Personal Assistant

(F.R.I.D.A.Y.)

INT213-Python Programming

Session: 2020-21

Submitted to: **Submitted By**:

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INTRODUCTION

Technology has evolved expeditiously in the past couple of decades. Our day to day tools, such as a telephone, calculator, radio, phonebook, and many such items, are all integrated into one thing, that is a smartphone. These innovations took place for reducing human efforts and making them more efficient. Nowadays, a new technology knows as a virtual assistant is present in everyone's pocket.

This project is equivalent to existing technologies in many cases, but it provides some extra features for power users. The project is made using python programming language and various libraries such as Tkinter, text to speech, Speech Recognition, and OpenCV, which are parts of the same. The assistant can perform multiple tasks such as mathematical calculations, playing a YouTube video, sending emails, reading the news, and much more.

The description of the modules used in the project is as follows:

- **Tkinter:**

  Python has a lot of GUI frameworks, but Tkinter is the only framework that's built into the Python standard library. Tkinter has several strengths. It's cross-platform, so the same code works on Windows, macOS, and Linux. Visual elements are rendered using native operating system elements, so applications built with Tkinter look like they belong on the platform where they're run. In this project, Tkinter plays a major role as the user needs an easy to use UI. Tkinter provides various widgets such as labels, frames, Canvas, Buttons, Checkboxes, Radio buttons, and many more.

- **Text to Speech:**

  Pyttsx3 is a text to speech conversion library in Python. It works offline and is compatible with both Python 2 and 3. It is a very easy to use tool which converts the entered text into speech. The pyttsx3 module supports two voices first is female and the second is male. In this project, text to speech is used when the assistant replies to the user's queries.

- **Speech Recognition:**

  The Speech Recognition library acts as a wrapper for several popular speech APIs and is thus extremely flexible. One of these—the Google Web Speech API—supports a default API key that is hard-coded into the Speech Recognition library. That means we can use it without having to sign up for the service. In this project, Speech Recognition is used when the user speaks to the assistant and the speech is converted into text and is passed in the program as a string.

- **OpenCV:**

  It uses machine learning algorithms to search for faces within a picture. Because faces are so complicated, there isn't one simple test that will tell you if it found a face or not. Instead, there are thousands of small patterns and features that must be matched. The algorithms break the task of identifying the face into thousands of smaller, bite-sized tasks, each of which is easy to solve. In this

project, OpenCV is used to register face when the user executes the program for the first time. This is done for authentication purposes.

ABSTRACT

The project aims to develop a personal-assistant for computer systems. F.R.I.D.A.Y. draws its inspiration from virtual assistants like Cortana for Windows, and Assistant for Android. It has been designed to provide a user-friendly interface for carrying out a variety of tasks by implementing certain well-defined commands. Users can interact with the assistant either through voice commands or using keyboard input. As a personal assistant, F.R.I.D.A.Y. assists the end-user with day-to-day activities like a general human conversation, searching queries in Google, searching for videos on YouTube, retrieving images, live weather conditions, word meanings, and telling the user about the scheduled events and tasks. The user commands are analysed with the help of Speech Recognition to give an optimal solution.

OBJECTIVE

The main purpose of the software is to perform the tasks of the user at certain commands, provided in either of the ways, speech or text. It makes the user's day-to-day tasks smooth and enhances their productivity. F.R.I.D.A.Y. draws its inspiration from Virtual assistants like Cortana for Windows and Assistant for Android. Users can interact with the assistant either through voice commands or keyboard input. We made this project by keeping ourselves in the place of the user. The project aims to provide the users with a Virtual Assistant that would not only aid in their daily routine tasks like searching the web, extracting weather data, vocabulary help, and many others but also help in automation of various activities.

FACE SECURITY

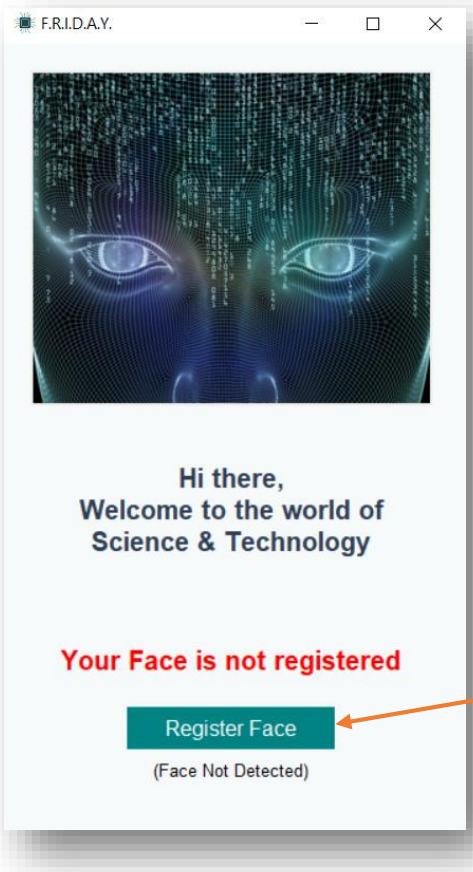


Fig. 1.1

- For Security purpose, there is a Face Unlock feature, which only allows the registered user to use this software.
- If a user is running this software for the first time, then this page will appear showing a “Register Face” button and a message that “Your Face is not registered”.

Click on this Button to register an account and to use this software.

REGISTER FACE

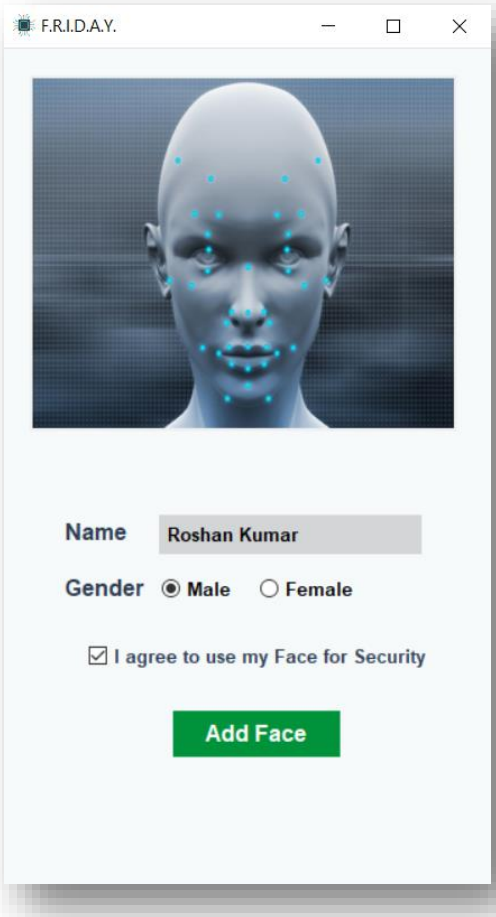


Fig. 1.2

- After clicking on Register Face Button, this page will appear.
- Here, user have to fill the basic details like Name and Gender and check on agree to use his/her face for the security purpose.
- If he/she get agreed then, Add Face button will work, else it shows a message to fill the details.

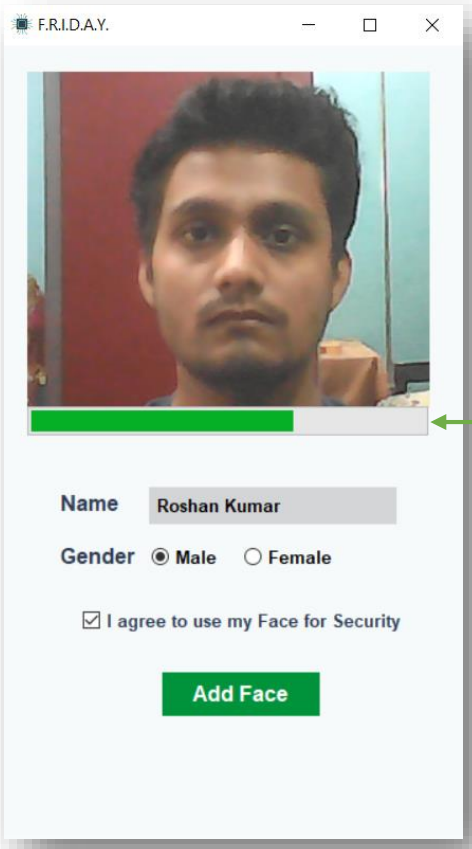


Fig. 1.3

- After clicking on Add Face button, the software will open the camera inside the same screen and starts capturing 100 images of user face.
- Progress bar will shows the real time progress of the capturing images.
- After capturing 100 images, it will train on those images, to detect the face accurately.
- When it trains completely, the Next Button will get activated which will allow user to proceed for the next steps.

CHOOSE AVATAR

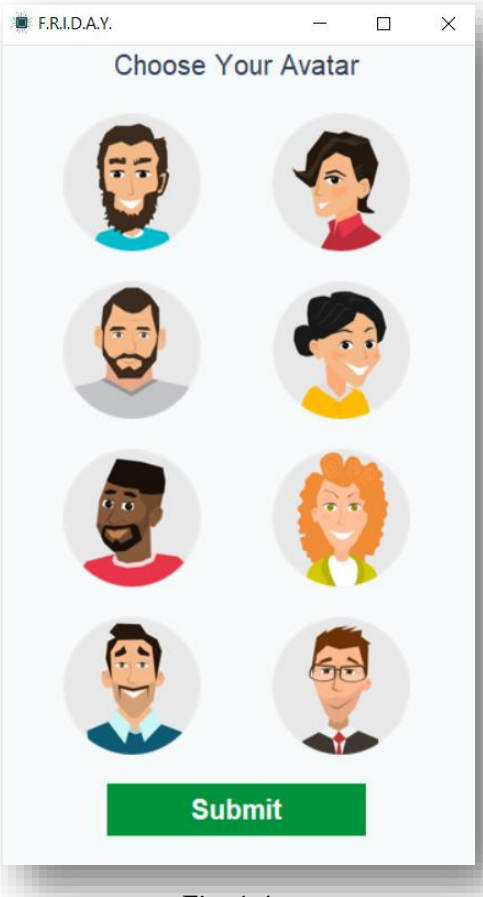


Fig. 1.4

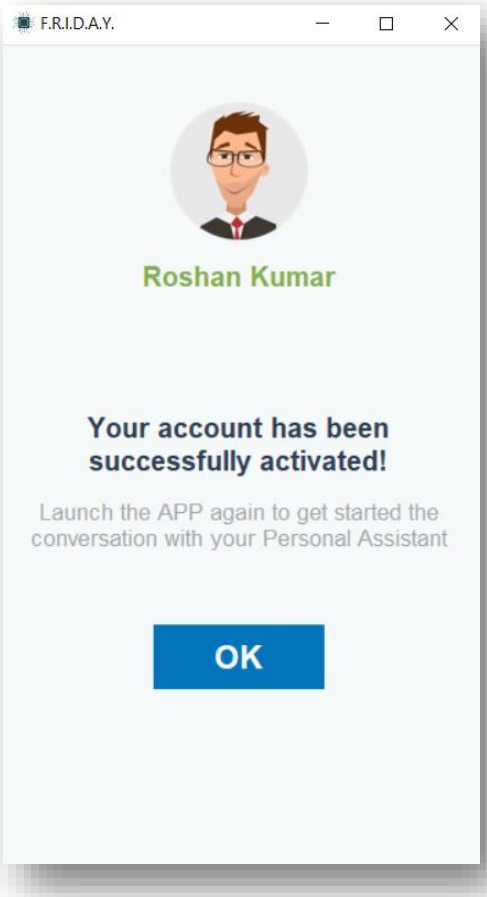


Fig. 1.5

(User can choose any of the avatars provided, and Submit button will activate his/her account)

LOGIN

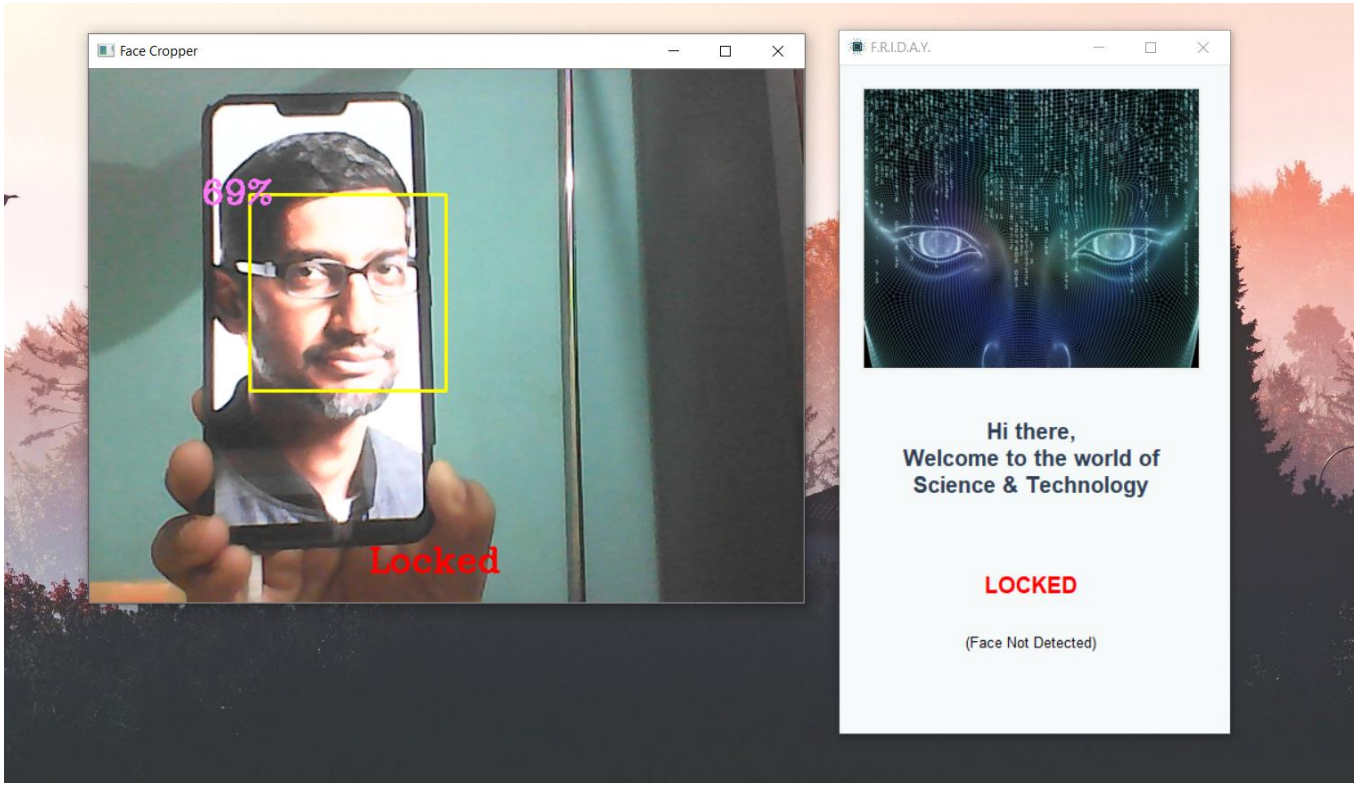


Fig. 1.6

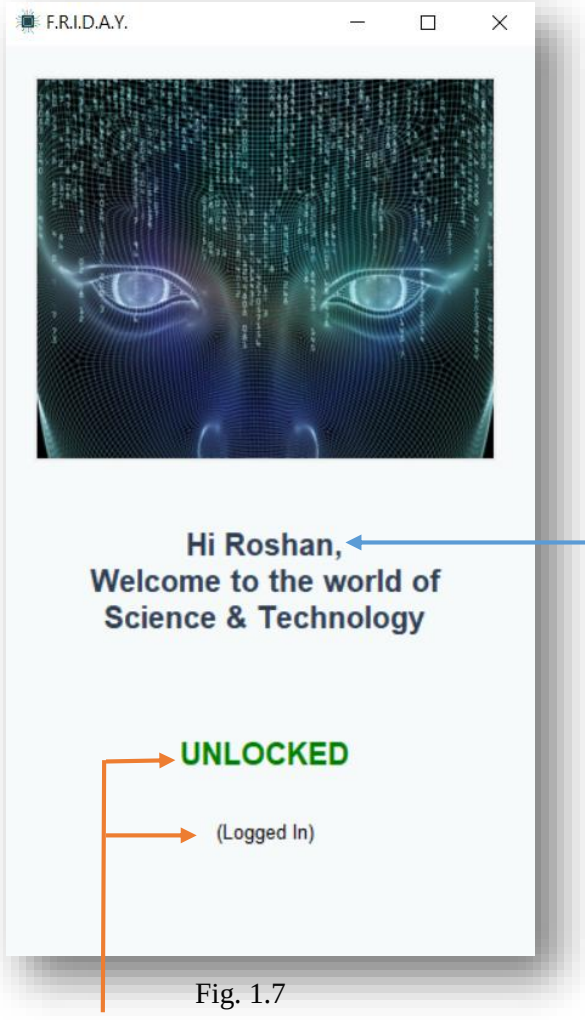


Fig. 1.7

- After Successful Registration, when the user runs the Software again, it will start detecting the face.
- If there is no face in-front of camera, it will show a message “Face Not Found”.
- If it detects the face but the detected face is not registered then, it will shows “LOCKED”.
- If it detects the registered face, it will then UNLOCKED the main Page of the software, through which the user can ask Personal Assistant to perform his/her tasks.
- It will show a welcome message with name of the user.

First Name of the Registered Account

It shows the current Login Status

LOADING SCREEN

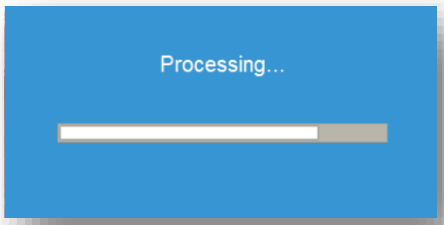


Fig. 2.1

- After Successful login, this loading screen will appear which will indicate that the software is being loaded.

HOMESCREEN

Keyboard Switcher (Used to switch between speak input and text input mode)

Chat Screen (Here the conversation between the User and Assistant will be shown, weather it is image or normal chats)

Assistant Activity Panel (It will display the current activity of the Assistant, like, Listening, Processing or Speaking)

Settings (When clicked, the settings of the Software will get displayed)

Fig. 3.1

- This is the main module of the software where user can interact with the Personal Assistant by his/her voice or text input.
- Here user can tell his/her query and the Assistant will perform the task based on the query.
- By default, the theme will be in dark mode.
- Here user can see every suitable options which can make it easier.

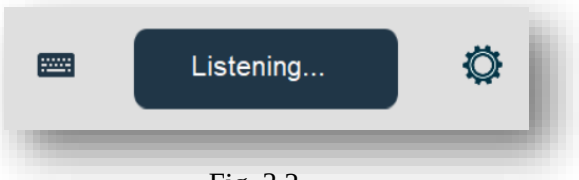


Fig. 3.2

- It means that the Assistant is currently listening to the user voice, and when the user finish his/her talk, it will stop listening automatically.

- It means that the Assistant is currently processing your voice data i.e., Speech To Text.

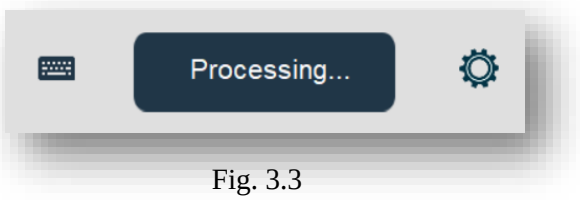


Fig. 3.3

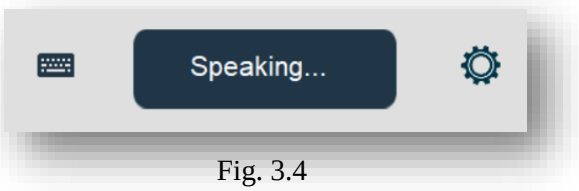


Fig. 3.4

- It means that the Assistant is replying to the user query. After speaking, it will again start listening.

- When the Keyboard button is clicked, this text box will appear through which user can start conversation by texting. Mic Button will let to go back to speak mode.

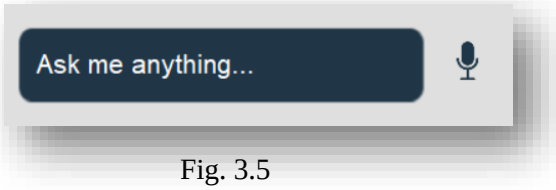
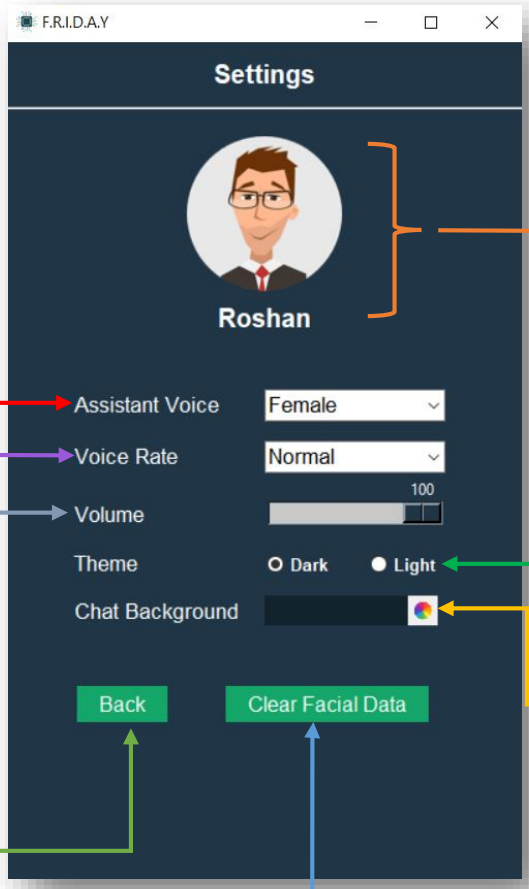


Fig. 3.5

SETTINGS



Assistant Voice (User can choose voice from Male and Female)

Voice Rate (It allows to set voice speed of Assistant)

Volume (User can adjust the volume of Assistant Voice)

It will just go back to the Home Screen

User Details (It will show the current avatar selected and the first name of the user)

Theme (There are two options to choose from Dark Mode and Light Mode for user relief)

Chat Background (A colour chooser palette will appear which allows user to change the chat background

Clear Facial Data (It deletes the user account completely, and prompt for Yes/No before deleting)

Fig. 4.1

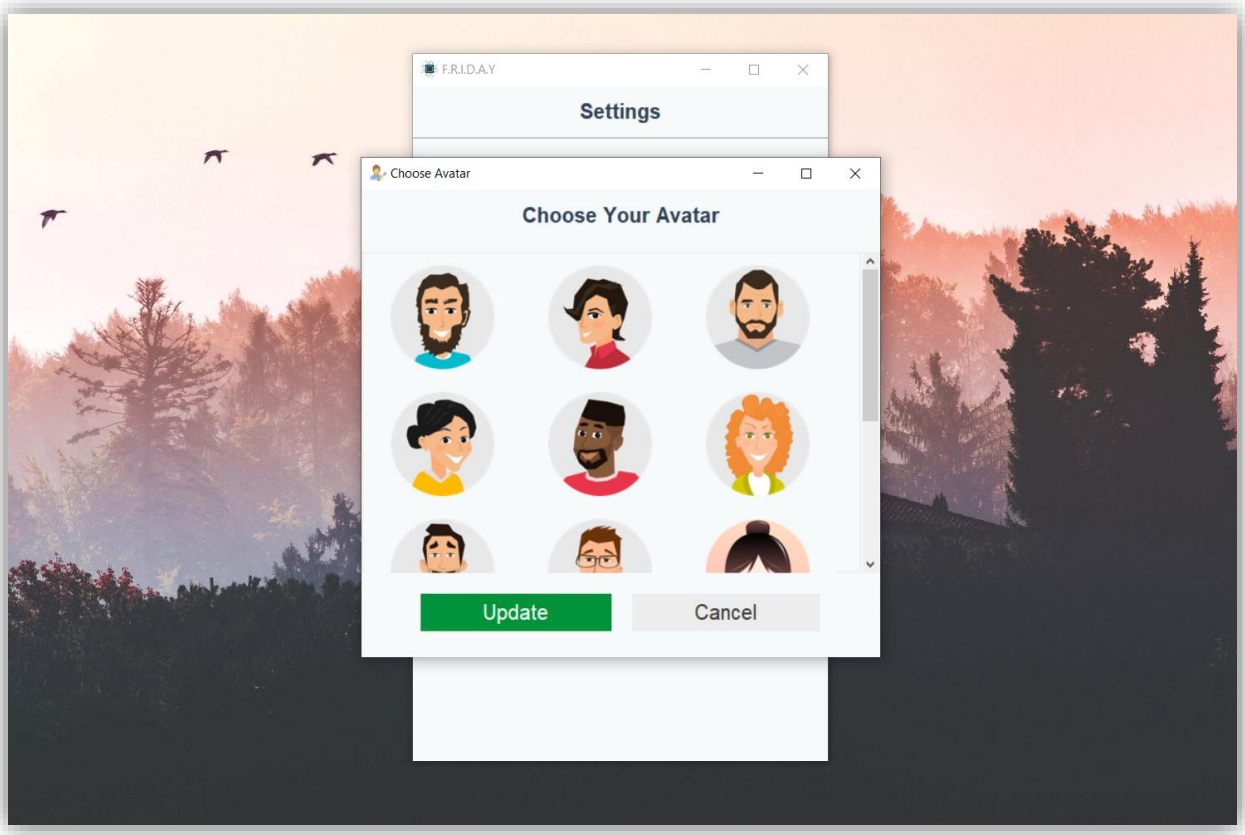


Fig. 4.2

- When the mouse is hovered over the profile pic, the update option will get visible through which the user can update the profile pic from the many avatars provided.
- The scrollbar will let the user to see more avatars which are below.
- The Update button will update the selected avatar to the user profile pic.

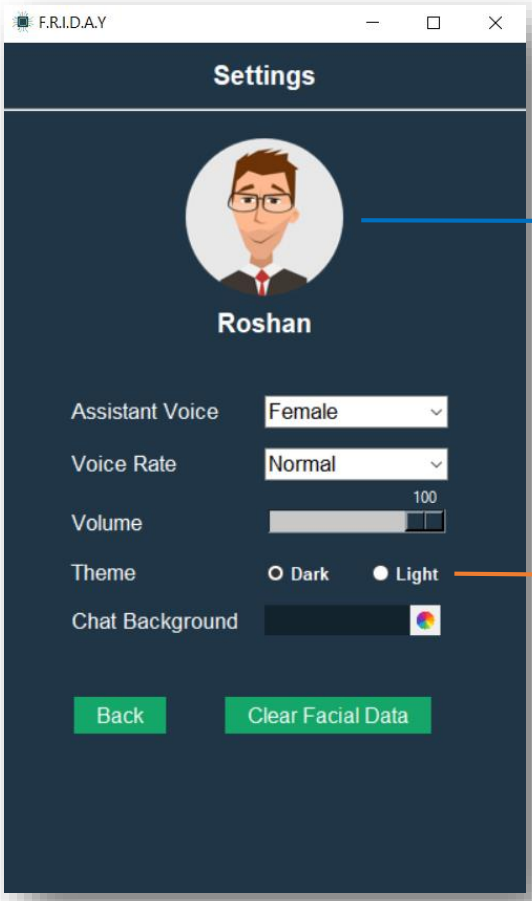


Fig. 4.3

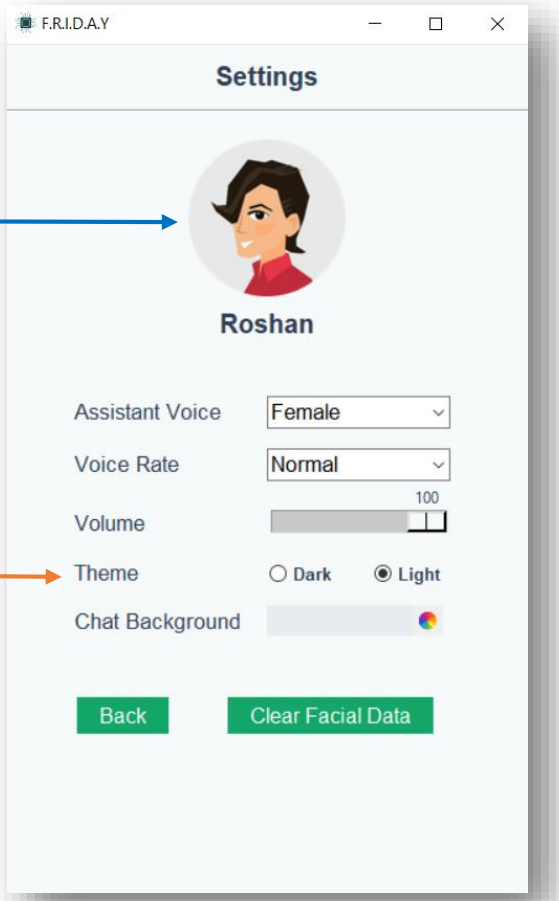


Fig. 4.4

GAME

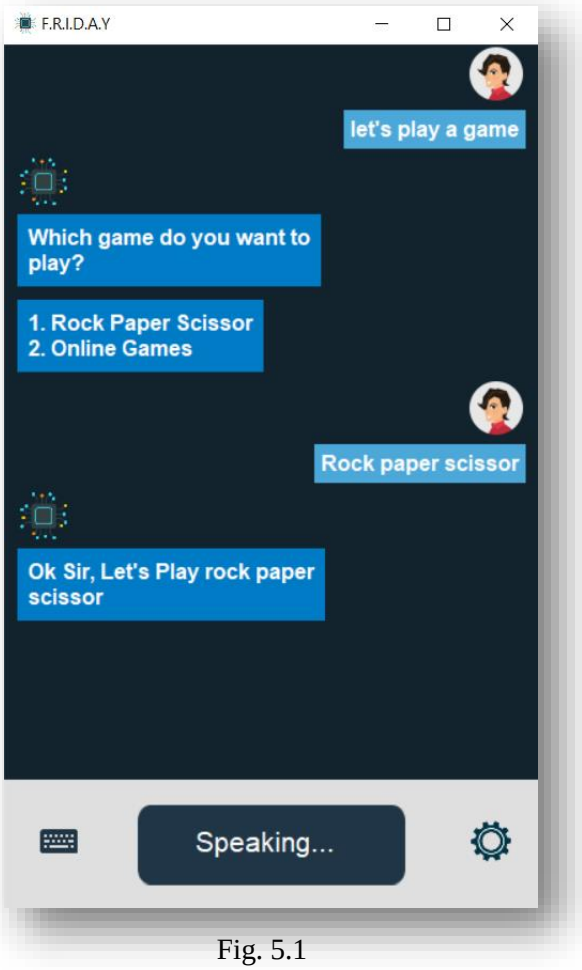


Fig. 5.1

- To Play a game, just say phrase like "Let's Play Game", "Play Game".
- It will then shows the available games with "Online Games".
- If the user wants to play online games, then Assistant will open this link: https://www.agame.com/games/mini-games/ on the browser and then the user can play games from this website.
- If he/she chooses Rock Paper Scissor, then a new game window of Rock Paper Scissor will appear.

- At time of loading, the Assistant will speak out the basic rules before the game starts.
- To play this game, user have to say move his/her like "I choose Rock" or simply "Rock", "Paper", "Scissor".
- The Score at left is of Assistant and the right one is of user.
- The one who wins the particular move, will be awarded 1 point and if draw then both will be awarded 1 point.
- To Stop the match, say phrase like "STOP the match" or "Cancel the Match" or simply "STOP".
- After that, it will shows the final result and tells Who Won or Who Lose.

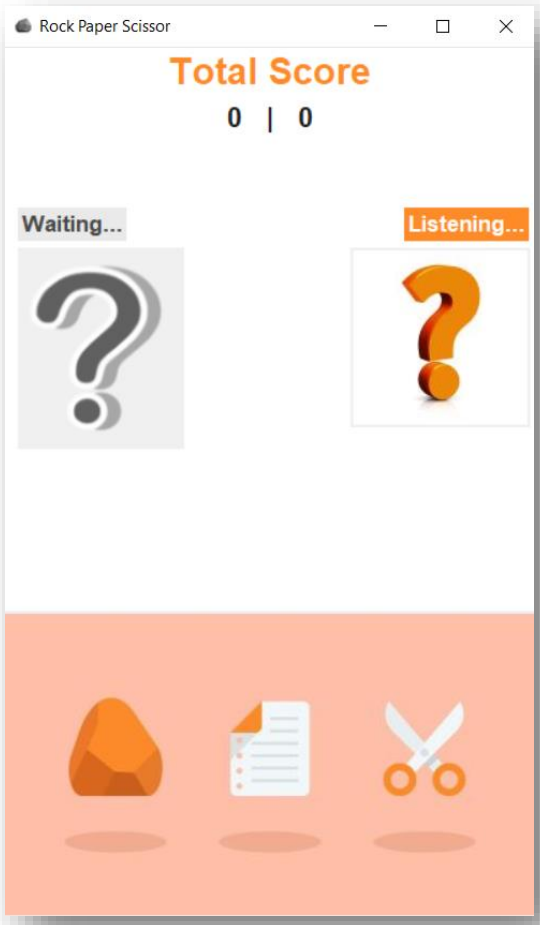


Fig. 5.2

Fig. 5.3

After Some Moves

User: I choose Rock
Bot: I choose Scissor

User: Scissor
Bot: I choose Paper

.....

.....

User: Stop the match

Total Wins / Total Matches

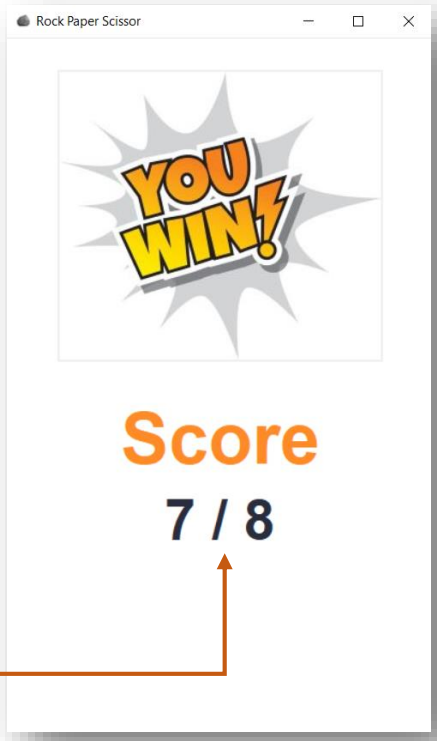


Fig. 5.4

COIN

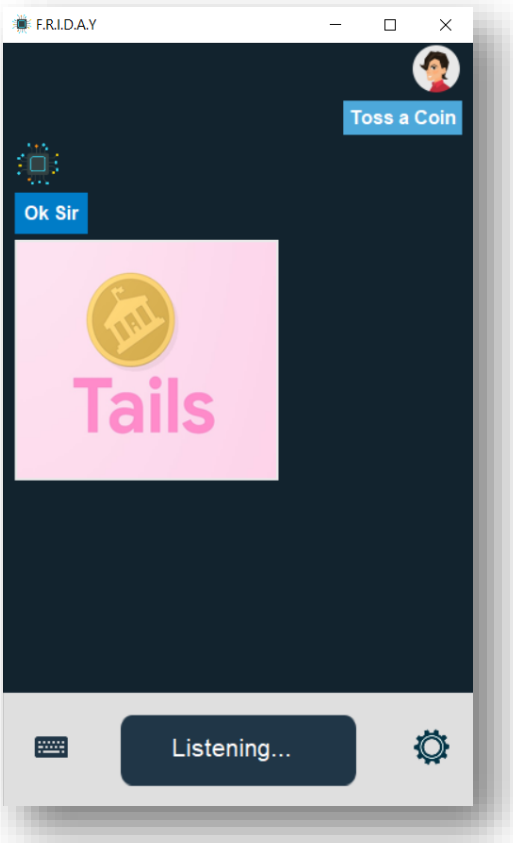


Fig. 6.1

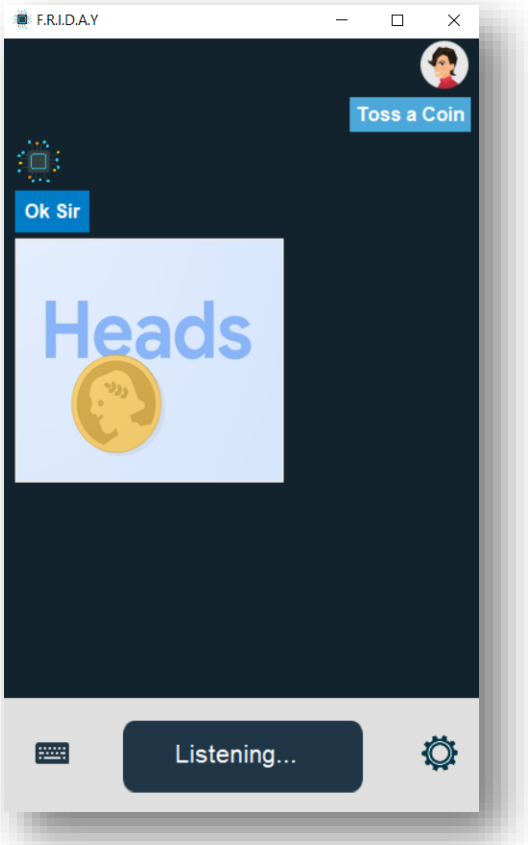


Fig. 6.2

- To use this feature, you can say “Toss a Coin”, “Flip a Coin”.
- It will plays a background sound of tossed coin, which make it more interactive.
- It will then choose a random between head and tail and speak the result like, “You got Head” or “You got Tail”.
- It then displays the particular image in chat frame.

DICE

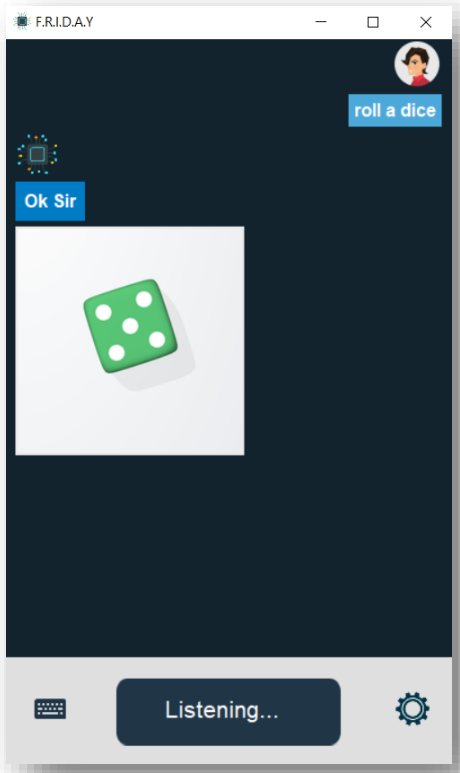


Fig. 7.1

- If we are playing LUDO or we want a random number between 1&6, then we can use this feature.
- Just say, “Roll a Dice”.
- It will play a background sound of a rolling dice to make interactive.
- It generates a random number from [1 2 3 4 5 6] and speaks out the result like, “You got 2”, “You got 6”, “You got 5”.
- It then displays that side face of dice having the same number, which makes it more attractive.

WIKIPEDIA

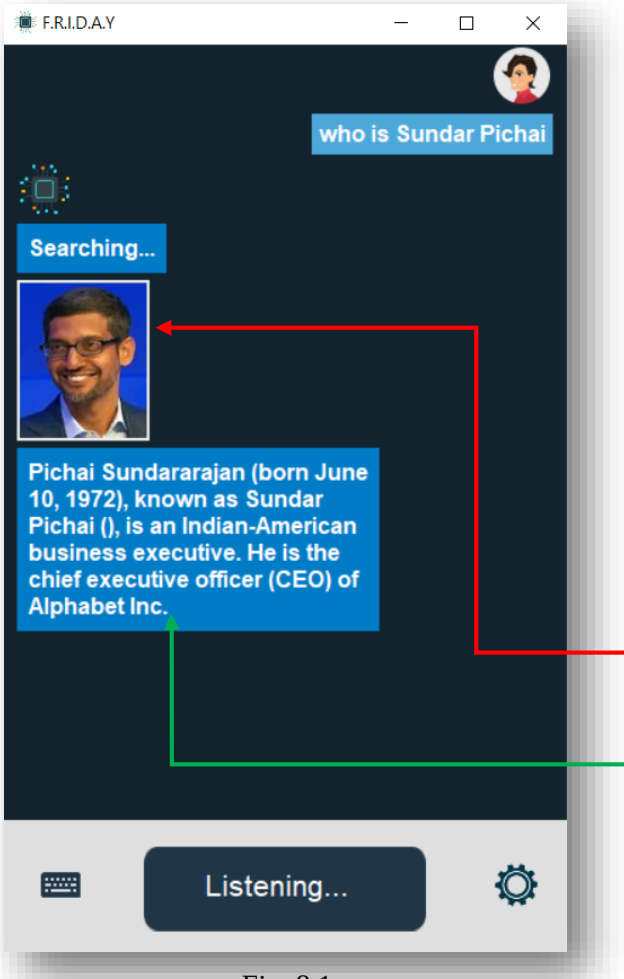


Fig. 8.1

- To know about someone or something, just say phrases like “Who is Sundar Pichai” or “Wikipedia result of Sundar Pichai” or “Sundar Pichai in Wikipedia”.
- It will search the person or thing on the Google Images and download one image at backend, and shows that result in the chat screen.
- It also finds the result in Wikipedia and shows and speaks that result.

IMAGE SEARCH

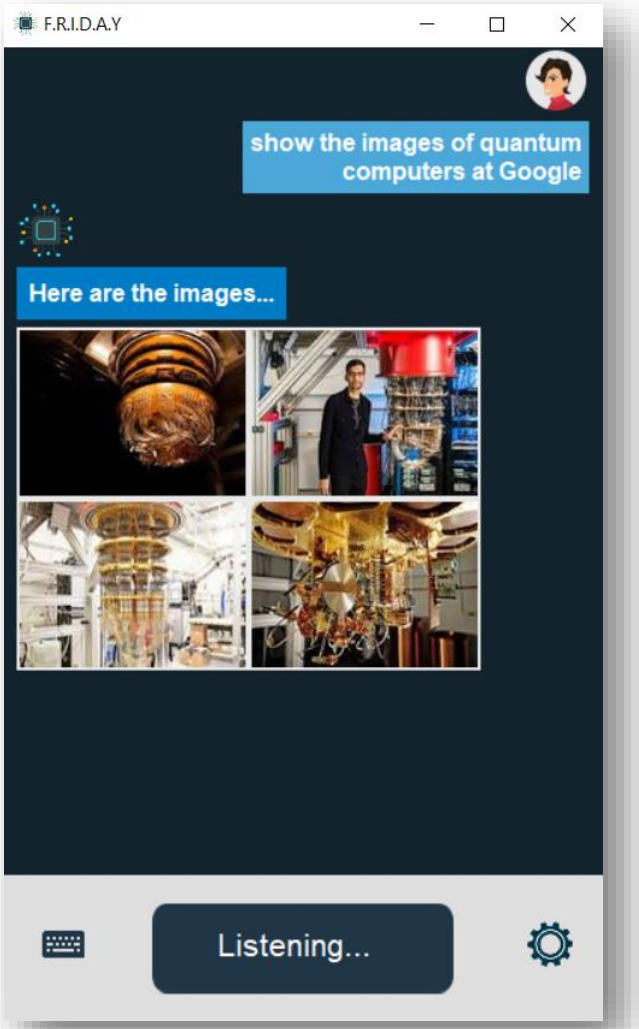


Fig. 9.1

- To search an image or want to view images, just say “Show the images of Dog”, “Images of Robot”, “Show the image of Sundar Pichai”.
- It will then generates an image search link based on the query, and downloads the first four images at backend and shows those images on chat screen.

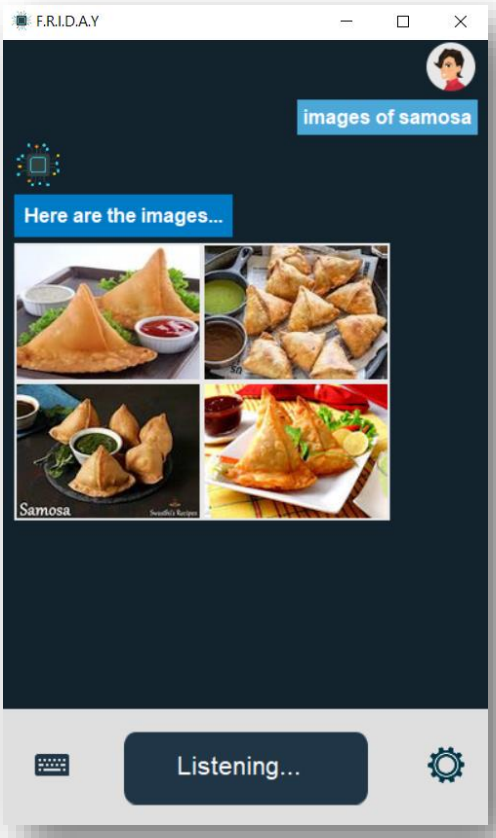


Fig. 9.2

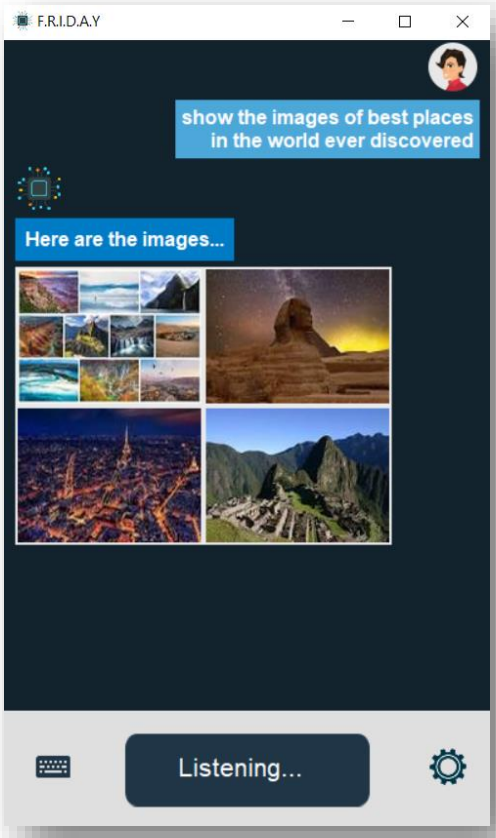


Fig. 9.3

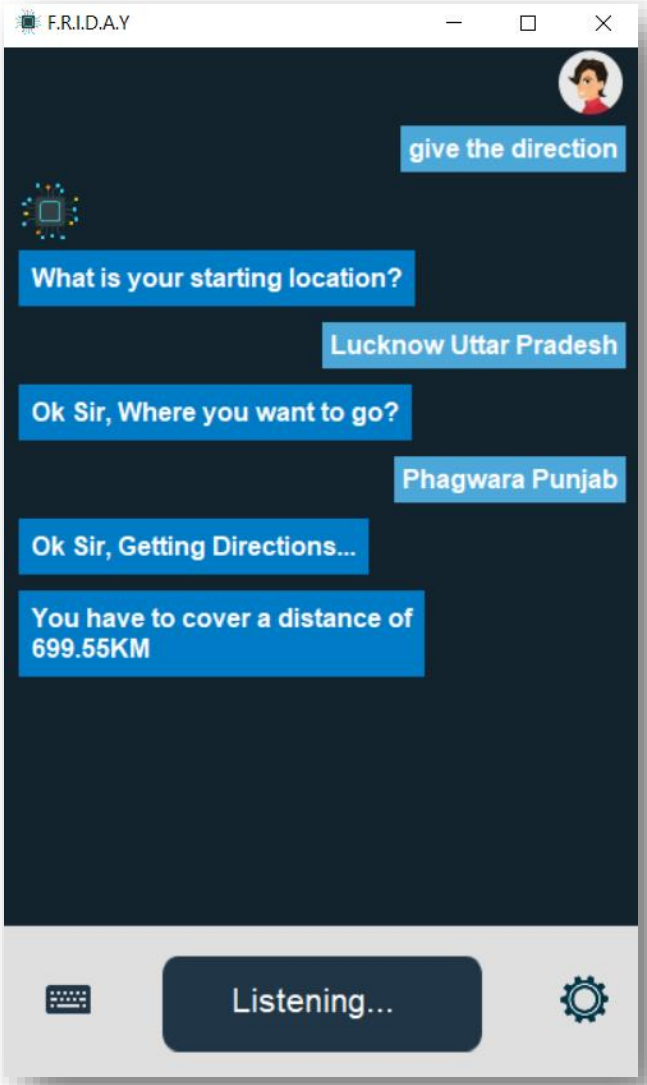


Fig. 10.1

- If the user wants to get directions, he/she can say something like, “Give me directions”, “Get the directions”, “Directions on Map”.
- After that, Assistant will ask user the Starting location and then Destination Location.
- It will then generate a Google Map link, which is then opened in the browser.
- It calculates the total distance between the starting location co-ordinate and destination location co-ordinate and gives the distance in form of KM.
- If user say something like, “Taj Mahal on Google Maps”, “Lucknow on Google Maps”, then it will open that place or area on Google Maps.

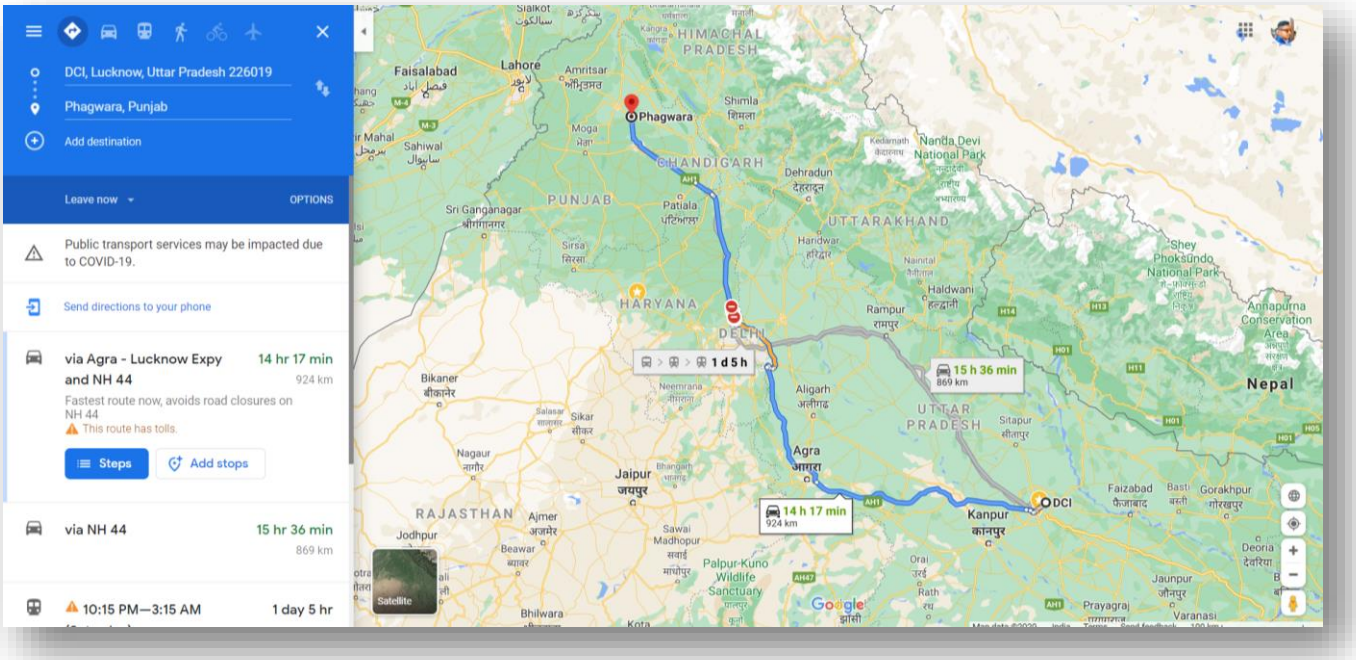


Fig. 10.2

YOUTUBE

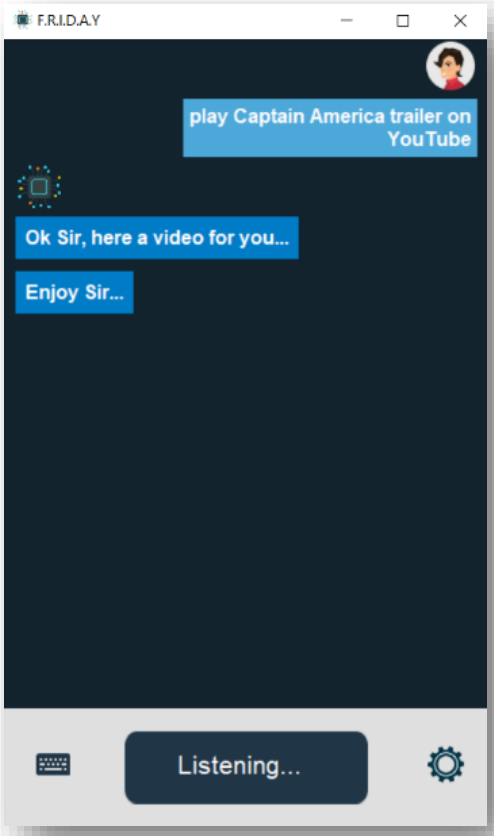


Fig. 11.1

- For playing any video on YouTube the user needs to say the title and specify to play it on YouTube.
- After fetching the title, the assistant will open the web browser and play the video.

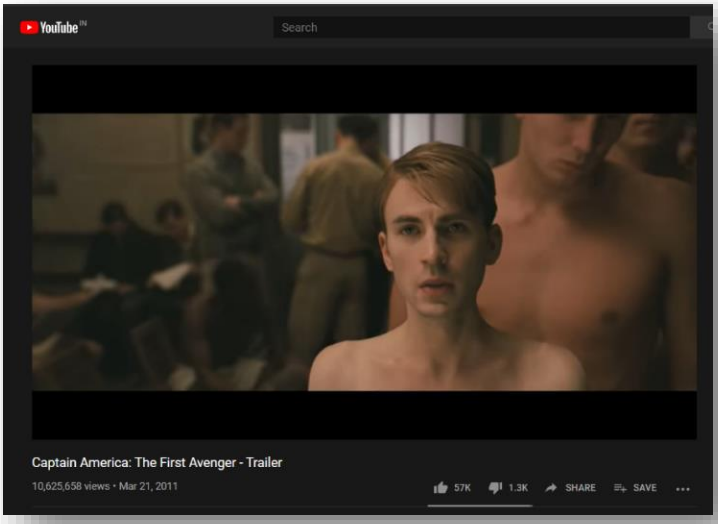


Fig. 11.2

JOKES

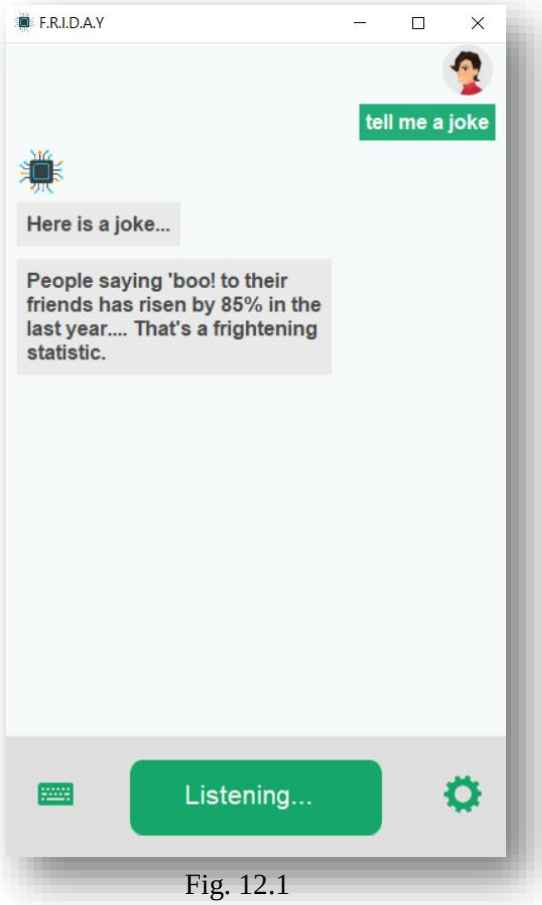


Fig. 12.1

- This feature tells a random joke. To use this feature user can say, “Tell a Joke”, “Give me a joke”, “Tell me funny joke”.
- It then extracts a joke from a website https://icanhazdadjoke.com/ , which gives random jokes.
- Then we show that joke on our chat screen.

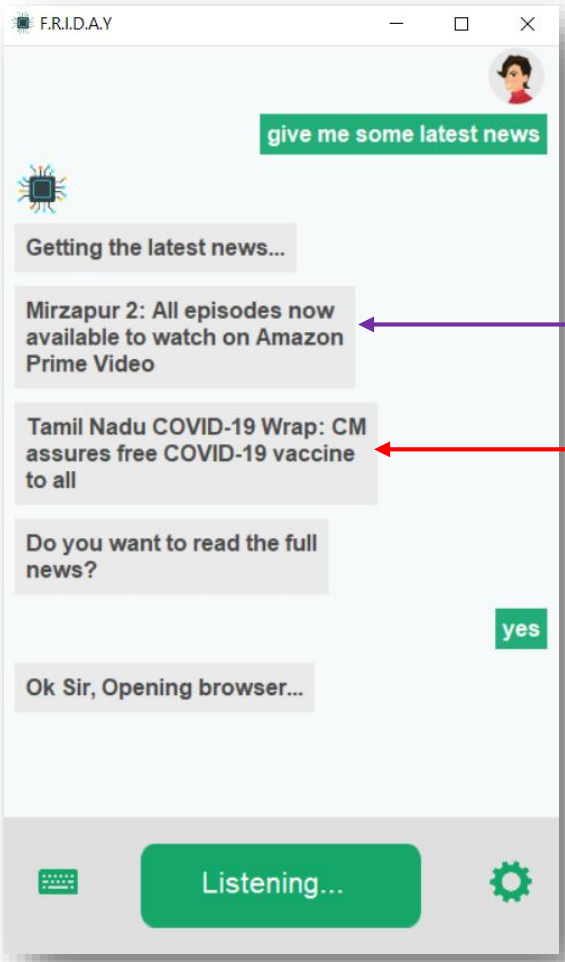


Fig. 13.1

- To get the news, you can say like: "Give the latest news", "Tell me some news", "What is today's news", "What is the latest news?".
- After that, in background it extracts the two latest headlines from the website and speaks those headlines.
- It asks user if he wants to read the full news or not.
- If the user say something like, "Yes", "I want to read", "Yes of course", then the link of that newspaper will get opened in browser, so that the user can read that full news.
- If the user say, "No", "Not now", "I don't want to read", so it will not open the browser.

Fig. 13.2

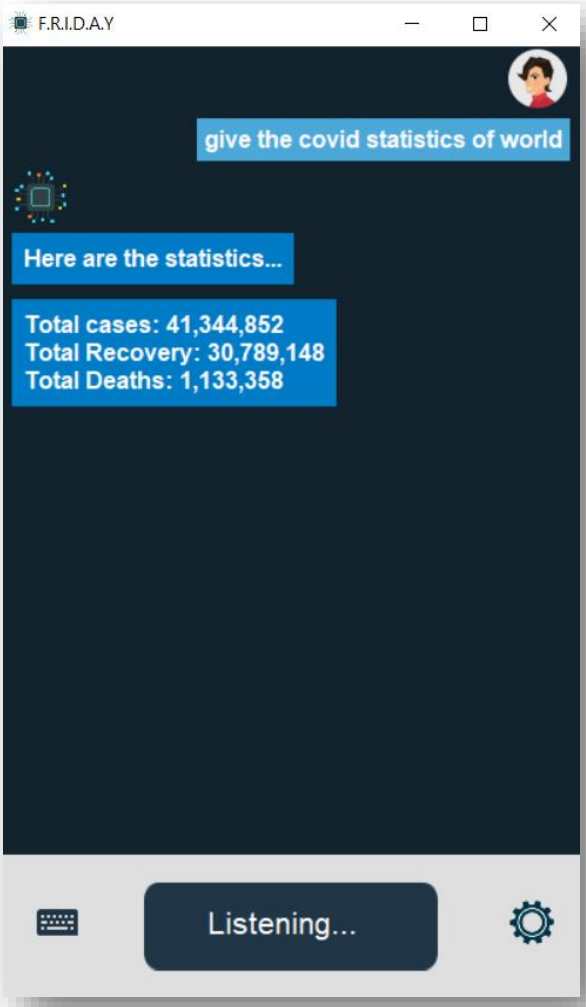


Fig. 14.1

- This feature lets you know about the COVID-19 information of World as well as of India.
- To know about the statistics of COVID-19, you can say something like, “Give me statistics of Coronavirus”, “What is the report of Covid-19”, “Give the COVID statistics of India”.
- It then collects the updated data of Total Cases, Total Recovery and Total Deaths and displays that data.
- To know about particular data, you can say like, “What are the total coronavirus cases?”, “Total Recovery from COVID in India”, “Deaths due to COVID-19”. It will displays only those data.

- It can also tell about the important details or guidelines on COVID-19 like Symptoms and Precautions.
- To know about Symptoms, you can say something like, “Tell me the symptoms of Coronavirus”, “What are the symptoms of COVID?”.
- It then tells the Symptoms of COVID.
- To know about precautions or methods to prevent, you can say “What are the precautions we can take from COVID?”, “Tell the preventions from coronavirus”.
- It then tells all the preventions which we can take from coronavirus.

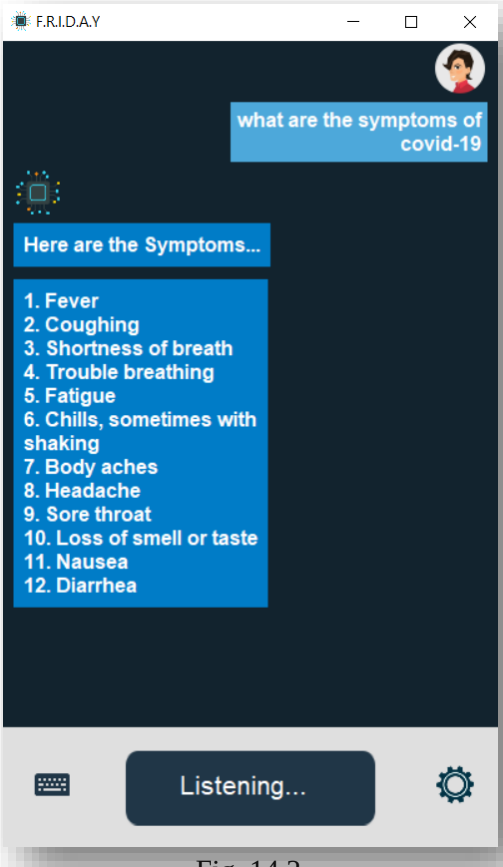


Fig. 14.2

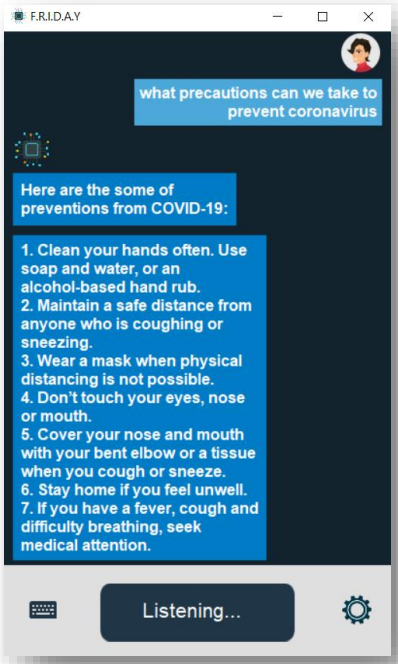


Fig. 14.3

Fig. 14.4

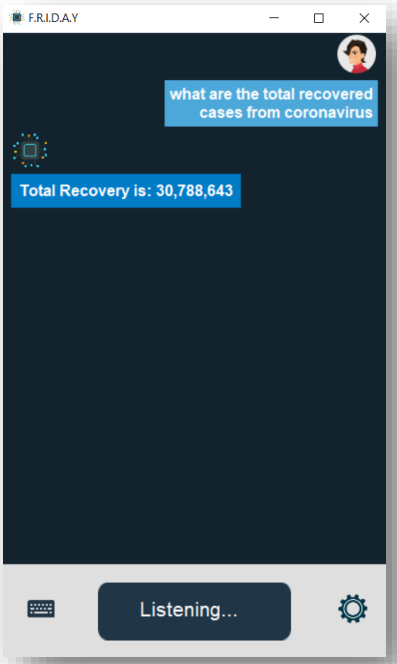


Fig. 14.5

WEATHER

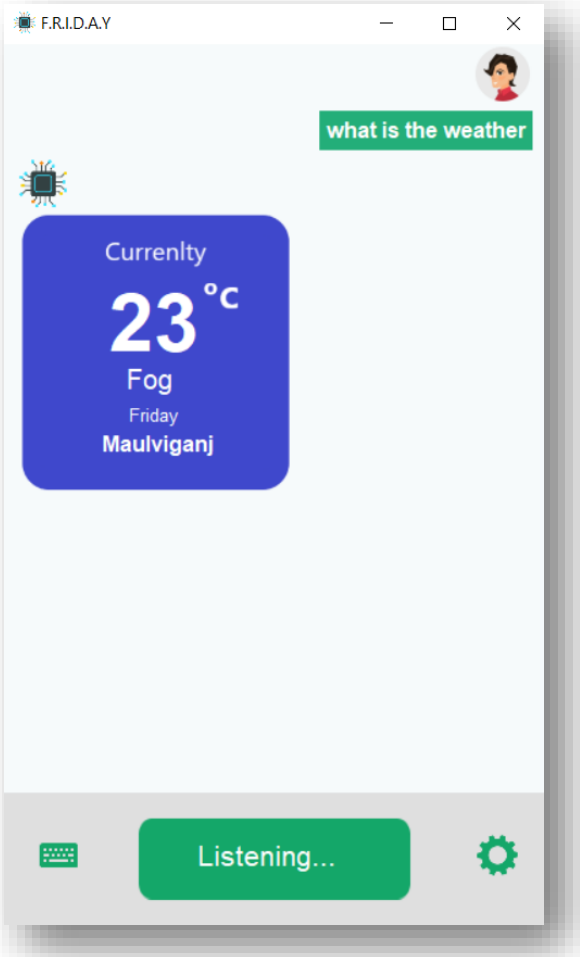


Fig. 15.1

- To know about the weather, we can say something like, "What is the weather today?", "What about weather?", "Tell me the weather".
- It finds the current location of the device, and extract the co-ordinates and generate a weather link. Like: https://weather.com/en-IN/weather/today/l/26.85,80.92
- Through that link it collects data i.e., temperature value, weather condition and the current city.
- It then shows the collected data and the current day in the chat screen and speaks out the data like, "Currently in Maulvinganj, its 23 degree, with a Fog".

WHATSAPP MESSAGE

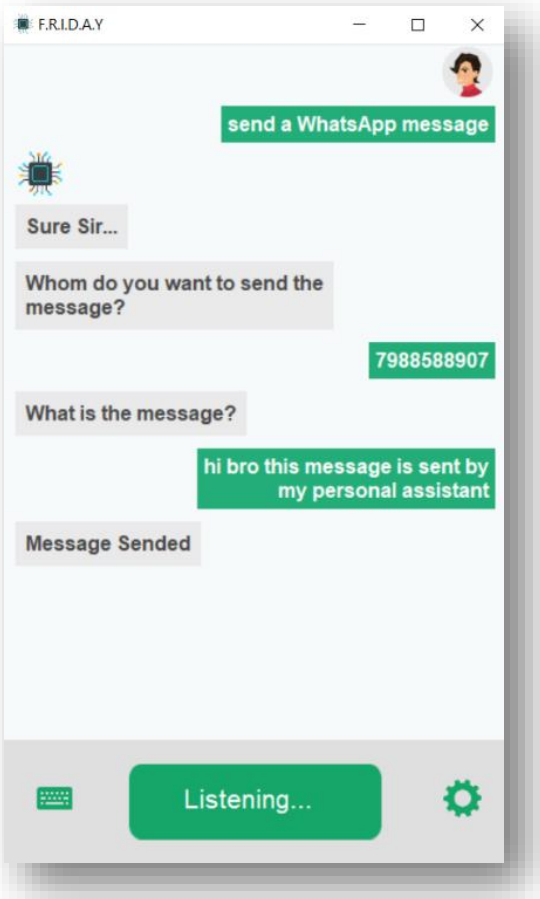


Fig. 16.1

- To send a WhatsApp message the user can say "Send a WhatsApp message".
- After this the assistant will pop up a widow to ask for the phone number.
- After clicking the send button, the assistant will ask the message which the user wants to send.
- After taking the message, WhatsApp web will open and after few seconds the message will be sent and assistant will reply by saying "Message Sent".

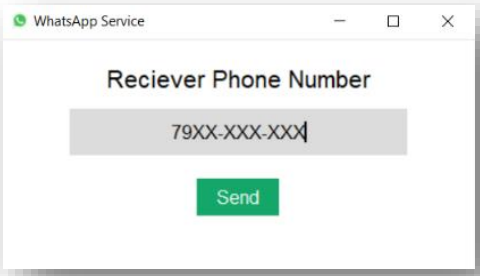


Fig. 16.2

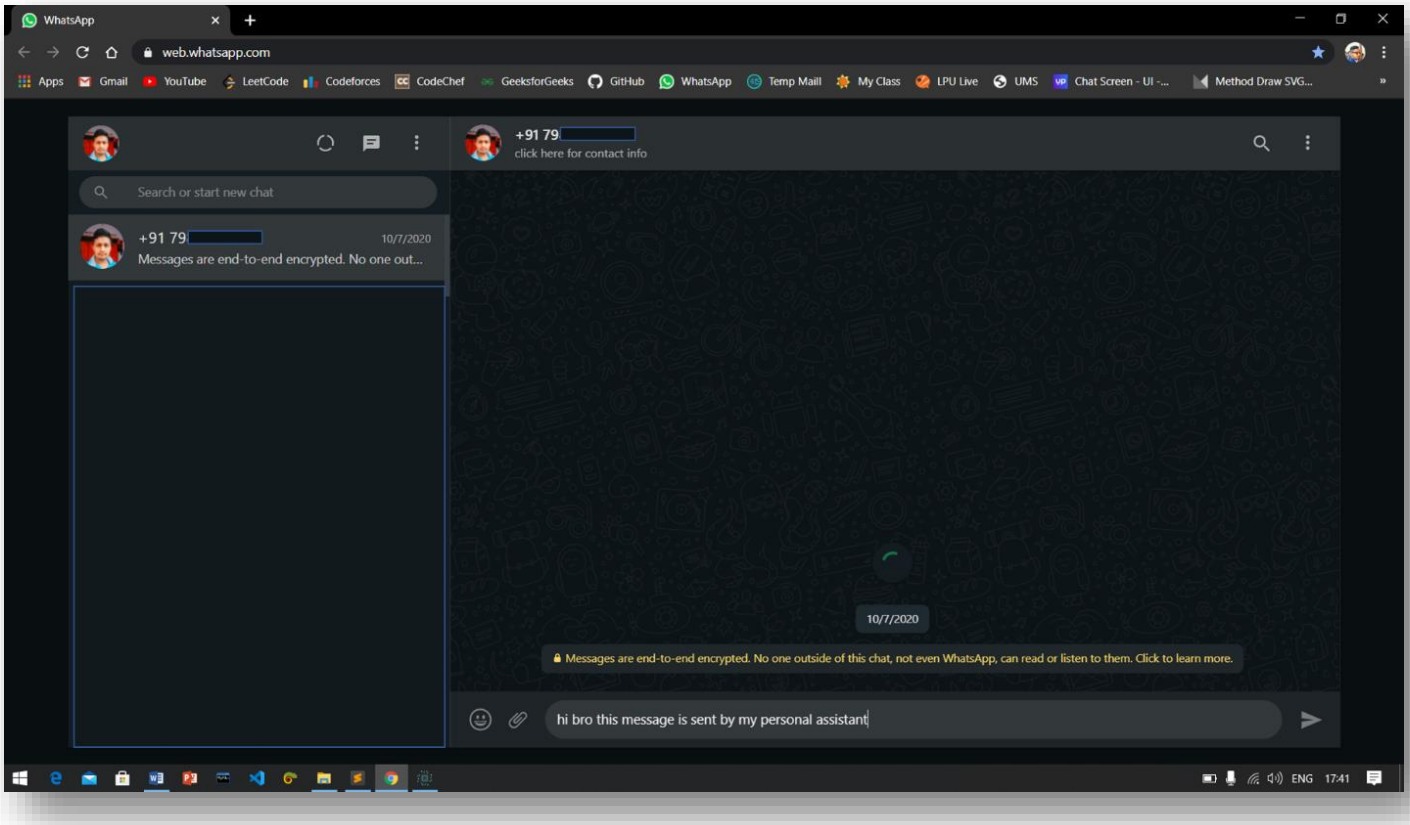


Fig. 16.3

E-MAIL

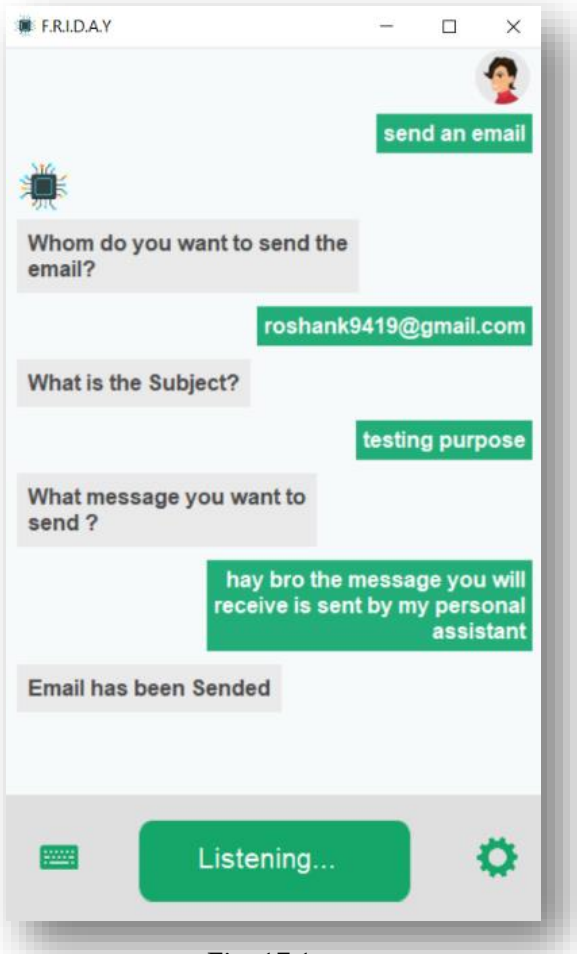


Fig. 17.1

- To send an e-mail the user can say “Send an e-mail”.
- After this the assistant will pop up a widow to ask for the e-mail address.
- After clicking the send button, the assistant will ask the subject of the mail and after that it will ask the content of the mail which the user wants to send.
- After taking this information, the assistant will send the e-mail in a few seconds.
- The assistant will reply by saying ‘’E-mail has been sent”.

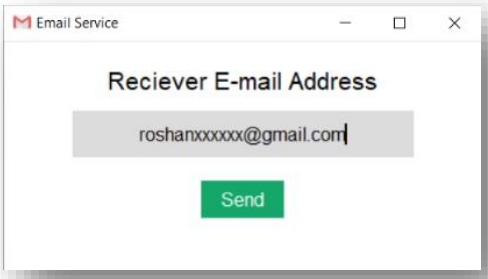


Fig. 17.2

TIMER

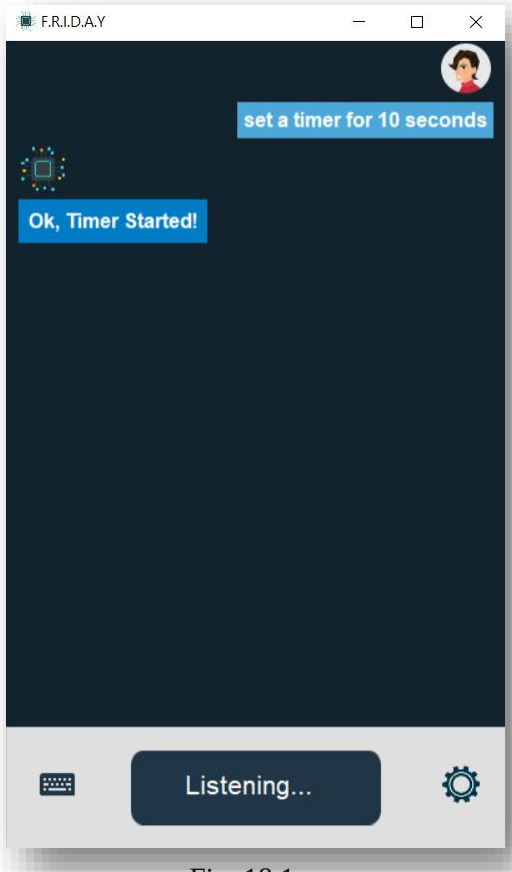


Fig. 18.1

- To use this feature user can say phrase like, “Set a timer for 10 seconds”, “Set a timer for 2 minutes”, “Set a timer for 1 minute 30 seconds”, “Countdown to 20 seconds”.
- It will then extract the time from the query and converts that into seconds.
- It will then start a background process for that particular time interval.
- When the time gets over a pop-up window will appear showing, that Time’s Up, which means that timer has finished.
- User can also set multiple timers at one time, by just saying phrases like, “Set a timer for 10 seconds” then “Set a timer for 1 minute” and so on, i.e., one after the other.

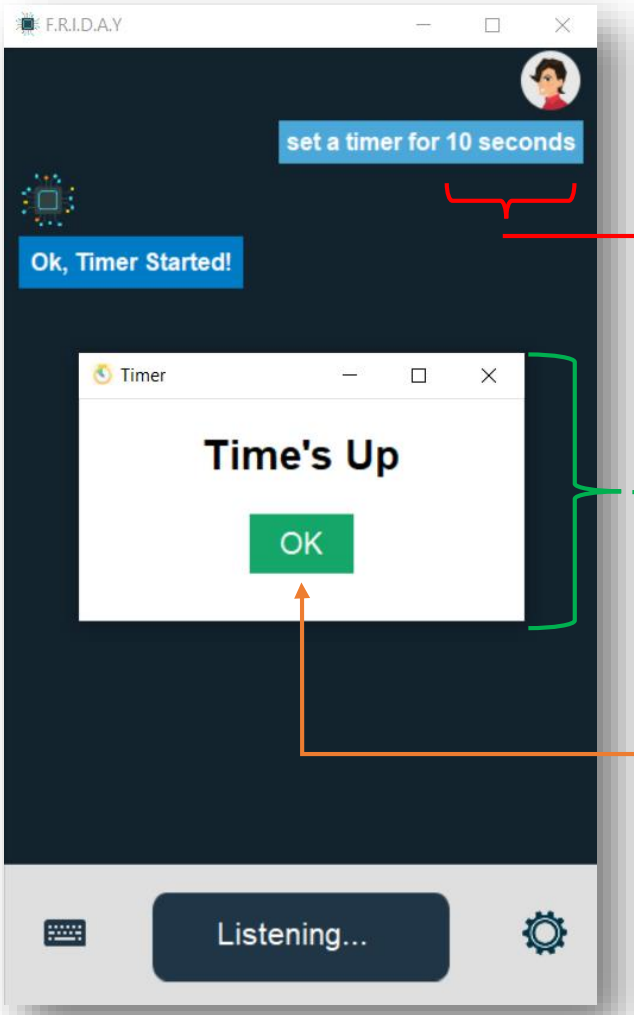


Fig. 18.2

PHOTO CLICKER

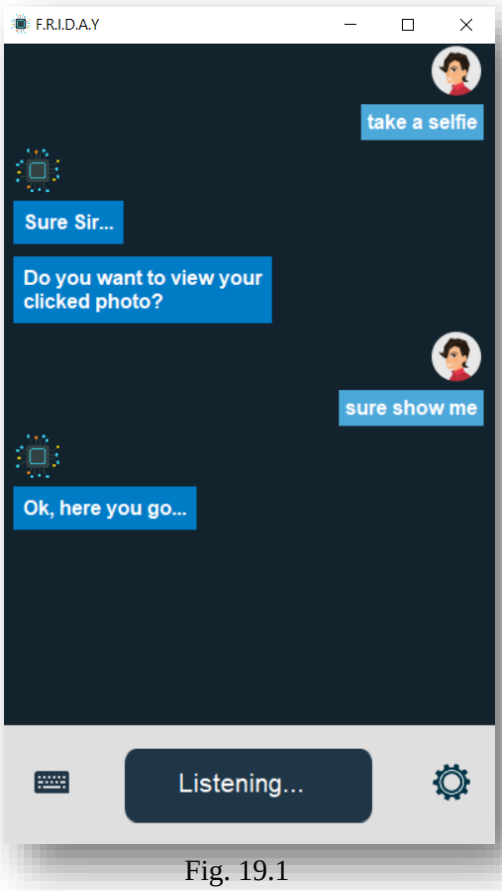


Fig. 19.1

- This module lets you to click photo using the device webcam.
- To use this user can say phrase like, “Take a Selfie”, “Click a photo”, “Take a photo of me”.
- After that, it opens the device webcam in the background and capture the photo and plays a sound of capturing photo, which indicates that photo has been clicked.
- It asks user, weather he/she wants to view that clicked photo or not.
- If user say something like, “Yes”, “Sure”, “I want to view”, “Of course”, “Show me”, then it will open that captured image in the default Photo App of the device.

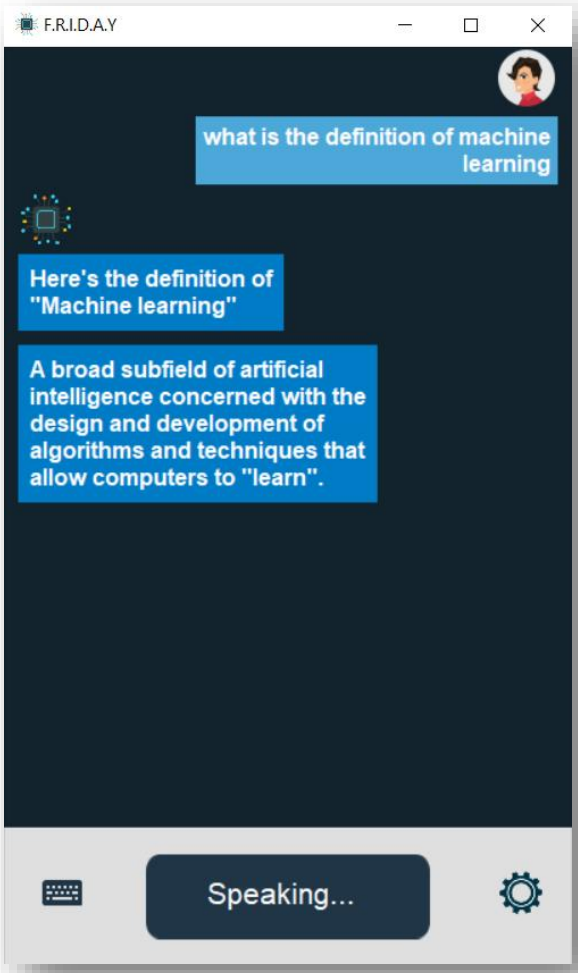


Fig. 20.1

- To get the meaning or definition of a word, just say phrase like: “What is the meaning of Artificial Intelligence”, “Define Machine”, “Definition of Photosynthesis”.
- The query will be passed to a function which will extract the word, and finds in a dictionary file and gives the definition of that word.
- If the word is not found in that dictionary, then it checks the closest word of it because sometime user didn’t spell the word correctly, and then gives the meaning of that word.
- If there is no such word exists, then it says that the “This word doesn’t exist in the dictionary”.

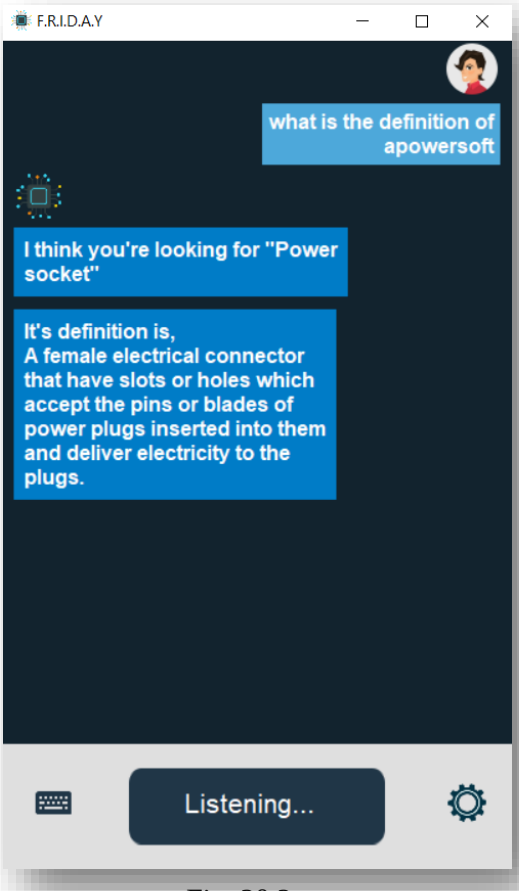


Fig. 20.2

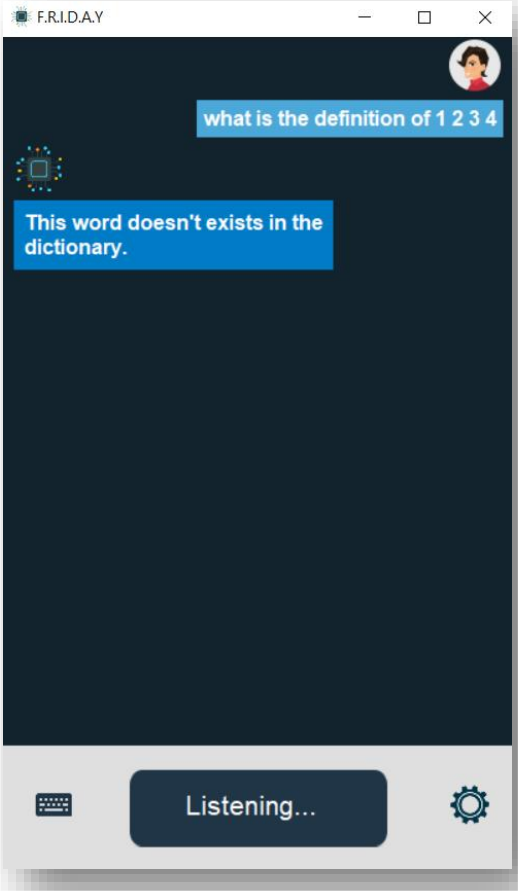


Fig. 20.3

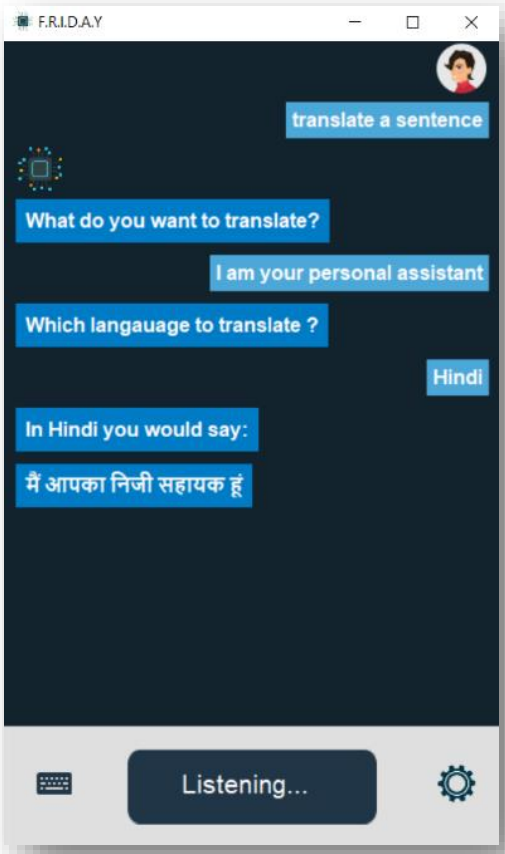


Fig. 21.1

- To translate sentences and words the user needs to say, “translate a sentence”, “translate a word” or “translate for me”.
- Then the assistant will take the input and then ask the language in which the user wants to translate.
- After this the assistant will display and speak the translation of the word or sentence.
- It can do translation in many languages.

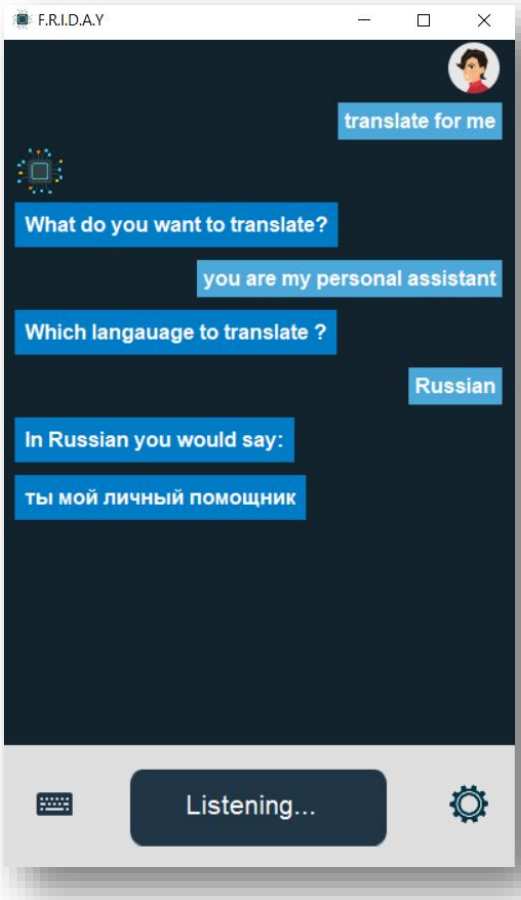


Fig. 21.2

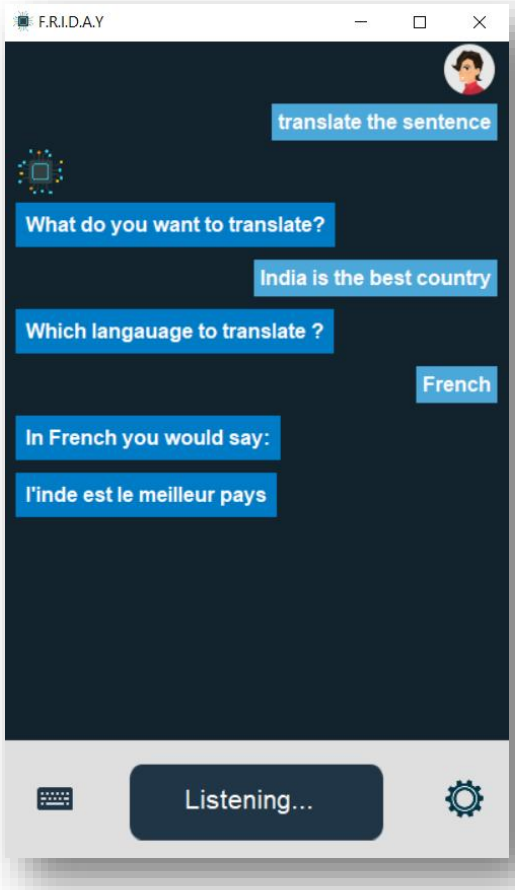


Fig. 21.3

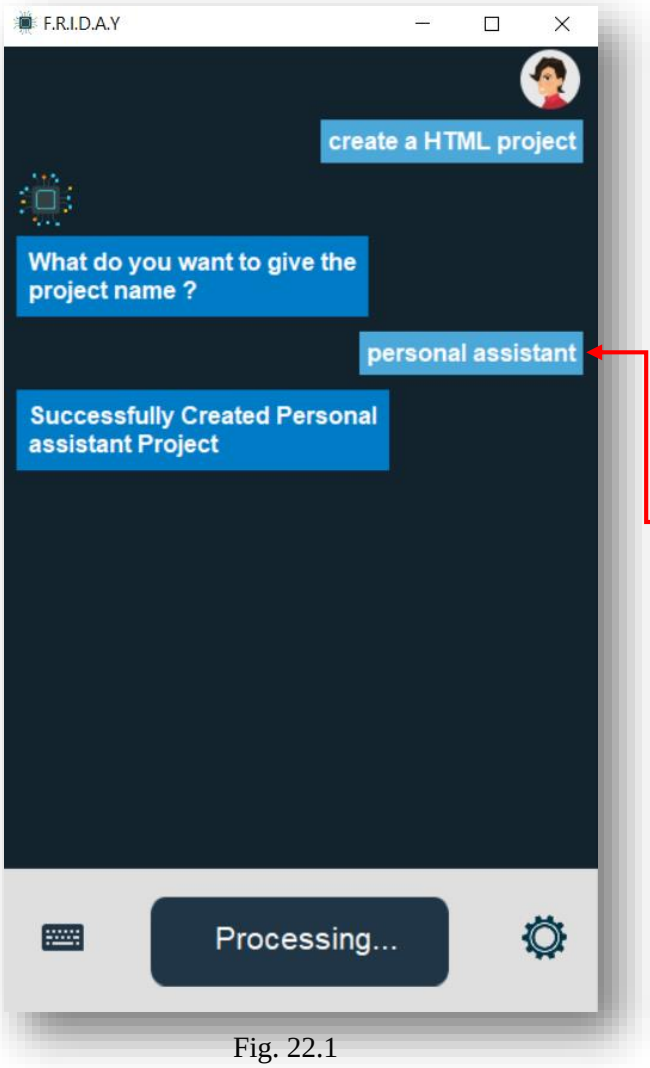


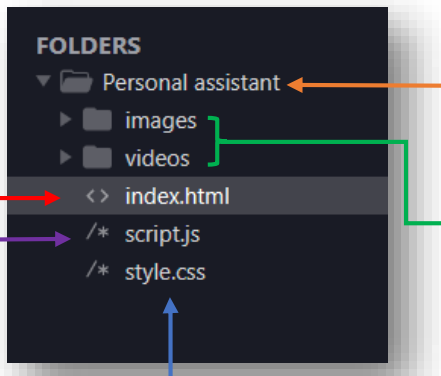
Fig. 22.1

- This feature is most useful for a Web Developer or anyone who wants to create Web Project.
- To use this feature user can say phrases like, “Create a Web Project”, “Create a HTML Project”, “Make a Web Development Project”.
- Then it will ask for the Project Name, “What do you want to give the project name?”, and user have to tell the name for the project.
- It will then create a Web Development Project with necessary files and folders.
- It will open the project with all files in an editor and runs that project in a browser.
- If the same project is already exists, then it will tell the user about it, and opens that website in the browser.

It is an HTML file which has sample code which connects with both style.css and script.js file.

It is an JavaScript file which has a default function to make the button work.

It is a CSS file which contains some default styling for the website.



Project Name

Necessary folders to store images and videos for the project.

Fig. 22.2

TO-DO LIST

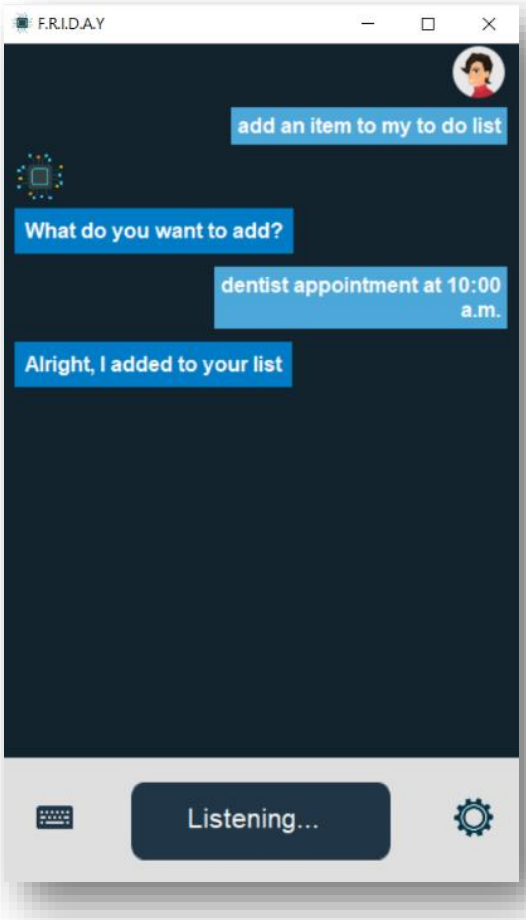


Fig. 23.1

- To create or edit a to do list the user has to say “create a to do list” or “add an item to the to do list”.
- The assistant will ask what the user wants to add.
- After adding the item, the assistant give confirmation.

- To view the items in the to-do list, user can say something like “Show my to-do list”, “What’s on my to-do list?”.
- Then the assistant will display the whole to-do list and speaks out the total items in the list.

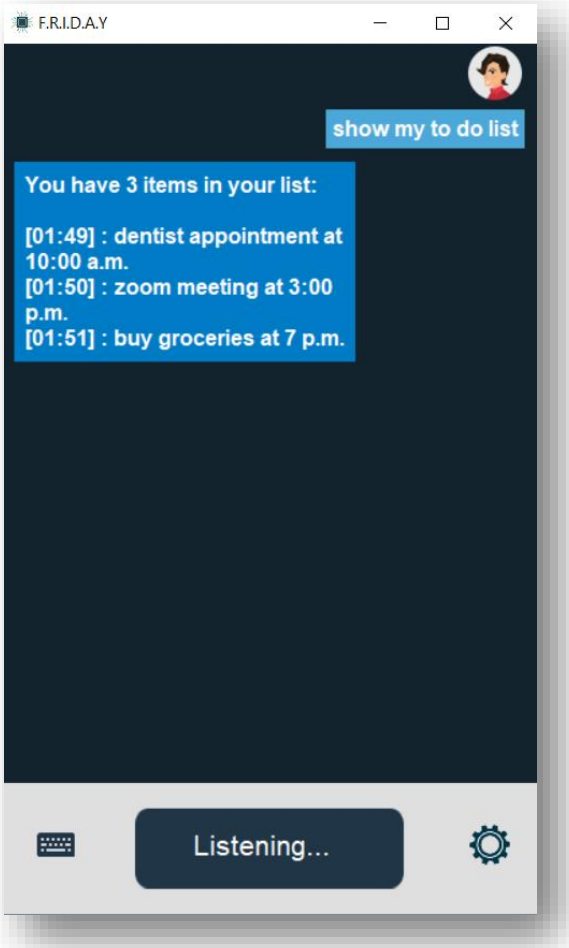


Fig. 23.2

FILE OPERATIONS

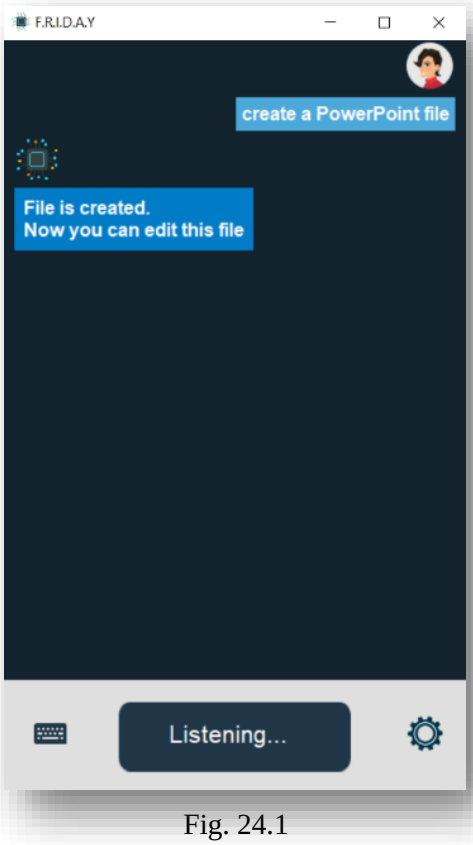


Fig. 24.1

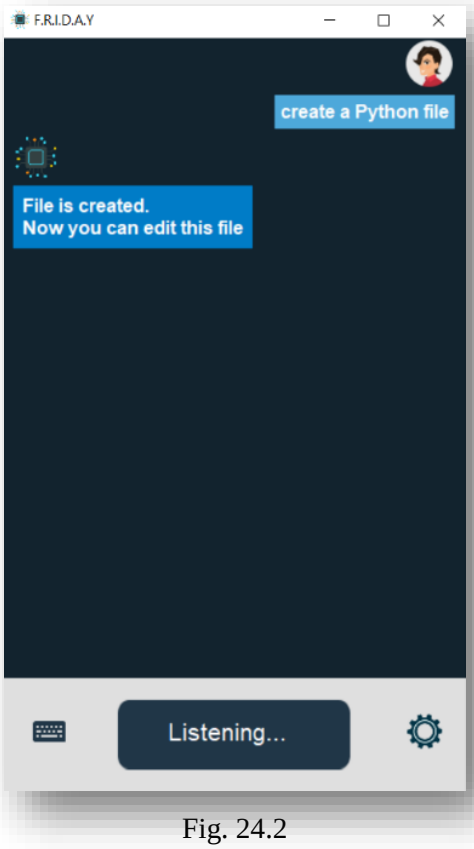


Fig. 24.2

- The user can create any type of file that he/she wants.
- The file will open in Sublime text except MS files which will open in their respective applications.

MATH

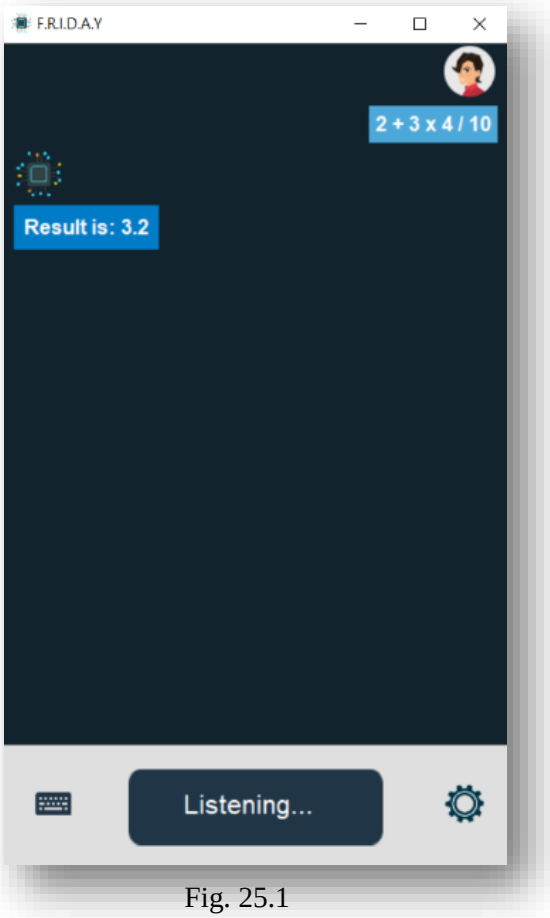


Fig. 25.1

- The assistant can also perform mathematical calculations using math library.

- It can perform calculations like:
  - Basic Calculations (+, -, *, /, power, root)
  - Conversions (Binary, Octal, Hexadecimal)
  - Logical Operations (SHL, SHR, AND, OR, XOR, NOT)
  - Trigonometry (Sin, Cos, Tan)
  - Logarithmic
  - Factorial

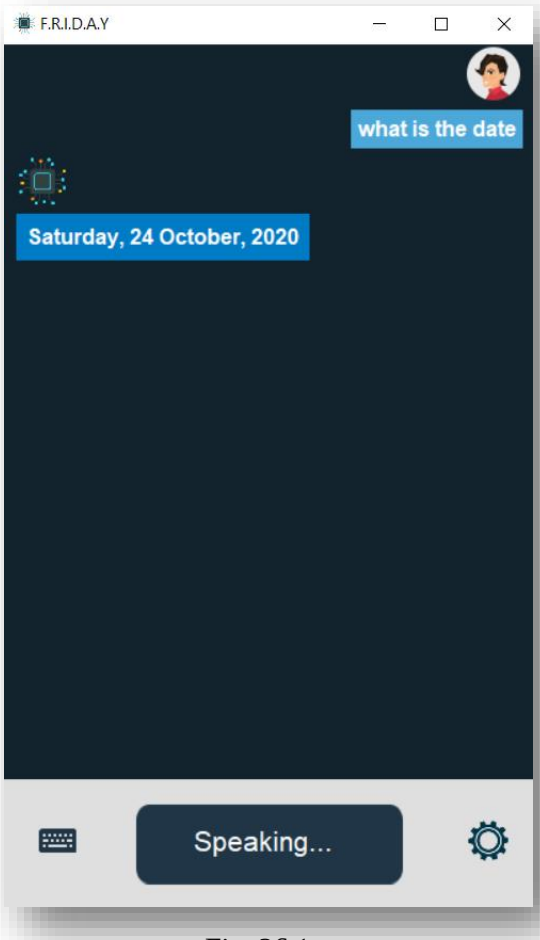


Fig. 26.1

- This module give the current date & time when user say something like, “Tell me the date”, “What is the date?”, “What date it is today?”.
- It finds the system date time and extract the day name, month name, date and year.
- It then displays and speaks out the result.

- Similarly, if the user say “Tell me the time”, “What time is it?”, “What is the time?”, then it tells the time.
- It finds the current time and calculates that it is A.M. or P.M. and then displays and speaks out the result.

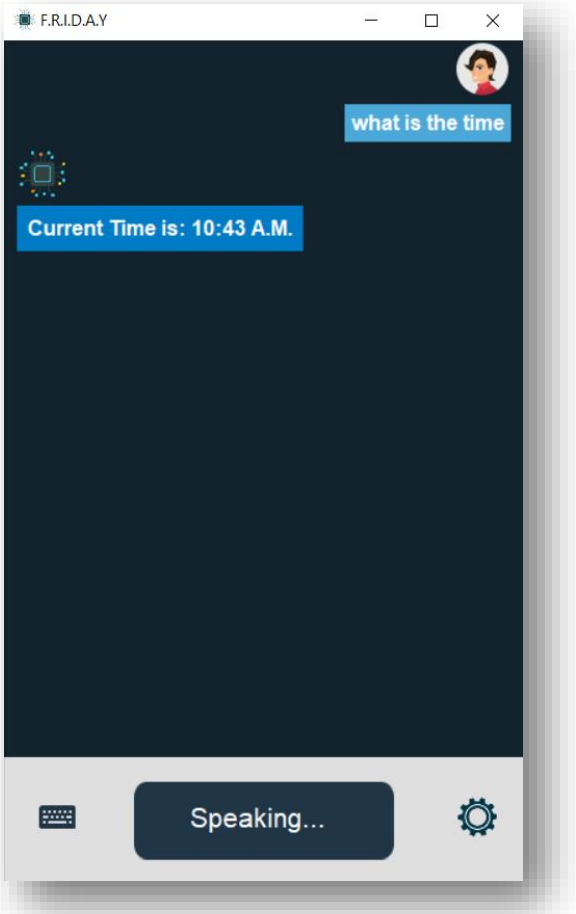


Fig. 26.2

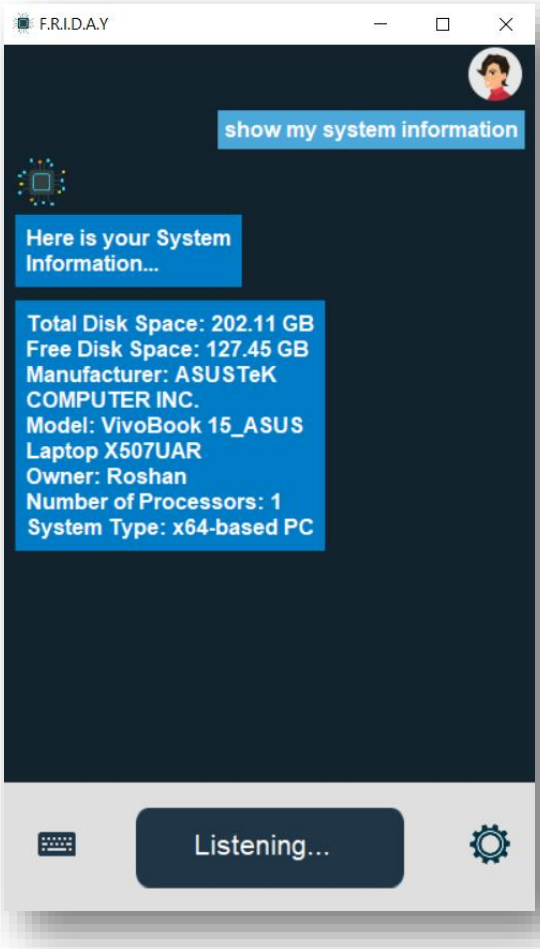


Fig. 27.1

- To know about your System, you can say “Give the System Information”, “What is my System Information”, “Show my System Configuration”.
- It will then find the Local Disk Total Size, Free Space, the manufacturer of the product (Laptop, PC), Model, Owner of the device, Number of Processors, System type (x86, x64)
- It will then display all the information on chat screen.

- To know about the current battery status, user can say “What’s my battery percentage?”, “What is the battery Status?”.
- It will then find the device battery percentage and check if it is charging or not.
- It will speak the information.

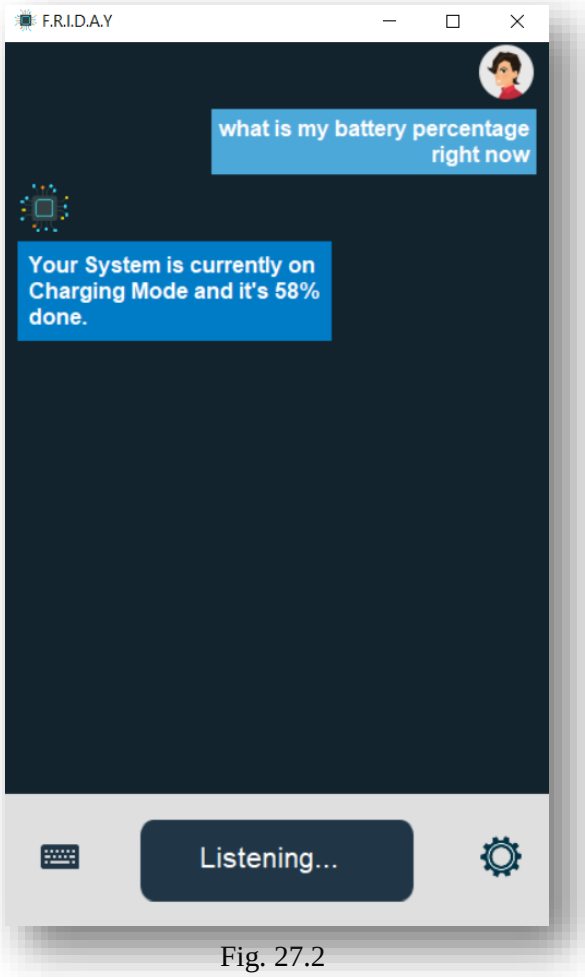


Fig. 27.2

WINDOW TASKS

It can access the window operations like:

- Taking Screenshot – it captures the complete active screen and saves that to a folder.
  - Say “Take a Screenshot”

- Minimizing, Maximizing, Closing, Switching, Moving:
  - Say “Minimize the window”
  - Say “Maximize the window”
  - Say “Move window to left”
  - Say “Move window to right”
  - Say “Switch window”
  - Say “Close the window”

TAB TASKS

It can access the tab operations like:

- Creating, Switching, Closing:
  - Say “Create a new tab” or Say “Open a new tab”
  - Say “Switch tab”
  - Say “Close the tab”

SYSTEM APPS, KEYBOARD CONTROL, VOLUME CONTROL

It can access the System Apps like:

- Opening Apps:
  - Say “Open Paint”
  - Say “Open WordPad”
  - Say “Open Notepad”

- Keyboard Control:
  - Say Type “This is a sample text” (It will type the text which you tell)
  - Say “Select all” (Selects all the content)
  - Say “Delete that” (Delete the selected text)
  - Say “Press Enter” (Let you to go to the next line)
  - Say “Save that” (It will save the file)
  - Say “Don’t Save” (It will choose Don’t save option at time of closing the window)

- Volume Control:
  - Say “Increase the volume” (It will increase the current volume by 10)
  - Say “Decrease the volume” (It will decrease the current volume by 10)
  - Say “Mute Volume” (It will mute the volume completely)
  - Say “Full Volume” (Increases the volume to full i.e., upto 100)

WEBSITES OPENING

It will open the websites in a browser:

- Say “Open Google”
- Say “Open GeeksForGeeks”
- Say “Open Stack Overflow”
- Say “Open My Class”
- Say “Open UMS”
- Say “Open LPU LIVE”

NORMAL CHATS

It can also reply to normal chats, below is the normal chat doing between both user and assistant:

User : What is my name?

Assistant: Your name is, XYZ

User : How are you?

Assistant: I’m good, what about you?

User : Who are you?

Assistant: Did I forget to Introduce myself? I’m your Personal Assistant.

User : I’m alone

Assistant: Don’t feel lonely. I’m always with you.

User : Tell me something

Assistant: Hmm, you can ask me to tell a joke.

User : Which colour you like ?

Assistant: I like all the 7 Colours of a rainbow.

User : I have a question

Assistant: Ask me, I can help you.

User : You are so funny

Assistant: Good to know, that I'm funny - Haha !

PROJECT OUTCOMES AND LEARNINGS

As a result of this project, we became acquainted with various modules in python such as Tkinter, Speech Recognition, Text-To-Speech, OpenCV, and Beautiful Soup.

The learnings are as follows:

- Web Scrapping using Beautiful Soup
- GUI using Tkinter
- Face recognition using OpenCV
- Converting speech to text and text to speech using Speech Recognition and Text-to-Speech respectively.
- Sending e-mails using Simple Mail Transfer Protocol (SMTP)
- Getting system information and managing files using the os module
- Using threading to make to program faster
- Math operations using the math module
- Using geopy for getting a location on a map
- Using pynput library to control and monitor mouse and keyboard input.

CONCLUSION

F.R.I.D.A.Y. can make day to day tasks easier to perform. We can send emails, search queries in Google, search for videos on YouTube, retrieving images, live weather conditions, word meanings, and telling the user about the scheduled events and tasks. It helps to make a regular user, a power user. The project is made in such a way that it can tackle every user query efficiently. By working on the project we broadened our horizon of knowledge. This project is just the first step towards learning advanced technologies.

REFERENCES

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