the mobile platform, the intelligent virtual assistant is available as a call-button operated service where a voice asks the user "What can I do for you?" and then responds to verbal input.

Virtual assistants can tremendously save you time. We spend hours in online research and then making the report in our terms of understanding. ANNY can do that for you. Provide a topic for research and continue with your tasks while ANNY does the research. Another difficult task is to remember test dates, birthdates or anniversaries. It comes with a surprise when you enter the class and realize it is class test today. Just tell ANNY in advance about your tests and she reminds you well in advance so you can prepare for the test.

One of the main advantages of voice searches is their rapidity. In fact, voice is reputed to be four times faster than a written search: whereas we can write about 40 words per minute, we are capable of speaking around 150 during the same period of time. In this respect, the ability of personal assistants to accurately recognize spoken words is a prerequisite for them to be adopted by consumers.

## 1.3 PLAN OF THE WORK

- Importing Python Modules and packages:
  We have imported certain modules from python packages like:

  - bs4
  - certify
  - ctime
  - gTTs
  - os
  - PIL import Image
  - Pillow
  - playsound
  - pyaudio
  - pyautogui
  - PyPI
  - PyPI-Browser
  - Pypiwin32
  - pyttsx3
  - random
  - Requests
  - speech recognition
  - ssl
  - subprocess
  - time
  - urllib.request
  - webbrowser
  - Wheel

- Speech to Text Conversion:
  Here we are taking speech as input and converting it into text format using a speech recognition module.

- API call:
  After that we are integrating API to process various inputs and to obtain certain results.

- Text to Speech:
  Then after it converts the text into speech as a final result.

# 2 TECHNOLOGY AND LITERATURE SURVEY

- **TECHNOLOGIES USED**
- **PYTHON**
- **LITERATURE REVIEW**

## 2.1 TECHNOLOGIES USED

### 2.1.1 Python

It is an all-around valuable programming language used in our desktop assistant "ANNY". It is used as a base for the most prominent based programming in light of its versatility, straightforwardness and longstanding reputation. Python is an interpreter, high-level, general-purpose programming language. Here we have used python for both front end and as well as for backend purposes.

[Fig 1: Selecting various applications]

## 2.2 BRIEF LITERATURE REVIEW

- A speech recognizer takes an audio stream as input and thus turns it into text transcription. The voice is a signal of infinite information.

- A direct analysis and synthesizing the complex voice signal are due to too much information contained in the signal. In this project we use speech recognition module of python package.

- Our aim to create more and more functionalities which can help human to assist in their daily life and also reduces their efforts. Design of a compact large vocabulary speech recognition system that can run efficiently on any laptop devices, accurately and with low latency.

- 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 laptop devices.

# 3 SYSTEM REQUIREMENTS STUDY

---

- **USER CHARACTERISTICS**
- **HARDWARE AND SOFTWARE REQUIREMENTS**
- **FEASIBILITY STUDY**
- **ASSUMPTIONS AND DEPENDENCIES**

## 3.1 USER CHARACTERISTICS

Analyzing user characteristics is an important aspect of any project. It allows us to clearly define and focus on who the end users are for the project. Also, it allows us to check the progress of the project to ensure that we are still developing the system for the end users.

- The end user for system is:
  The main hero here is basically the farmer, as he is the one who had such type of need for crop rotation and can get the desired output from this system.

## 3.2 HARDWARE AND SOFTWARE REQUIREMENTS

The software is designed to be light-weighted so that it doesn't be a burden on the machine running it. This system is being build keeping in mind the generally available hardware and software compatibility. Software and Hardware Requirements are used to describe the minimum hardware and software requirements to run the Software. These requirements are described below:

- Hardware Requirements:

  - Pentium-pro processor or later
  - Wi-Fi Module
  - PC / Laptop with RAM 512MB or more

- Software Requirements:

  - Windows 7(32-bit) or above
  - Python: Visual Studio/ Sublime
  - Python IDLE (3.9 or later)
  - Creating Diagrams: Draw.io
  - UI-PyQt5 designer package

## 3.3 FEASIBILITY STUDY

Feasibility study can help you determine whether or not you should proceed with your project. It is essential to evaluate cost and benefit. It is essential to evaluate cost and benefit of the proposed system. Five types of feasibility study are taken into consideration.

1. **Technical feasibility:** It includes finding out technologies for the project, both hardware and software. For virtual assistant, user must have microphone to convey their message and a speaker to listen when system speaks. These are very cheap now a days and everyone generally possess them. Besides, system needs internet connection. While using ANNY, make sure you have a steady internet connection. It is also not an issue in this era where almost every home or office has Wi-Fi.

2. **Operational feasibility:** It is the ease and simplicity of operation of proposed system. System does not require any special skill set for users to operate it. In fact, it is designed to be used by almost everyone. Kids who still don't know to write can read out problems for system and get answers.

3. **Economic feasibility:** Here, we find the total cost and benefit of the proposed system over current system. For this project, the main cost is documentation cost. User also would have to pay for microphone and speakers. Again, they are cheap and available. As far as maintenance is concerned, ANNY won't cost too much.

4. **Organizational feasibility:** This shows the management and organizational structure of the project. This project is not built by a team. The management tasks are all to be carried out by a single person. That won't create any management issues and will increase the feasibility of the project.

5. **Cultural feasibility:** It deals with compatibility of the project with cultural environment. Virtual assistant is built in accordance with the general culture. The project is named ANNY so as to represent Indian culture without undermining local beliefs.

This project is technically feasible with no external hardware requirements. Also, it is simple in operation and does not cost training or repairs. Overall feasibility study of the project reveals that the goals of the proposed system are achievable. Decision is taken to proceed with the project.

## 3.4 ASSUMPTIONS AND DEPENDENCIES

### 3.4.1 Assumptions

A number of factors that may affect the requirements specified in this application include:

- The workability of the system modules such as those dealing with process migration with the scheduling policies provided by the application is assumed.

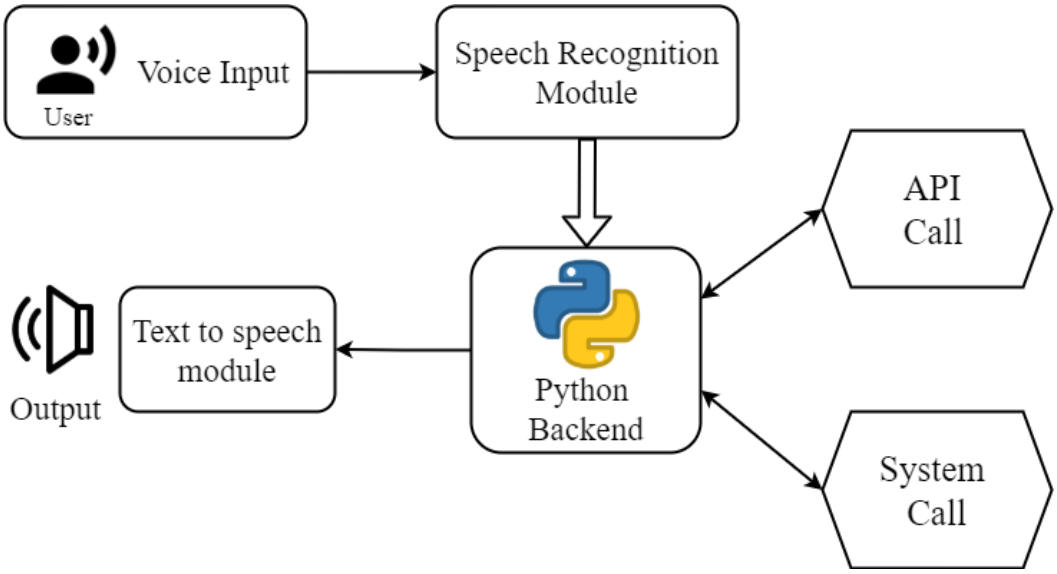
### 3.4.2 Dependencies

- System is dependent upon user speech input. If user inputs wrong function which is not yet supported by the assistant, then it will not function properly.
- This system depends on the accuracy of the data collected from the user input. Also, it depends on the accurate gathering of the input from the user by the assistant for proper results.

# 4 SYSTEM DIAGRAM

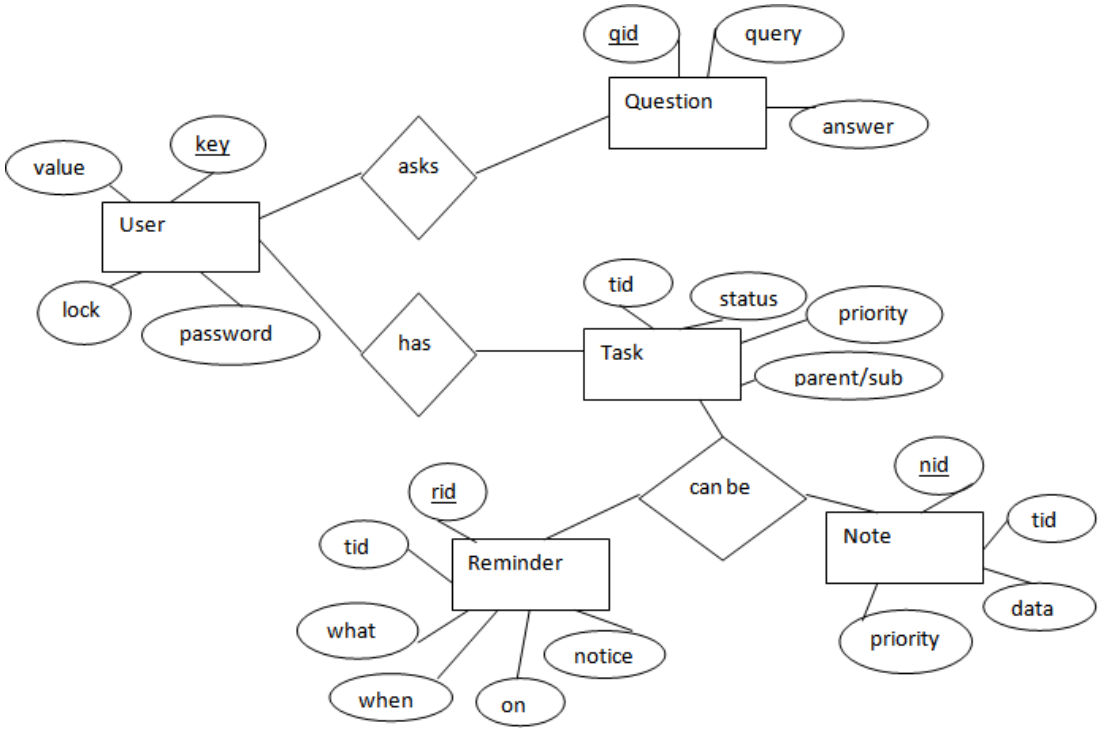
The overall system design consists of following phases:
(a) Data collection in the form of speech.
(b) Voice analysis and conversion to text
(c) Execute Python script
(d) Generating speech from the processed text output

In the first phase, the data is collected in the form of speech and stored as an input for the next phase for processing. In the second phase, the input voice is continuously processed and converted to text using speech recognition. In next phase the converted text is analysed and processed using Python Script to identify the response to be taken against the command. Finally, once the response is identified, output is generated from simple text to speech conversion.




[Fig 2: System Diagram]

## 4.2 ER DIAGRAM

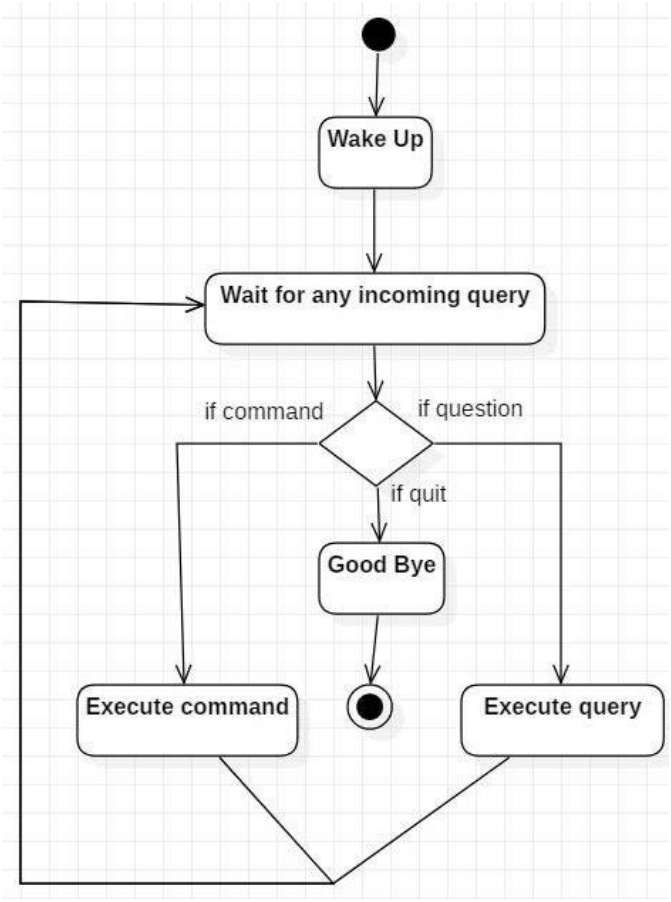



[Fig 3: E-R Diagram]

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.

## 4.3 ACTIVITY DIAGRAM

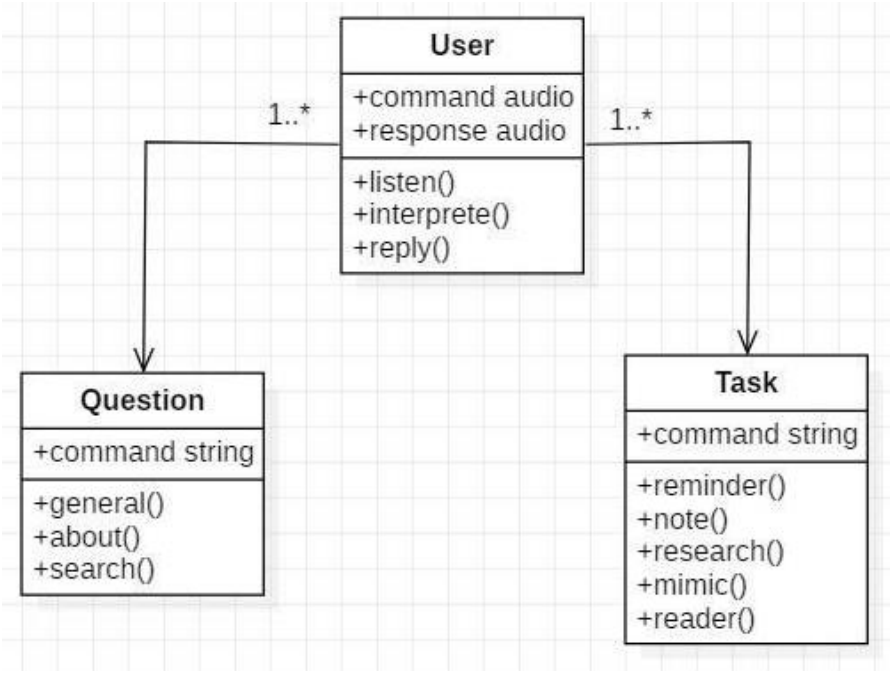



[Fig 4: Activity Diagram]

Initially, the system is in idle mode. As it receives any wakeup call 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 and at that moment, it goes back to sleep.

## 4.4 CLASS DIAGRAM

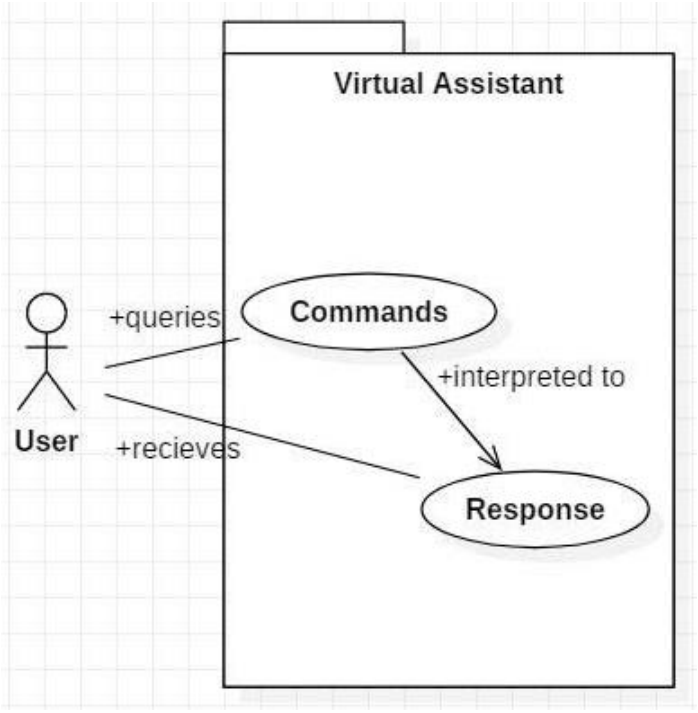



[Fig 5: Class Diagram]

The class user has 2 attributes command that it sends in audio and the response it receives which is also audio. It performs function to listen the user command. Interpret it and then reply or sends back response accordingly. Question class has the command in string form as it is interpreted by interpret class. It sends it to general or about or search function based on its identification.

The task class also has interpreted command in string format. It has various functions like reminder, note, mimic, research and reader.

## 4.5 USE CASE DIAGRAM

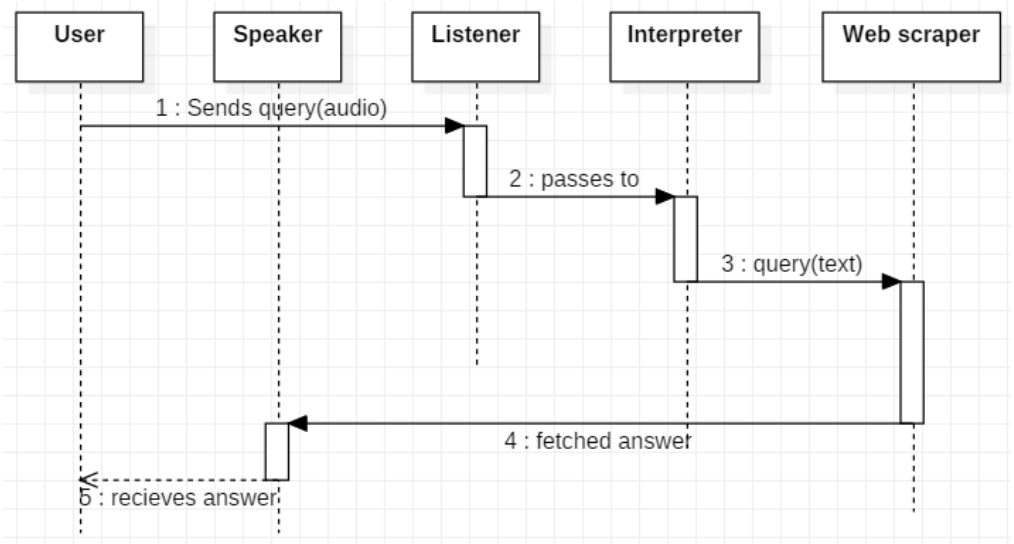



[Fig 6: Use-case Diagram]

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.

## 4.6 SEQUENCE DIAGRAM

### 4.6.1 Sequence diagram for Query-Response

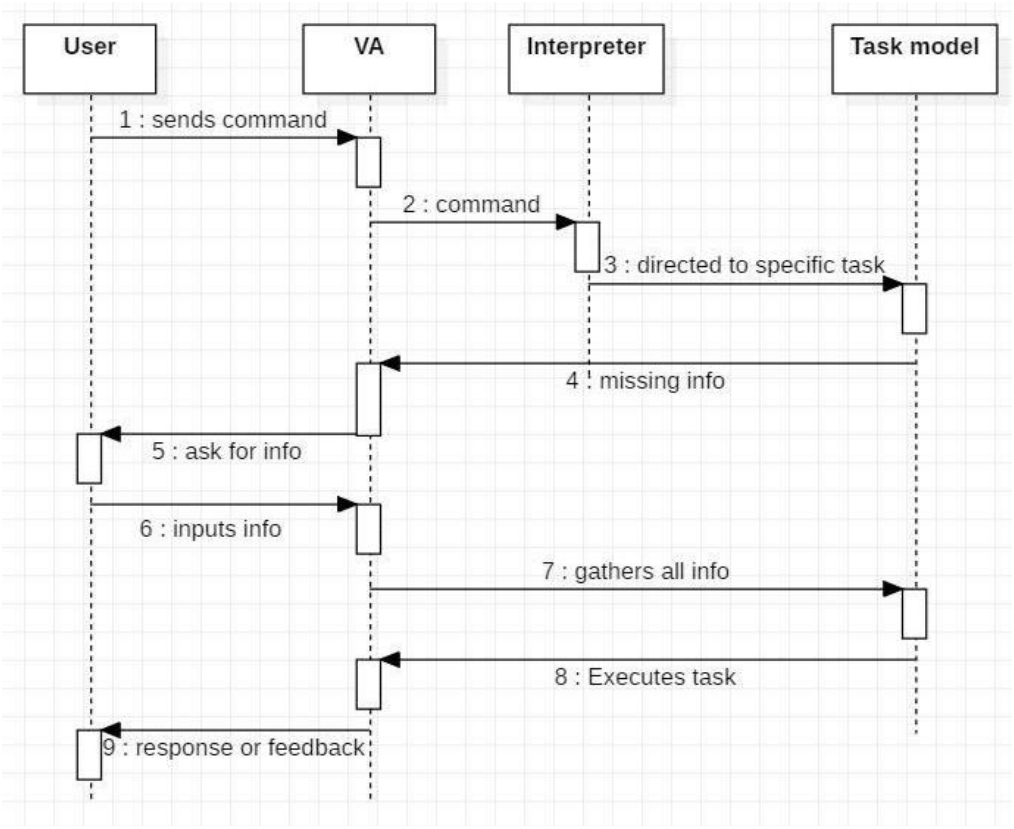



[Fig 7: Sequence Diagram for Q-R]

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.

### 4.6.2 Sequence diagram for Task Execution



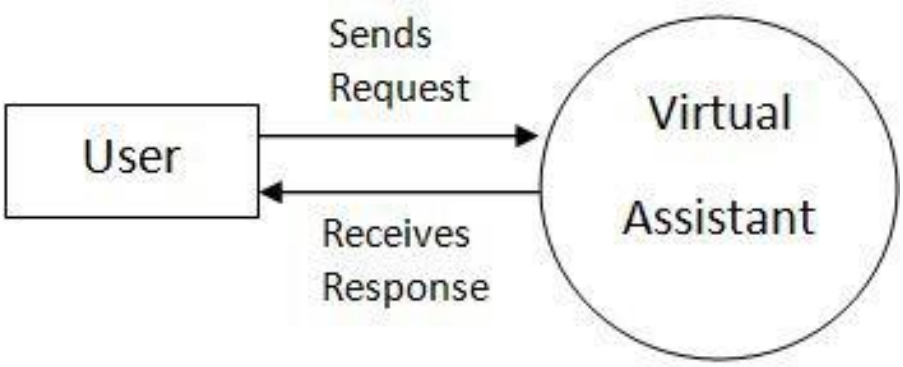

[Fig 8: Sequence Diagram for Task Execution]

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.

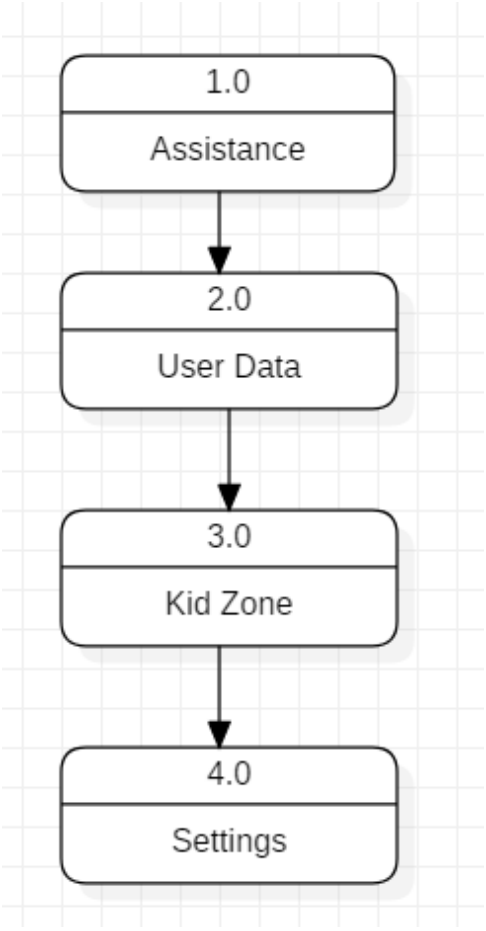
## 4.7 DATA FLOW DIAGRAM

### 4.7.1 DFD Level 0 (Context Level Diagram)



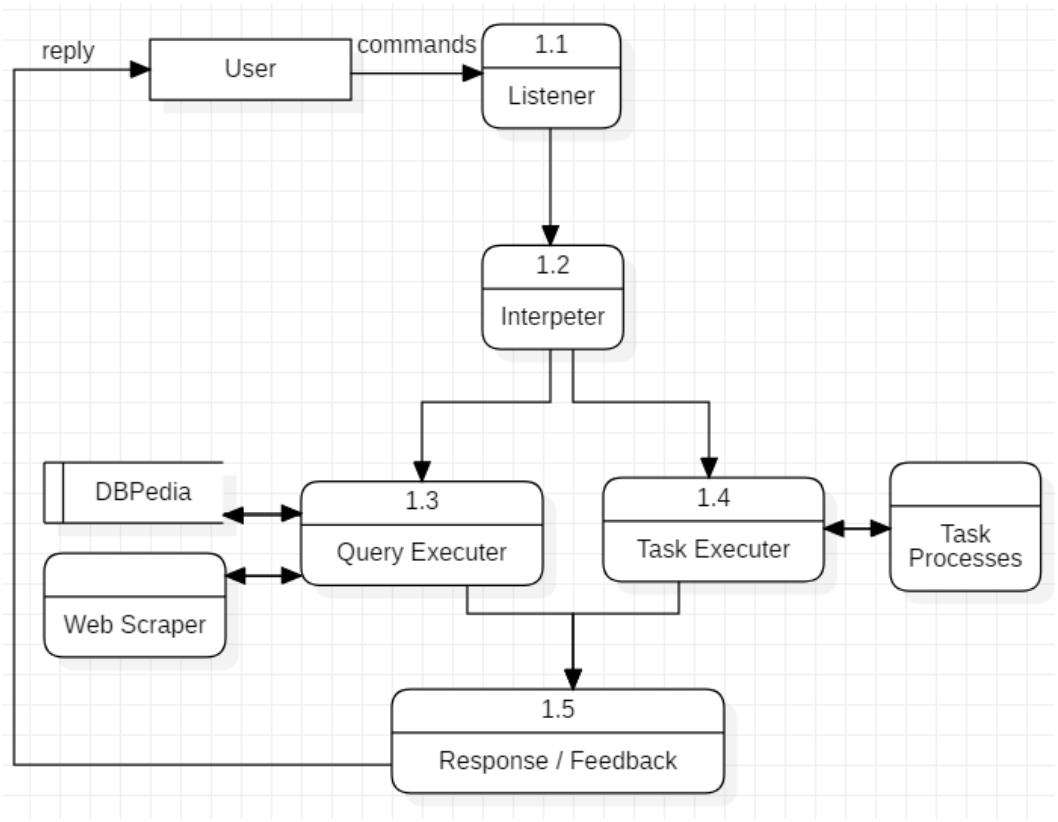

[Fig 9: DFD Level-0]

### 4.7.2 DFD Level 1

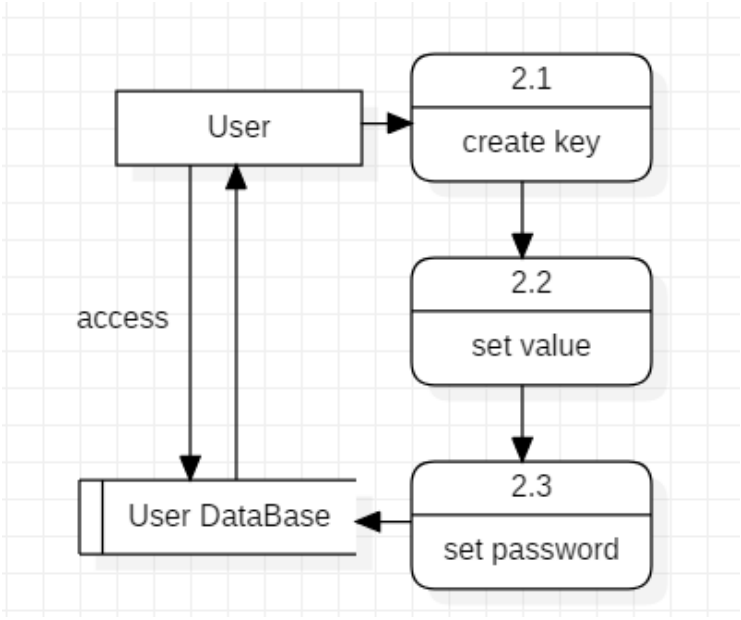



[Fig 10: DFD Level-1]

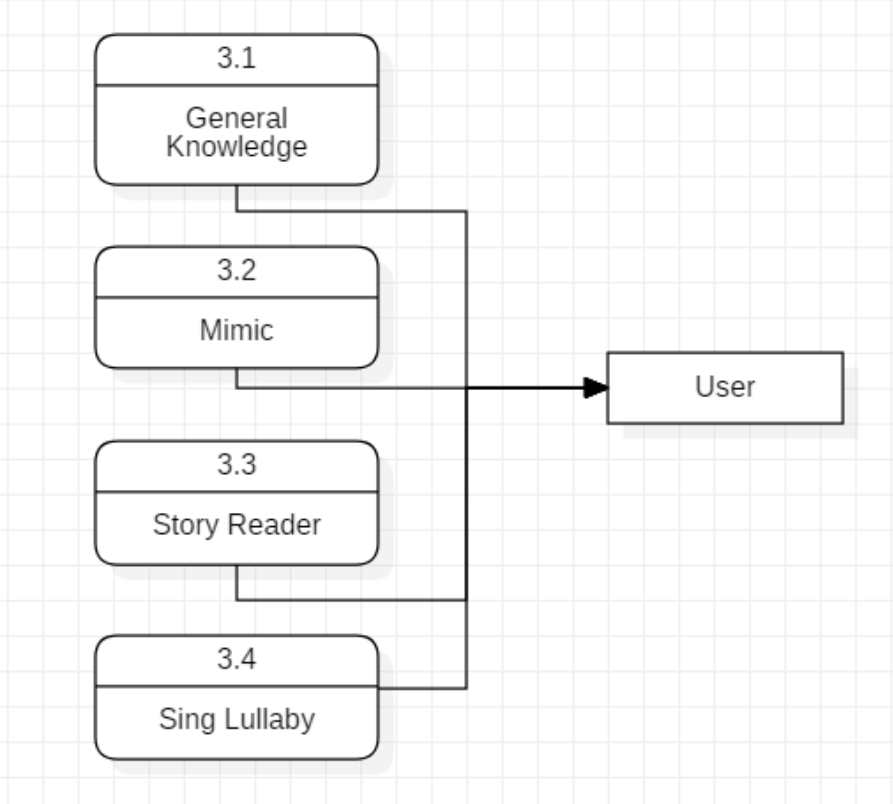
### 4.7.3 DFD Level 2



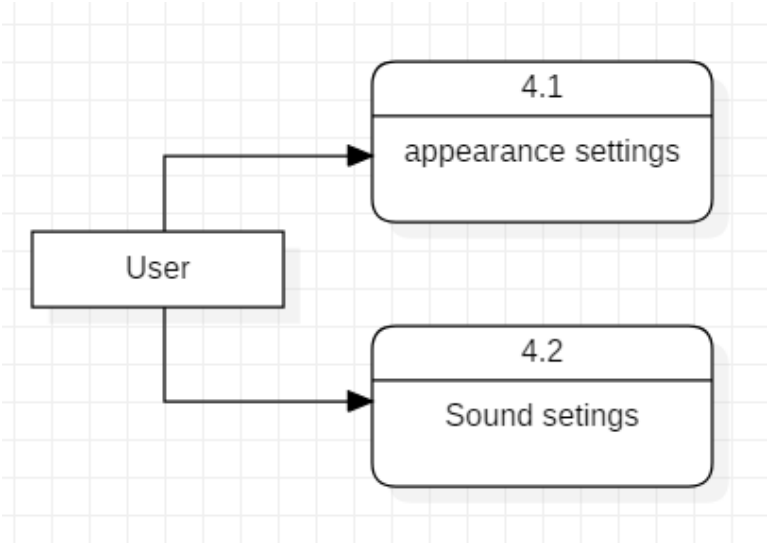

[Fig 11: Data Flow in Assistance]




[Fig 12: DFD for Managing User Data]

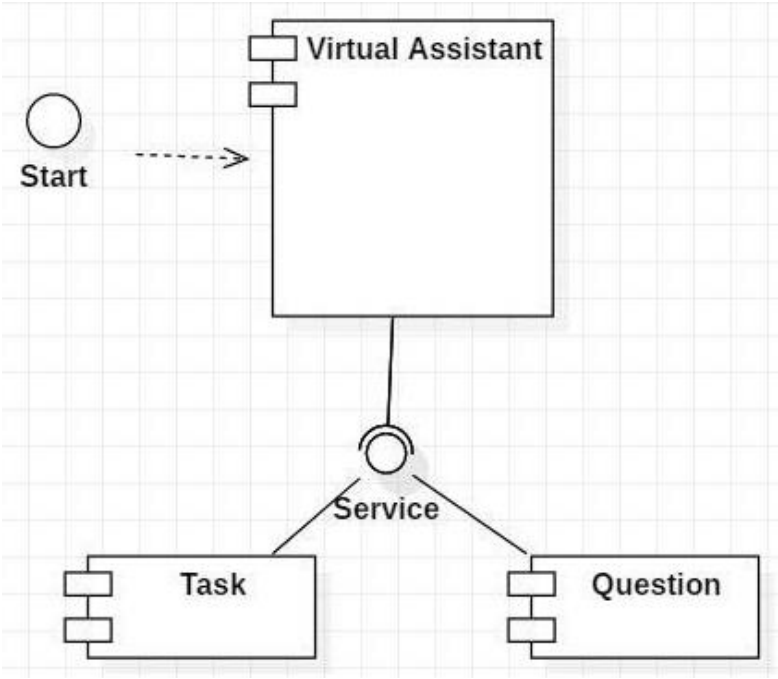



[Fig 13: Data Flow in Kid Zone]




[Fig 14: Settings of Virtual Assistant]

## 4.8 COMPONENT DIAGRAM



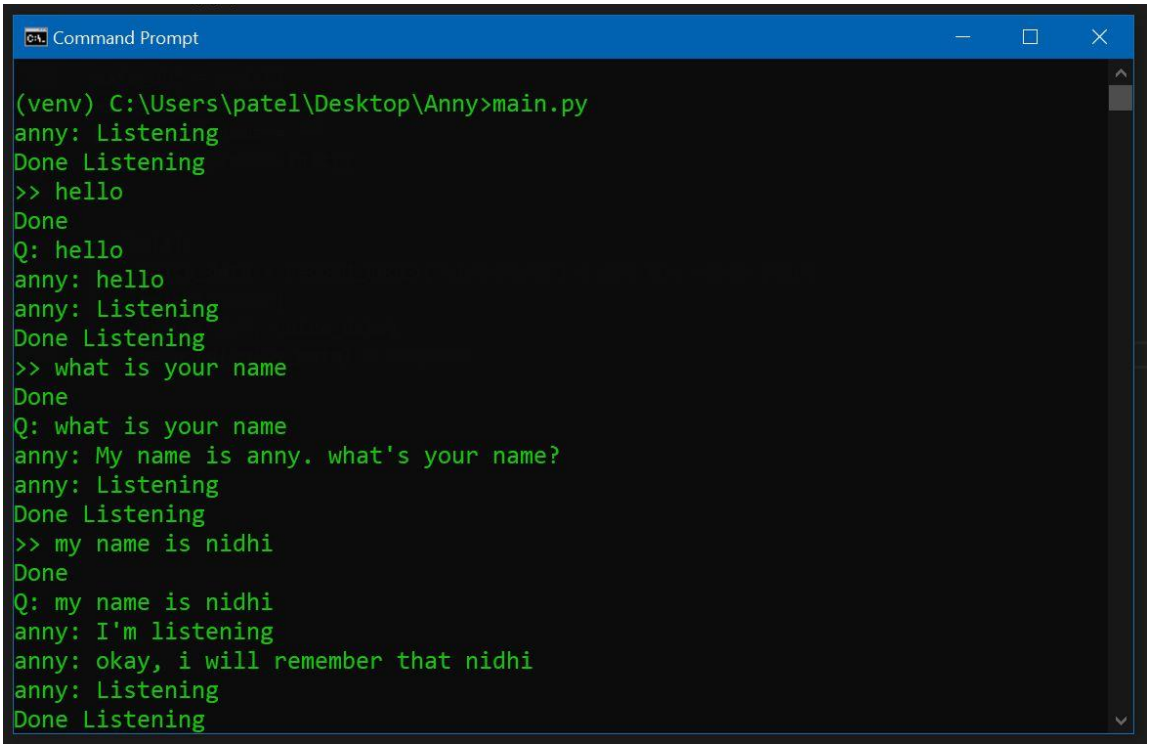

[Fig 15: Component Diagram]

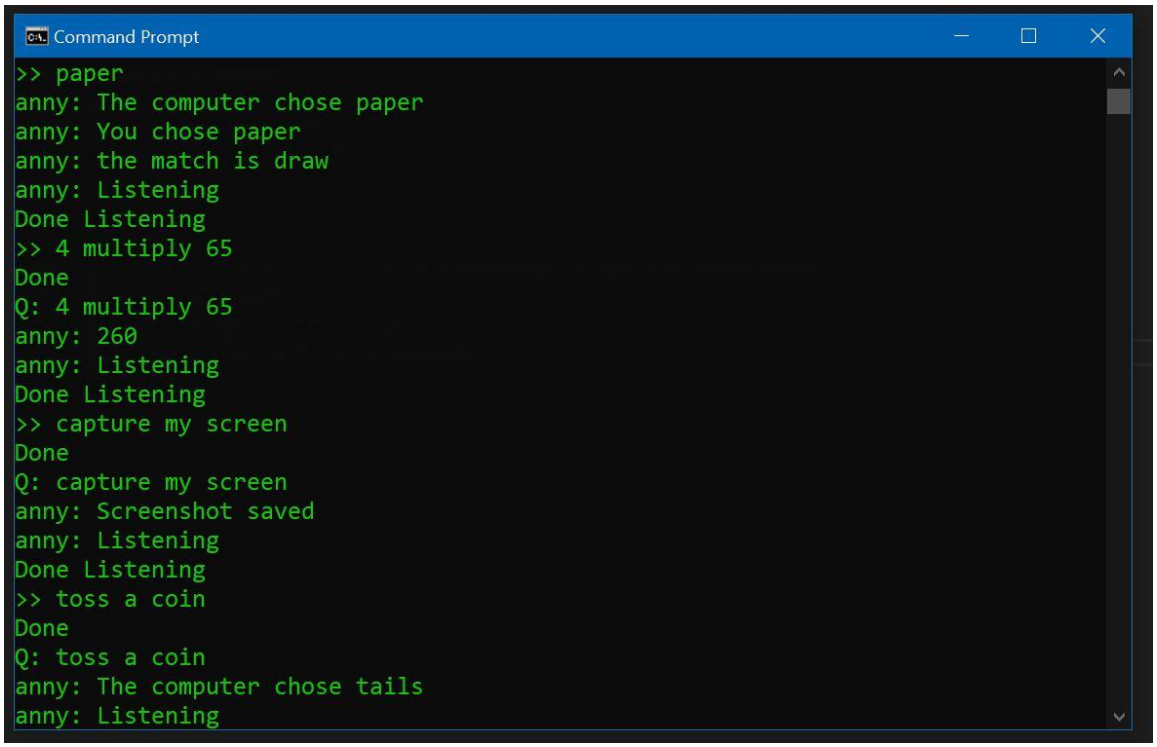
The main component here is the Virtual Assistant. It provides two specific service, executing Task or Answering your question.

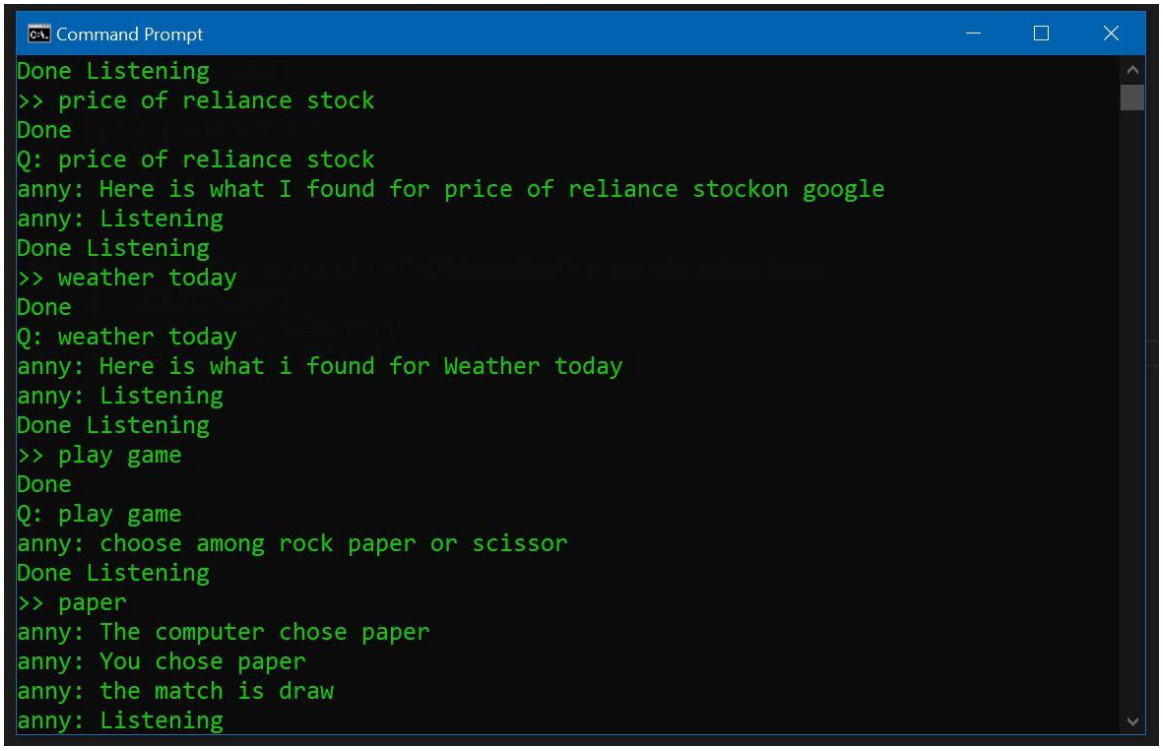
# 5 RESULT, DISCUSSION AND CONCLUSION

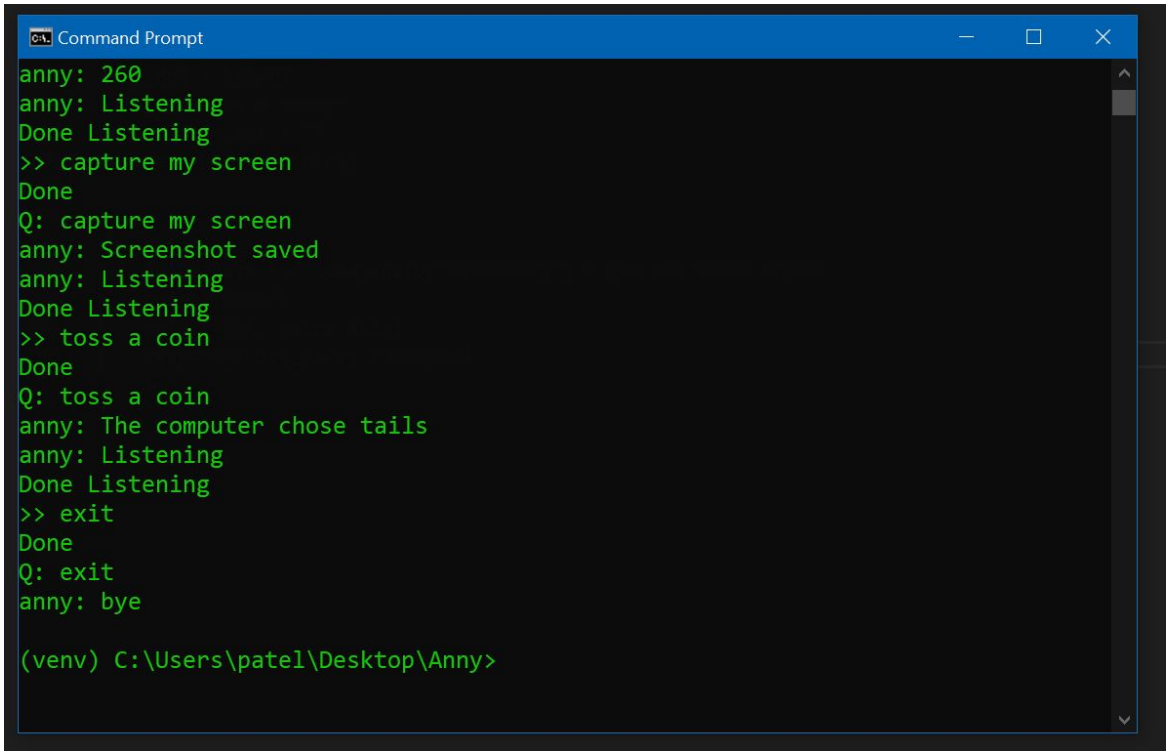
- **RESULTS AND DISCUSSION**
- **CONCLUSION**

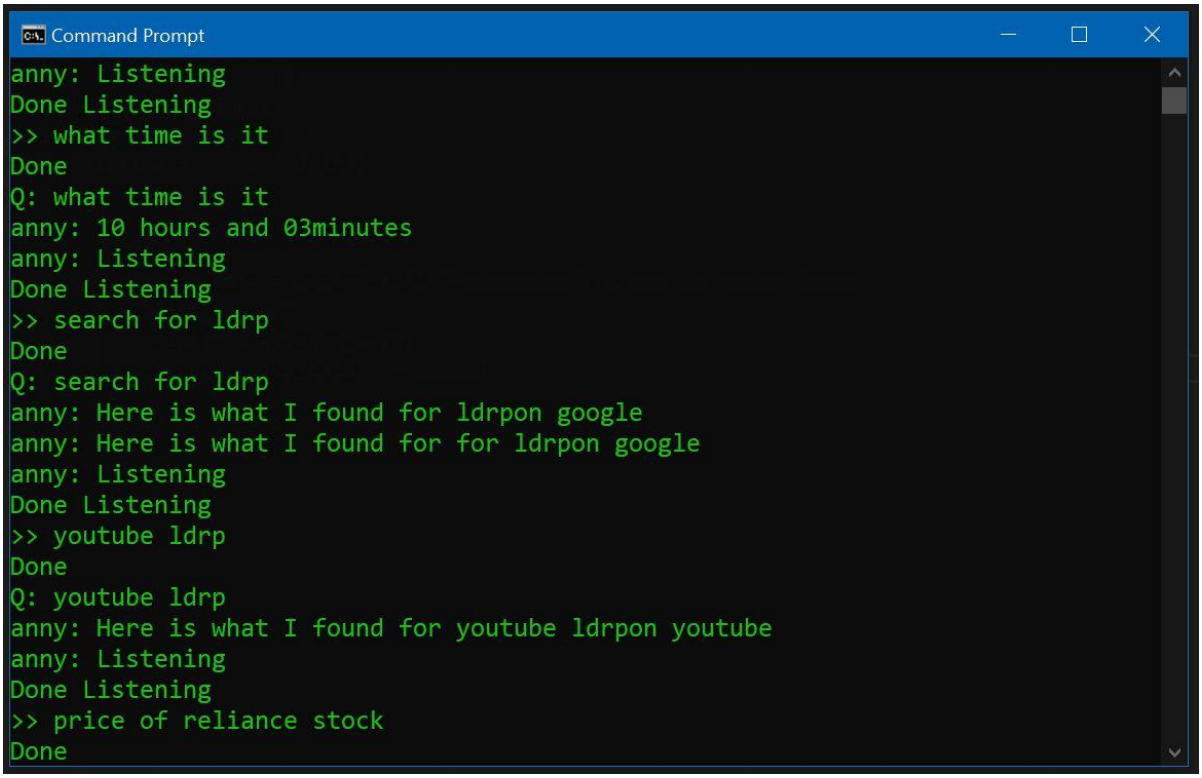
## 5.1 RESULTS AND DISCUSSION




Command Prompt
Done Listening
>> price of reliance stock
Done
Q: price of reliance stock
anny: Here is what I found for price of reliance stockon google
anny: Listening
Done Listening
>> weather today
Done
Q: weather today
anny: Here is what i found for Weather today
anny: Listening
Done Listening
>> play game
Done
Q: play game
anny: choose among rock paper or scissor
Done Listening
>> paper
anny: The computer chose paper
anny: You chose paper
anny: the match is draw
anny: Listening


Command Prompt
anny: 260
anny: Listening
Done Listening
>> capture my screen
Done
Q: capture my screen
anny: Screenshot saved
anny: Listening
Done Listening
>> toss a coin
Done
Q: toss a coin
anny: The computer chose tails
anny: Listening
Done Listening
>> exit
Done
Q: exit
anny: bye
(venv) C:\Users\patel\Desktop\Anny>


Command Prompt
anny: Listening
Done Listening
>> what time is it
Done
Q: what time is it
anny: 10 hours and 03minutes
anny: Listening
Done Listening
>> search for ldrp
Done
Q: search for ldrp
anny: Here is what I found for ldrpon google
anny: Here is what I found for for ldrpon google
anny: Listening
Done Listening
>> youtube ldrp
Done
Q: youtube ldrp
anny: Here is what I found for youtube ldrpon youtube
anny: Listening
Done Listening
>> price of reliance stock
Done

## 5.2 CONCLUSION

- The personal voice assistant system presented is a very fundamental system with few features however the additional and advanced feature may be introduced as future work of this project.
- Here the design and implementation of an Intelligent Personal Voice Assistant for Desktop is described.
- The project is built using available open Python modules with visual studio code community backing, which can accommodate any updates in future. The modular approach used in this project makes it more flexible and easier to integrate additional modules and features without disturbing the current system functionaries.
- It not only works on human commands but also it is designed for give responses to the user on the basis of a query being asked or the words spoken by the user such as opening tasks and operations.

# 6 REFERENCES AND BIBLIOGRAPHY


- Websites referred:
  - www.stackoverflow.com
  - www.pythonprogramming.net
  - www.codecademy.com
  - www.tutorialspoint.com
  - www.google.co.in

- Books referred:
  - Python Programming - Kiran Gurbani
  - Learning Python - Mark Lutz

- YouTube Channels referred:
  - CS Dojo
  - edureka!

- Documents referred:
  - Designing Personal Assistant Software for Task Management using Semantic Web Technologies and Knowledge Databases [Purushotham Botla]
  - Python code for Artificial Intelligence: Foundations of Computational Agents [David L. Poole and Alan K. Mackworth]