Team Name: **AI-Personal-Assistant**

Submitted By

Debabrata Mallick: 203051004

Problem Statement:

A personal assistant that can do tasks like open any websites, open any software, search on Wikipedia, mail, and many other things such as Google's Assistance, Apple's Siri, and Amazon's Alexa using voice command. But from an AI course point of view, we want assistance that can teach us AI topics like Resolution Algorithm, A* star search, etc. just like a tutor. We will have a web page for taking the voice command and the result will be shown on the web page itself and it can demonstrate the things by voice assistance.

After implementing this project we have assistance which will do our job. We don't have to do much and by this, we can save our priceless time. For example, if we want to open VS Code for coding or something else, we will give the command like "open VS Code" and it will open VS Code for us, we don't have to search vs code or go to vs code icon and open it.

Features of our AI Personal Assistant:

- **It can search something on Wikipedia**
- **It can open YouTube site in the browser**
- **It can open Google site in the browser**
- **It can play music**
- **It can open a gallery**
- **It can know the current time**
- **It can open VS Code Program**
- **It can send Email**
- **It can show the result of the resolution theorem with an example**
- **It can draw various figures**
- **It can give an optimal path according to the A* search algorithm.**

So we have built an AI voice personal assistant in our project that takes user input from the web using voice commands and gives the results accordingly.

Architecture on the end-to-end system:

We have done 50 % coding in vs code using the python language and 80 % - 90 % in the Django framework.

Libraries:

To build a personal voice assistant it's necessary to install the following packages in your system using the pip command.

1) Speech recognition — Speech recognition is an important feature used in house automation and in artificial intelligence devices. The main function of this library is it tries to understand whatever the humans speak and converts the speech to text.

2) pyttsx3 — pyttxs3 is a text-to-speech conversion library in python. This package supports text to speech engines on Mac os x, Windows, and Linux.

3) Wikipedia — Wikipedia is a multilingual online encyclopedia used by many people from the academic community ranging from freshmen to students to professors who wants to gain information on a particular topic. This package in python extracts data required from Wikipedia.

4) datetime — This is an inbuilt module in python and it works on date and time

5) **os** — This module is a standard library in python and it provides the function to interact with the operating system

8**) Web browser** — This is an in-built package in python. It extracts data from the web

11) **request-** The request module is used to send all types of HTTP requests. Its accepts URL as parameters and gives access to the given URL'S.

10) **Turtle** — is a pre-installed Python library that enables users to create pictures and shapes by providing them with a virtual canvas. The onscreen pen that you use for drawing is called the turtle and this is what gives the library its name.

- We have used Microsoft Visual Studio to write all our code.

Block Diagram of Our Code:

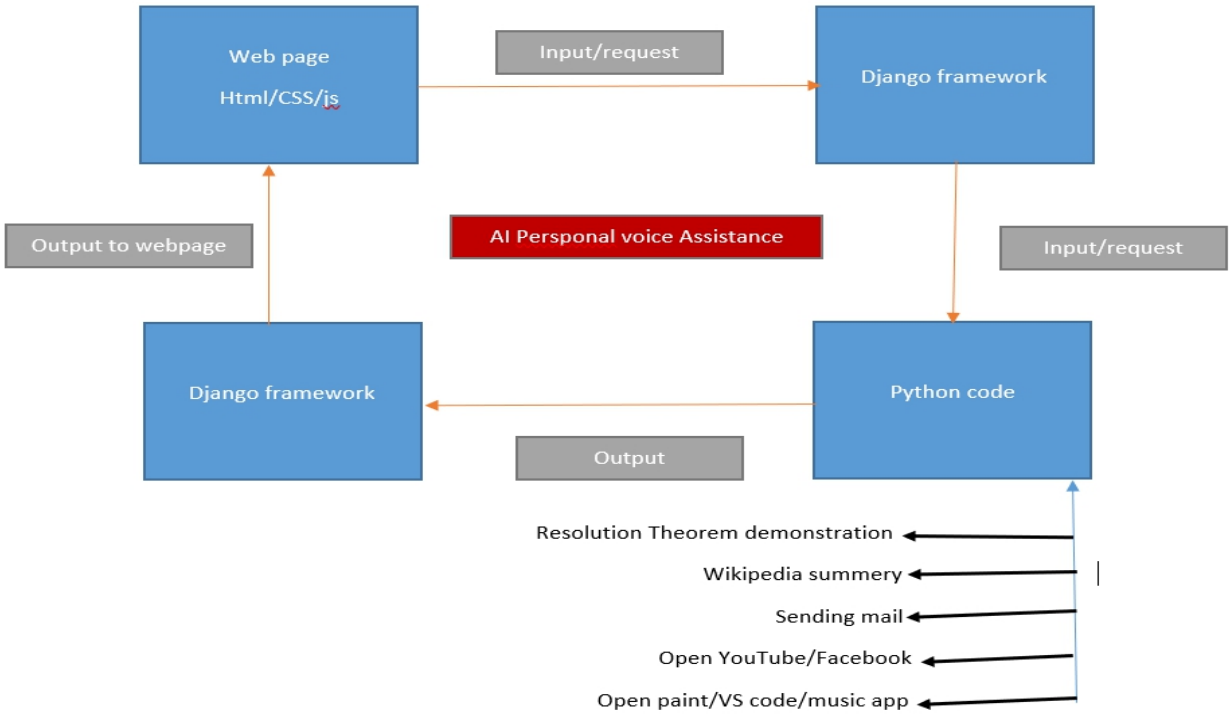


Figure 1

Progress report:

Finished Work: We have made an AI personal assistant which can listen to our commands such as playing music, sending an email, getting the current time, searching for something on Wikipedia and many more tasks can be done using our personal assistant.

```
s/Python/Python39/python.exe c:/Users/shubh/Desktop/mynewpython/m
ain.py
listening
Recognizing...
user said:what is the time
23:36:12
```

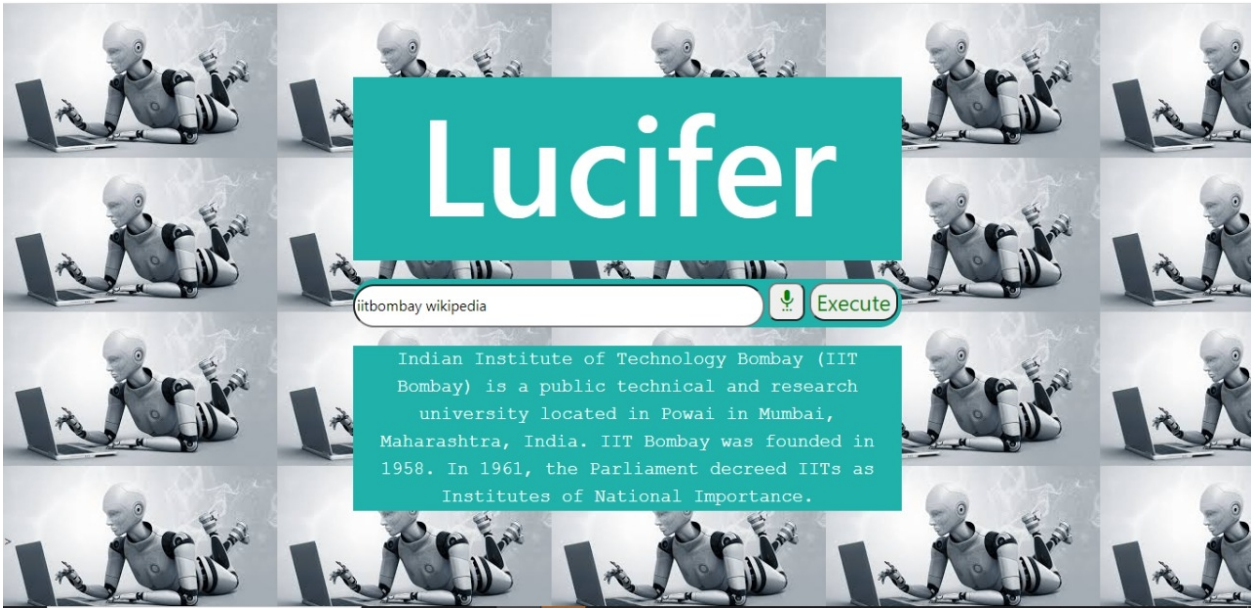
Figure 2

- We integrated our AI personal assistant to a webpage where we can give commands to the personal assistants and the commands can be used to see the result on the webpage.
- We have created the skeleton of our webpage using HTML.
- We have designed our webpage using CSS, javascript, and bootstrap.

- This is the screenshot of our AI voice assistant homepage in a Web form.

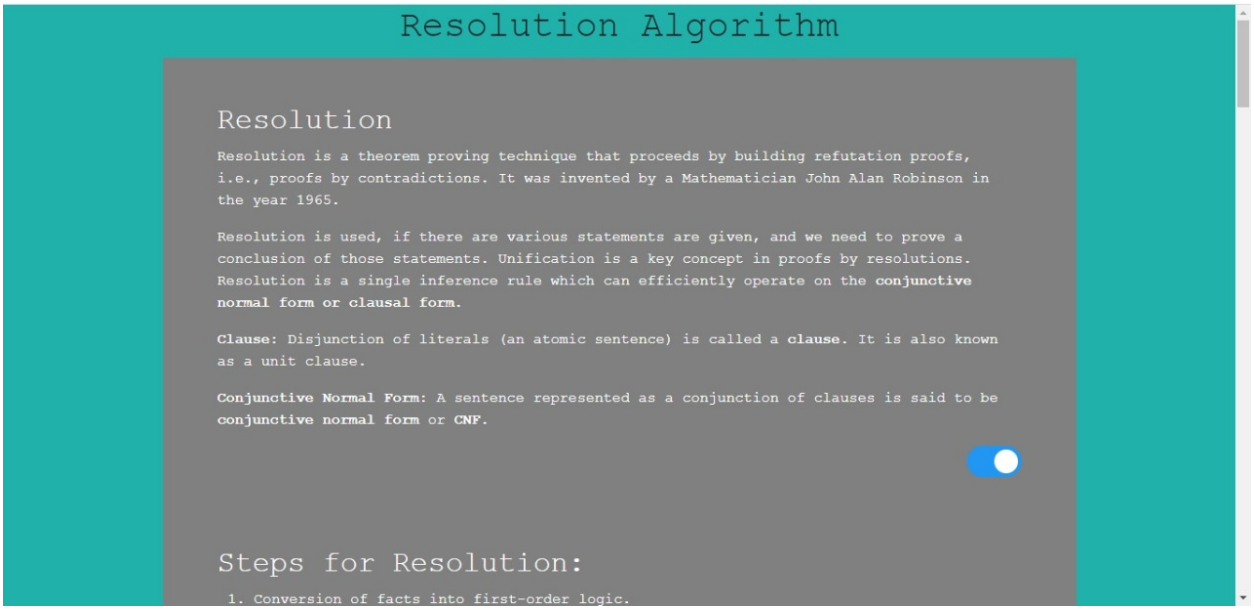
Voice Commands Results Screenshots:

The AI is telling about himself or can give an intro about itself when asked.

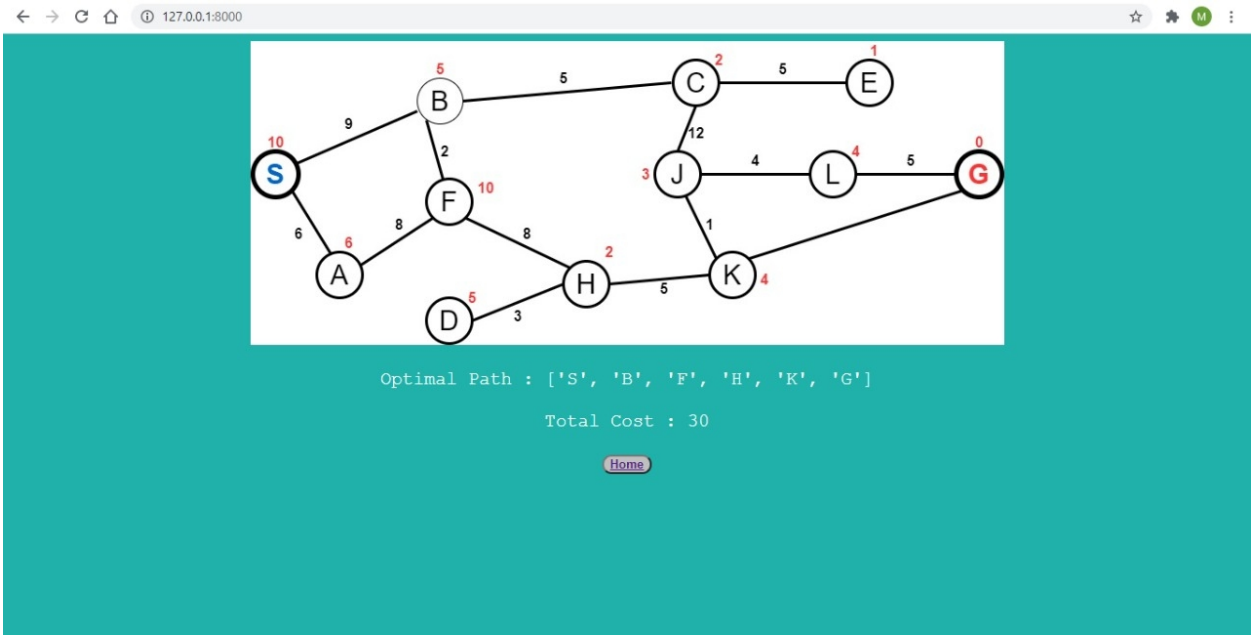


This screenshot demonstrates and also speaks the contents once we search something on Wikipedia from our voice assistant

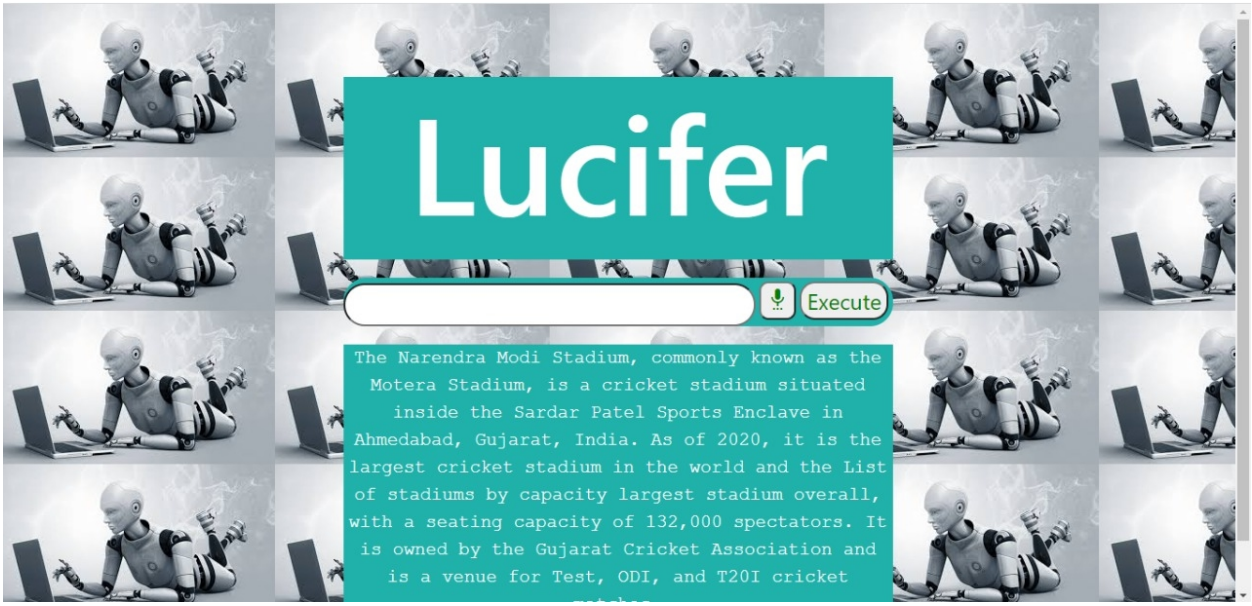
This screenshot shows the current time.



This screenshot takes the Resolution theorem as a voice command and shows an example of it on the Web step by step.

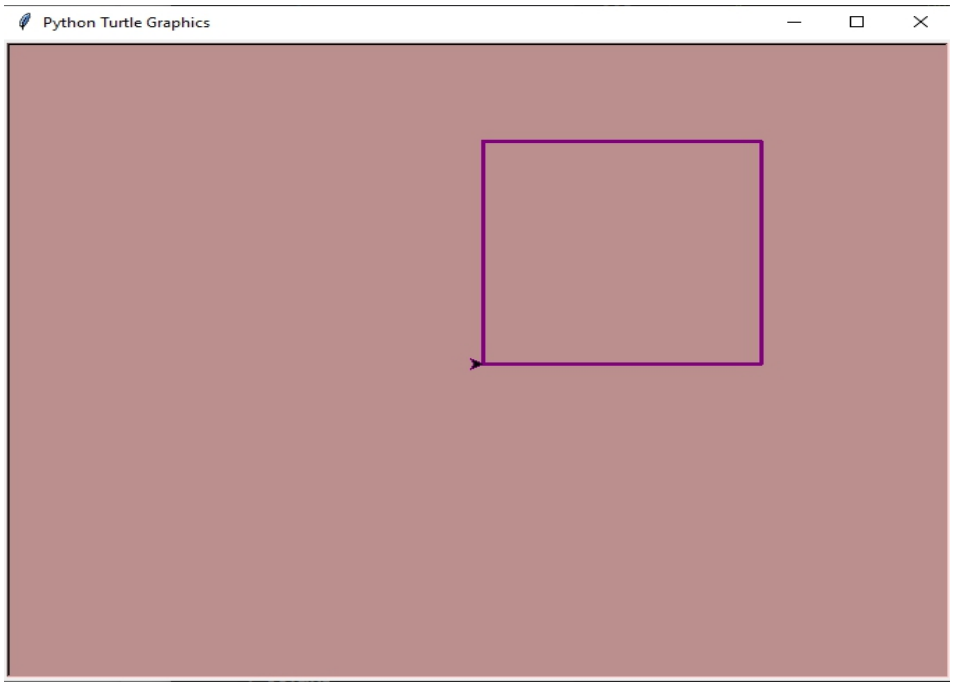


The AI assistant giving an optimal path according to the A* search algorithm.

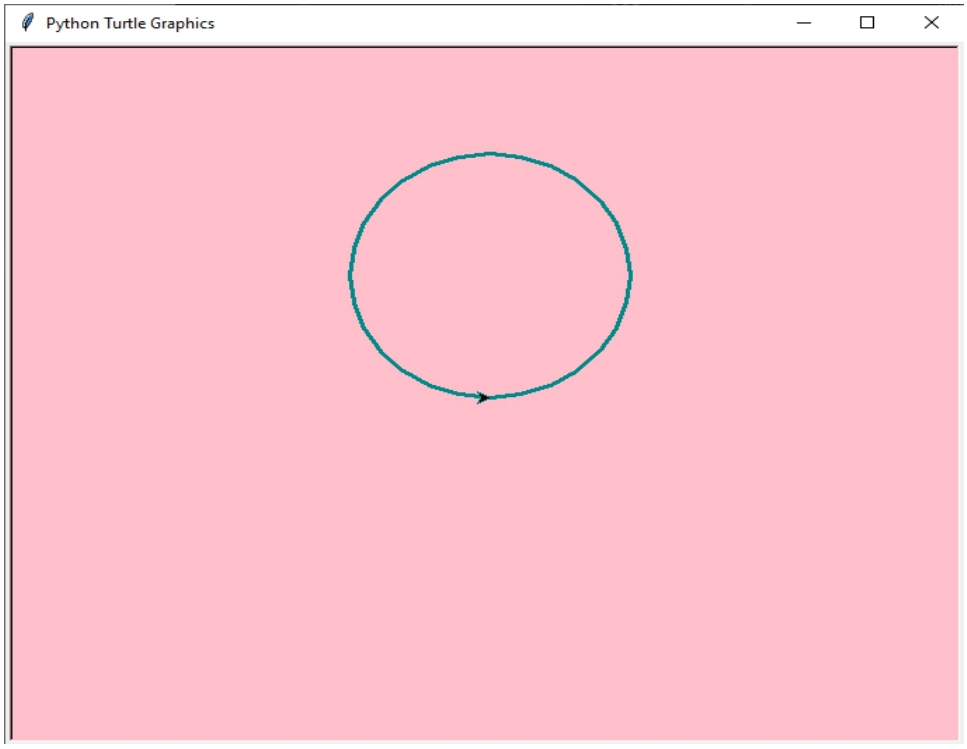


The AI assistant is able to collect information about a well-known person and can show results.

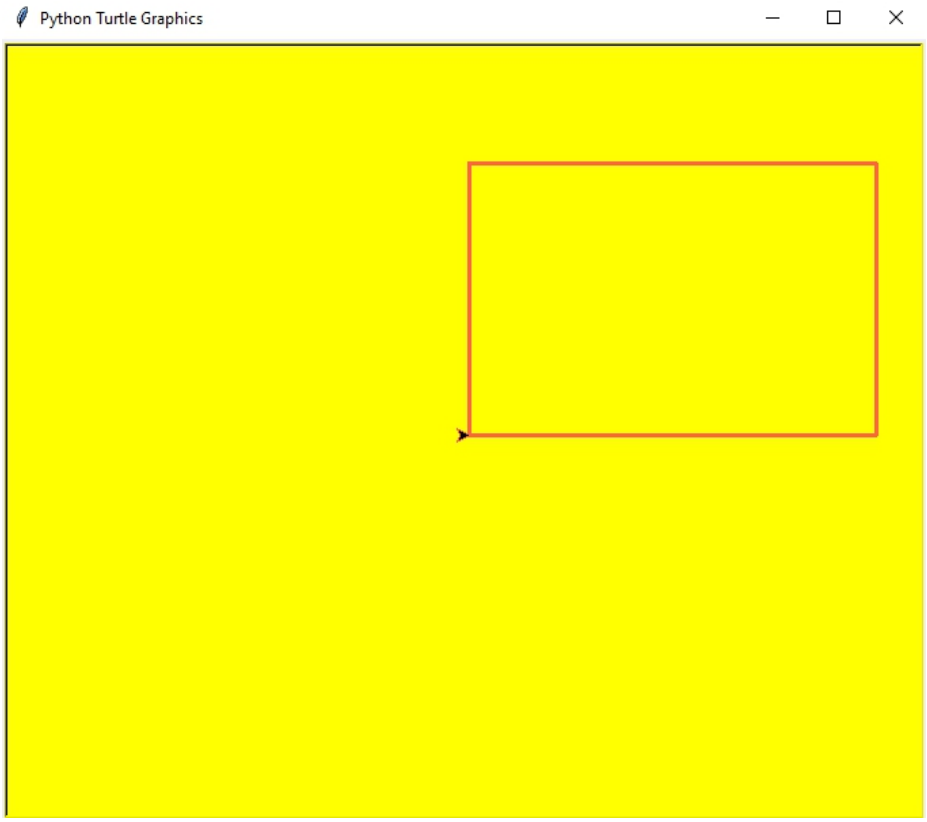
Our AI Voice assistant also can draw various figures like circles, rectangles, squares, Olympic logos, Spiral squares, rainbow, etc.



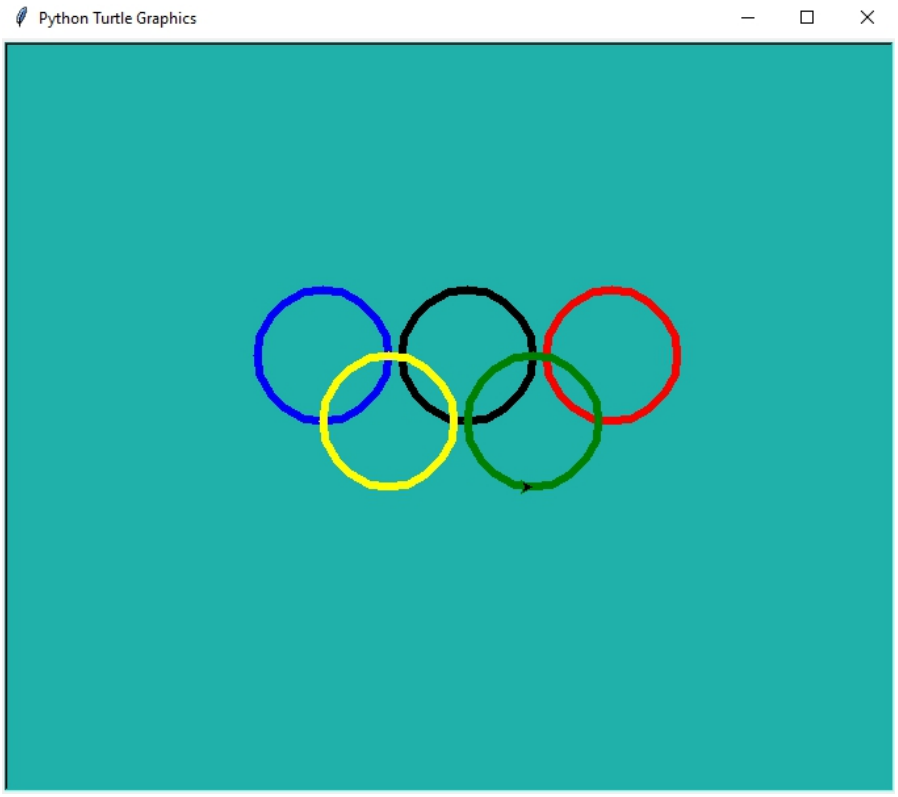
Using voice command drawing a square with a side of 100



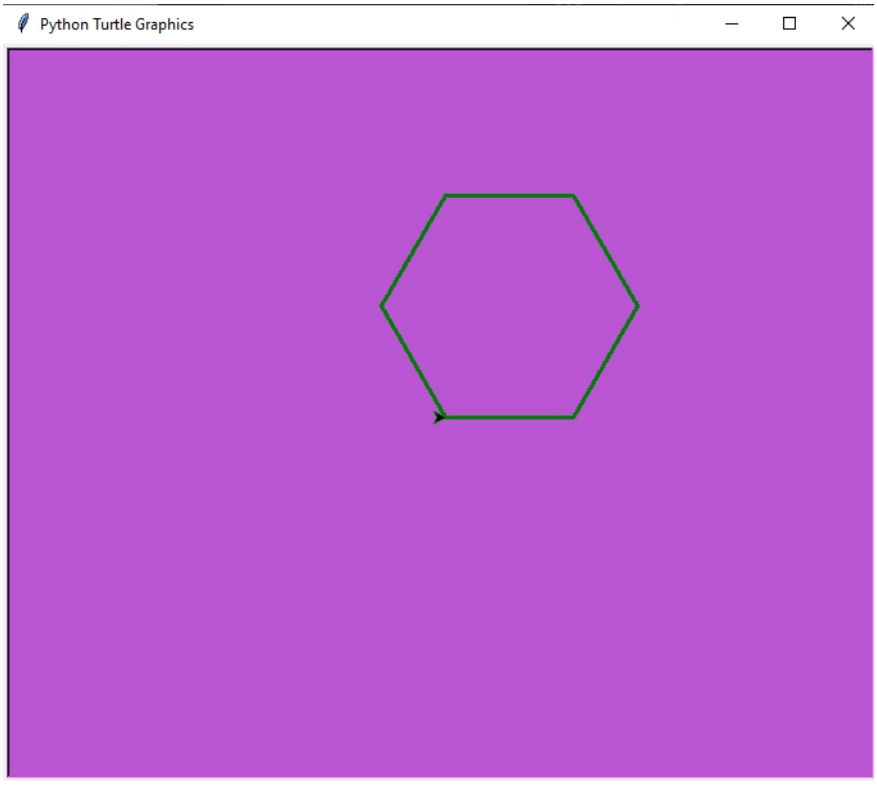
Using voice command drawing a circle having a radius (90)



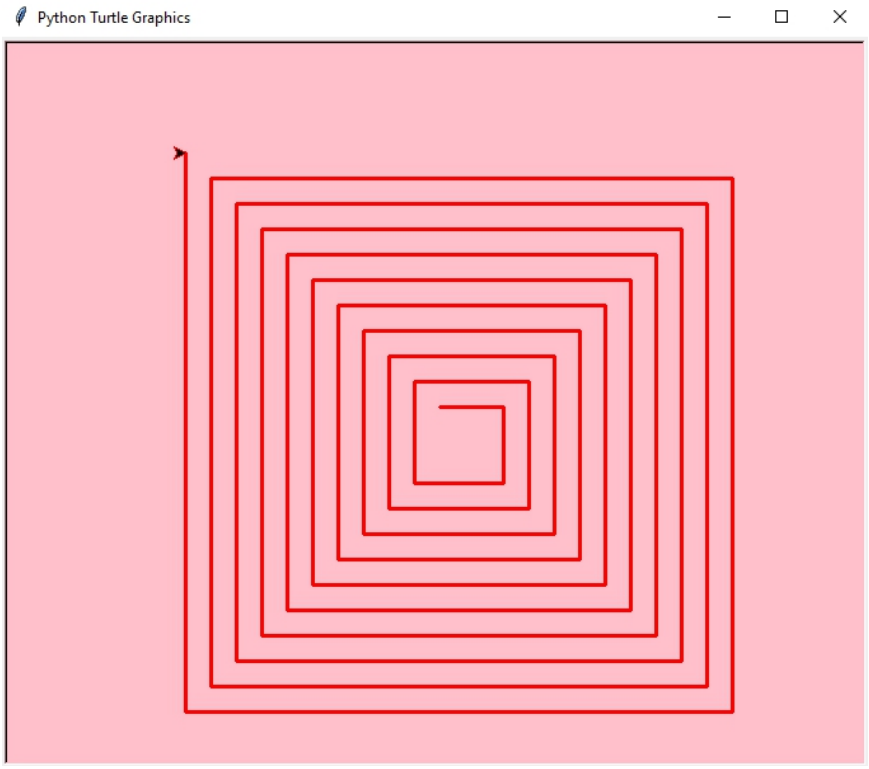
Using voice command drawing a rectangle with a length and breadth as 90,100



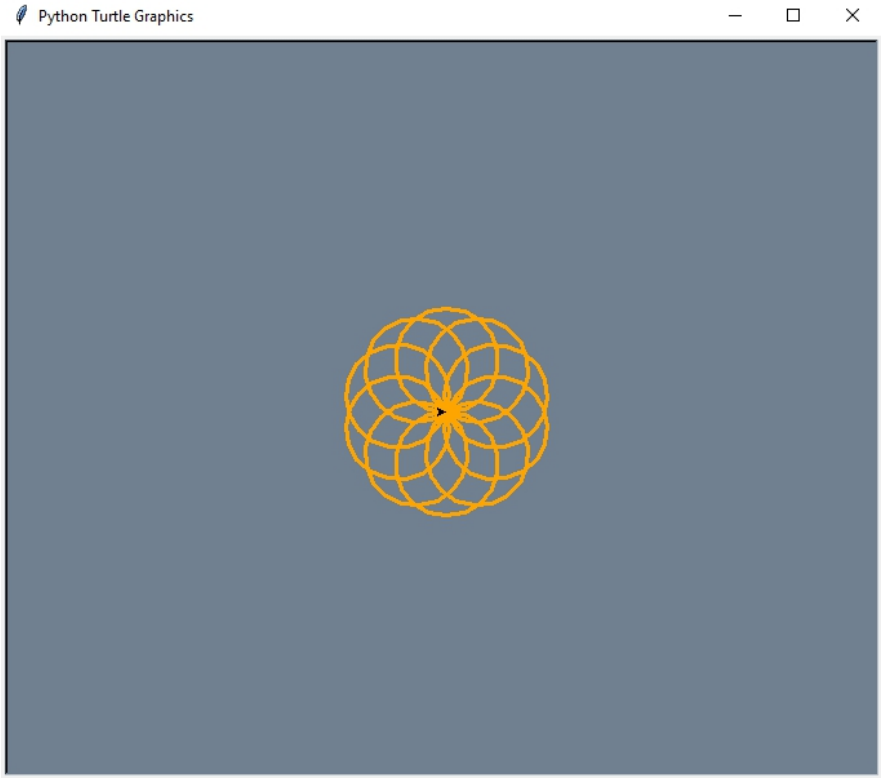
Using voice command drawing an Olympic Rings



Using voice command drawing a Hexagon



Using voice command drawing a Spiral Square



Using voice command drawing a Flower

Using voice command drawing a Rainbow benzene

Critical Evaluations:

Designs and efforts:

- **Project Initiation**-It was the first phase where aspects such as feasibility, value, etc were looked at by our project team.
- **Project Planning**-In this step, we tried to understand the essential activities related to the project.
- **Project Execution**-We has divided our work into two parts like implementing the code in the backend and displaying them on the web which is the front-end.

Mistakes Done:

- PyAudio was not successfully installed in our systems. Because of that, it was very difficult to accept our voice commands.

- All the web commands were by default opening in Internet Explorer for which we provided solutions to open that in Google Chrome.
- Because of the noise present in the surrounding voice command was not taken properly.

Key Learning:

Speech recognition(speech to text): To convert speech to text the one and only class we need is the Recognizer class from the speech_recognition module.

Implementation of A star search: A* algorithm means that the algorithm is admissible, i.e. it is guaranteed that it finds the shortest path in the graph if this path exists.

Text to speech(Pyttsx3): pyttsx3 is a text-to-speech conversion library in Python.

Demonstration of Resolution theorem: Resolution is used, if various statements are given, and we need to prove a conclusion of those statements. Unification is a key concept in proofs by resolutions. Resolution is a single inference rule which can efficiently operate on the conjunctive normal form or clausal form.

Opening any directory or applications using OS module: The OS module in Python provides functions for interacting with the operating system. OS comes under Python's standard utility modules. This module provides a portable way of using operating system-dependent functionality.

Fetching data from Wikipedia: The following commands help to extract information from Wikipedia. The wikipedia.summary() function takes two arguments, the statement given by the user and how many sentences from Wikipedia is needed to be extracted are stored in a variable result.

Sending emails using voice commands with the smtplib module: The web browser extracts data from web. The open_new_tab function accepts URL as a parameter that needs to be accessed. The Python time sleep function is used to add delay in the execution of a program. We can use this function to halt the execution of the program for the given time in seconds.

Final Deliverables:

- **At the end of our project, we have successfully implemented:**
  - Searching something on Wikipedia
  - Opening YouTube site in the browser
  - Opening Google site in the browser
  - Playing music
  - Showing the current time
  - Opening VS Code Program
  - Sending an Email
  - Showing the example of the resolution theorem
  - Draw various figures
  - Show an optimal path according to the A* search algorithm.

Future Works:

1) Our project is based on one language which means our voice assistance is able to communicate in the English language only. some person(s) could try it for multiple languages also which will be the higher version of this project.

2) The other variation of this project is that if we are able to implement a Bluetooth module or something like this then that project is able to handle any Bluetooth device.

3) The project can be implemented for multiple languages like Hindi.

4) We can control smart home devices using voice commands.

5) Voice commands can be used to play games.

6) Voice commands can also be used to check traffic on the road.

7) The Voice of an individual can be used to detect the mood of a person.

Reference Link:

Link 1:
https://www.javatpoint.com/ai-resolution-in-first-order-logic#:~:text=Resolution%20is%20a%20theorem%20proving,Robinson%20in%20the%20year%201965.&text=Resolution%20is%20a%20single%20inference,normal%20form%20or%20clausal%20form.
Link 2: http://ccg.doc.gold.ac.uk/ccg_old/teaching/artificial_intelligence/lecture9.html
Link3:https://towardsdatascience.com/how-to-build-your-own-ai-personal-assistant-using-python-f57247b4494b
Link 4: For speech recognition: from the last start with Recognition of Spoken Words https://www.tutorialspoint.com/artificial_intelligence_with_python/artificial_intelligence_with_python_speech_recognition.htm
Link 5: For Wikipedia: https://pypi.org/project/wikipedia/
Link 6: For DateTime: https://www.w3schools.com/python/python_datetime.asp
Link 7: How to make Python speak: 6th answer
https://stackoverflow.com/questions/1614059/how-to-make-python-speak
Link 8: Turtle graphics: https://docs.python.org/3/library/turtle.html