

## **PHASE 3: COMMUNICATION AND FUTURE EXPLORATION**

### **1. ABSTRACT:**

Tara stands as a groundbreaking AI assistant meticulously crafted to elevate daily productivity through seamless voice interaction and automation. At its core, Tara harnesses cutting-edge AI technologies and Python libraries to execute an extensive array of tasks. These encompass managing emails, navigating the web, system administration, and delivering real-time updates on weather, news, and beyond. By exemplifying how AI can seamlessly integrate into everyday life, this project demonstrates the potential of Tara as a reliable, efficient, and indispensable personal assistant.

`pyttsx3` falls under the category of Natural Language Processing (NLP) in the broader field of Artificial Intelligence (AI).

Natural Language Processing involves the interaction between computers and human (natural) languages. In the case of `pyttsx3`, it is specifically concerned with the generation of human-like speech from text. This process typically involves the use of machine learning algorithms and linguistic rules to convert written text into spoken words, mimicking the way humans speak.

Within NLP, text-to-speech (TTS) conversion is an important area that enables various applications such as virtual assistants, accessibility tools for visually impaired individuals, language learning platforms, and more.

So, while `pyttsx3` itself is not an AI algorithm, it provides a useful tool for developers working in the field of NLP to incorporate speech synthesis capabilities into their AI applications.

### **2. ARTIFICIAL INTELLIGENCE IN AI\_ASSISTANT:**

`AI_ASSISTANT` utilizes cutting-edge artificial intelligence techniques to provide a seamless user experience. Leveraging natural language processing (NLP), speech recognition, and machine learning, `AI_ASSISTANT` can understand and respond to user queries in real-time. Its core functionalities include voice interaction, task automation, information retrieval, and personalized user support. By continuously learning from user interactions, `AI_ASSISTANT` improves its accuracy and efficiency over time.

### 3. FRAMEWORK FOR AI\_ASSISTANT:

The framework for AI\_ASSISTANT is designed to be modular and scalable, consisting of several key components:

- **Voice Processing Module:** Handles speech recognition and synthesis using the pytsx3 and speech\_recognition libraries.
- **Task Automation Module:** Automates routine tasks such as taking screenshots, monitoring CPU usage, and fetching the weather.
- **Information Retrieval Module:** Integrates with APIs to provide real-time information like news updates and Wikipedia summaries.
- **User Interface Module:** Provides a graphical interface using tkinter, allowing users to interact with the assistant via text input or voice commands.

### 4. SYSTEMATIC MODEL:

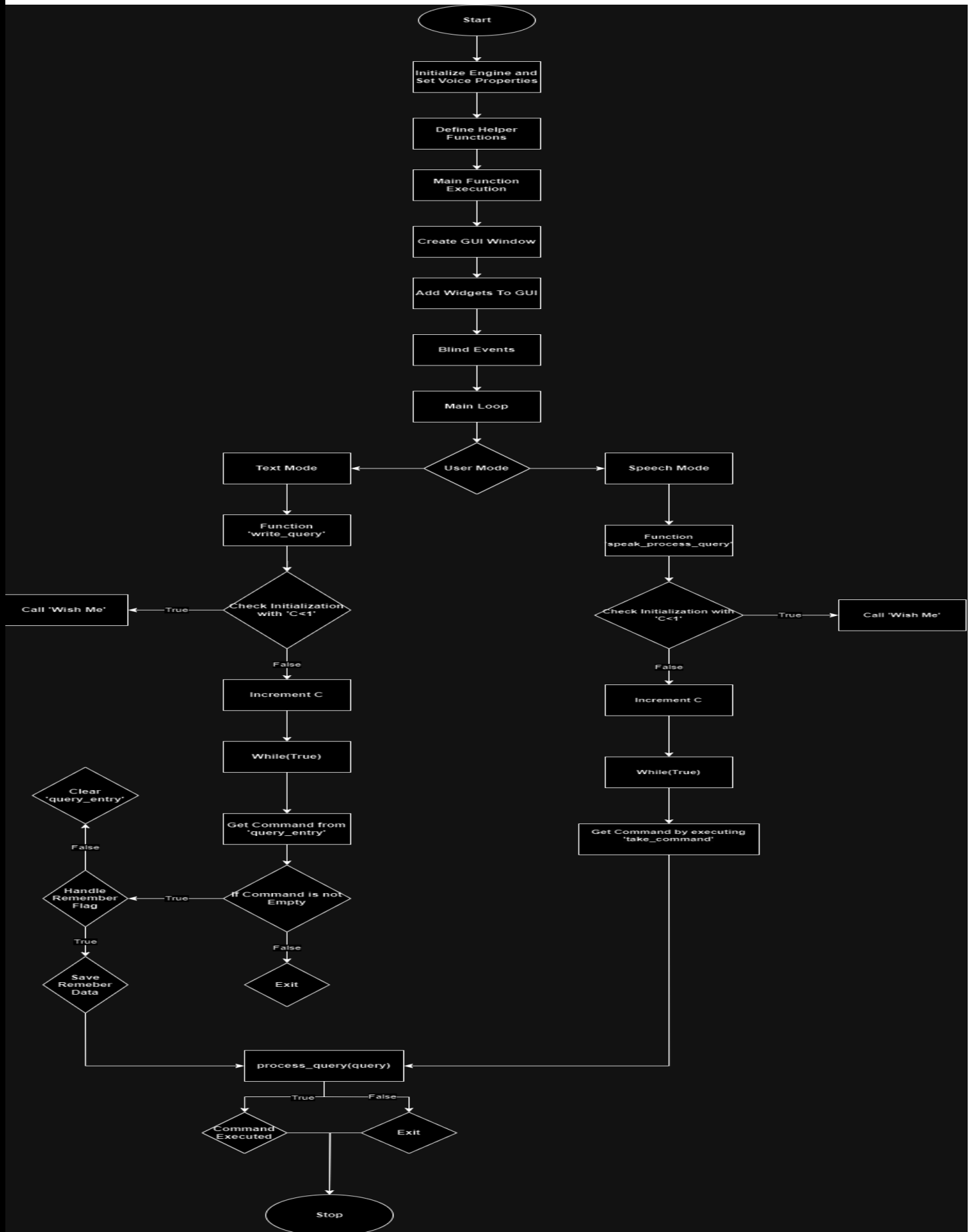
The systematic model for AI\_ASSISTANT involves the following steps:

1. **Initialization:** Set up the speech engine and voice properties.
2. **Greeting:** The assistant greets the user based on the time of day.
3. **Listening:** The assistant listens for voice commands or accepts text input.
4. **Processing:** The assistant processes the user's query and determines the appropriate action.
5. **Execution:** The assistant executes the command, such as fetching information, performing a task, or providing a response.
6. **Feedback:** The assistant provides feedback to the user through speech or text, ensuring a responsive interaction.

### 5. Hardware Requirements:

- **Processor:** Intel Core i5 or equivalent
- **RAM:** Minimum 4 GB (8 GB recommended)
- **Storage:** At least 500 MB of free disk space
- **Microphone:** For voice command input
- **Speakers:** For audio output

## 6.FLOWCHART:



## 7. Software Requirements:

- **Operating System:** Windows 10 or later
- **Python:** Version 3.7 or later
- **Internet Connection:** Required for web-based functionalities like email, weather updates, and news retrieval.

## 8. Tools and Versions:

- **Python:** Version 3.7+
- **pyttsx3:** 2.90
- **datetime:** Standard Python library
- **speech\_recognition:** 3.8.1
- **wikipedia:** 1.4.0
- **smtplib:** Standard Python library
- **webbrowser:** Standard Python library
- **os:** Standard Python library
- **pyautogui:** 0.9.53
- **psutil:** 5.9.0
- **pyjokes:** 0.6.0
- **requests:** 2.25.1
- **json:** Standard Python library

## CODE IMPLEMENTATION:

```
import pyttsx3
import datetime
import speech_recognition as sr
import wikipedia
import webbrowser as wb
import os
import pyautogui
import psutil
import pyjokes
import requests
import json
from tkinter import scrolledtext, filedialog
import tkinter as tk
from tkinter import scrolledtext
```

```

from PIL import Image, ImageTk
import threading
engine = pyttsx3.init()
newVoiceRate = 130
engine.setProperty('rate', newVoiceRate)
voices = engine.getProperty('voices')
engine.setProperty('voice', voices[1].id)

def wishme():
    hour = datetime.datetime.now().hour
    if hour >= 0 and hour < 12:
        speak_and_append("Good Morning Sir")
    elif hour >= 12 and hour < 18:
        speak_and_append("Good Afternoon Sir")
    elif hour >= 18 and hour < 24:
        speak_and_append("Good Evening Sir")
    else:
        speak_and_append("Good Night Sir")
    speak_and_append("Tara at your service. Please tell me how can I help you?")

def screenshot():
    file_path = filedialog.asksaveasfilename(defaultextension=".png",
                                             filetypes=[("PNG files", "*.png"), ("All files",
                                             ".*")])
    if file_path:
        img = pyautogui.screenshot()
        img.save(file_path)
        append_output(f"Screenshot saved to {file_path}")

def cpu():
    usage = str(psutil.cpu_percent())
    speak_and_append('CPU is at ' + usage + ' percent')
    battery = psutil.sensors_battery()
    speak_and_append('Battery is at ' + str(battery.percent) + ' percent')

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

def speak_and_append(audio):
    speak(audio)
    append_output(audio)

def time():
    Time = datetime.datetime.now().strftime("%I:%M %p")
    speak_and_append("The current time is " + Time)

def date():
    Date = datetime.datetime.now().strftime("%A, %B %d, %Y")
    speak_and_append("Today's date is " + Date)

def joke():
    joke = pyjokes.get_joke()
    speak_and_append(joke)

def takeCommand():
    r = sr.Recognizer()
    with sr.Microphone() as source:
        append_output("Listening...")
        r.pause_threshold = 1
        audio = r.listen(source)
    try:
        append_output("Recognizing...")
        query = r.recognize_google(audio, language='en-in')
        append_output(f" {query}\n")
    except Exception as e:

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        append_output("Error: " + str(e))
        speak_and_append("Say that again please...")
        return "None"
    return query

def weather(city):
    api_key = "b52c66bcd330f1661de28426f176faac" # Update with your OpenWeatherMap API key
    base_url = "http://api.openweathermap.org/data/2.5/weather?"
    complete_url = base_url + "appid=" + api_key + "&q=" + city
    response = requests.get(complete_url)
    data = response.json()
    if data["cod"] != "404":
        main = data["main"]
        weather_desc = data["weather"][0]["description"]
        temp = main["temp"]
        temp_celsius = temp - 273.15
        result = f"The temperature in {city} is {temp_celsius:.2f} degrees Celsius with {weather_desc}."
        speak_and_append(result)
    else:
        speak_and_append("City not found")

def get_news():
    api_key = "81a16fa94dc54006bd497762913c248a" # Update with your NewsAPI key
    base_url = "https://newsapi.org/v2/top-headlines"
    params = {
        "apiKey": api_key,
        "country": "us",
        "pageSize": 5
    }
    response = requests.get(base_url, params=params)
    if response.status_code == 200:
        news_data = response.json()
        articles = news_data.get("articles", [])
        if articles:
            speak_and_append("Here are the top news headlines")
            for article in articles[:5]:
                title = article["title"]
                description = article["description"]
                news = f"{title}\n{description}\n"
                speak_and_append(news)
        else:
            speak_and_append("No articles found")
    else:
        speak_and_append("Failed to fetch news data")

def process_query(query):
    if 'time' in query:
        time()
    elif 'wikipedia' in query:
        speak_and_append("Searching...")
        query = query.replace("wikipedia", "")
        results = wikipedia.summary(query, sentences=2)
        append_output(results)
        speak(results)
    elif 'date' in query:
        date()
    elif 'offline' in query:
        quit()
    elif 'open in chrome' in query:
        speak_and_append("What should I open?")
        chrome = 'C:/Program Files/Google/Chrome/Application/chrome.exe %s'
        search = takeCommand().lower()
        wb.get(chrome).open_new_tab(search + '.com')
    elif 'search in chrome' in query:

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speak_and_append("What should I search?")
search = takeCommand().lower()
wb.get('windows-default').open_new_tab(f"https://www.google.com/search?q={search}")
elif 'logout' in query:
    os.system("shutdown -l")
elif 'shutdown' in query:
    os.system("shutdown /s /t 1")
elif 'restart' in query:
    os.system("shutdown /r /t 1")
elif 'play songs' in query:
    song_dir = "C:\\Users\\LENOVO\\Music"
    songs = os.listdir(song_dir)
    os.startfile(os.path.join(song_dir, songs[0]))
    speak_and_append("Playing Songs")
elif 'play songs' in query:
    song_dir = "C:\\Users\\LENOVO\\Music"
    songs = os.listdir(song_dir)
    os.startfile(os.path.join(song_dir, songs[0]))
    speak_and_append("Playing Songs")
elif 'remember' in query:
    speak_and_append("What should I remember?")
    data = takeCommand().lower()
    speak_and_append("You told me to remember " + data)
    file_path = filedialog.asksaveasfilename(defaultextension=".txt",
                                              filetypes=[("Text files", "*.txt"), ("All
files", "*.*")])
    if file_path:
        with open(file_path, "w") as remember_file:
            remember_file.write(data)
elif 'do you know' in query:
    file_path = filedialog.askopenfilename(filetypes=[("Text files", "*.txt"), ("All
files", "*.*")])
    if file_path:
        with open(file_path, "r") as remember_file:
            remember_data = remember_file.read()
            speak_and_append("You told me to remember " + remember_data)
elif 'screenshot' in query:
    screenshot()
elif 'cpu' in query:
    cpu()
elif 'joke' in query:
    joke()
elif 'weather' in query:
    speak_and_append("Please tell me the city name")
    city = takeCommand().lower()
    weather(city)
elif 'news' in query:
    get_news()

def start_thread(mode):
    thread = threading.Thread(target=mode)
    thread.start()

def on_enter(event=None):
    mode = mode_var.get()
    if mode == "speech":
        start_thread(speak_process_query)
    elif mode == "text":
        start_thread(write_query)

C = 0

def speak_process_query():
    global C
    if C < 1:

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        wishme()
    C += 1
    while True:
        query = takeCommand().lower()
        process_query(query)

def write_query():
    global C
    if C < 1:
        wishme()
    C += 1
    remember_flag = False
    while True:
        query = query_entry.get().strip().lower()
        if query:
            if remember_flag:
                data = query
                if data:
                    speak_and_append("You told me to remember " + data)
                    file_path = filedialog.asksaveasfilename(defaultextension=".txt",
                                                              filetypes=[("Text files",
                                                                "*.txt"), ("All files", "*.*)])
                    if file_path:
                        with open(file_path, "w") as remember_file:
                            remember_file.write(data)
                        remember_flag = False
                    query_entry.delete(0, tk.END)
                elif 'remember' in query:
                    remember_flag = True
                    speak_and_append("What should I remember?")
                    query_entry.delete(0, tk.END)
            else:
                process_query(query)
                query_entry.delete(0, tk.END)
    root.update()

def append_output(text):
    text_area.insert(tk.END, "Assistant: " + text + "\n")
    text_area.see(tk.END)

if __name__ == "__main__":
    root = tk.Tk()
    root.title("Tara Assistant")
    frame = tk.Frame(root)
    frame.pack(pady=10)
    microphone_image = Image.open("D:\\Mic.png")
    microphone_image = microphone_image.resize((50, 50), Image.LANCZOS)
    microphone_icon = ImageTk.PhotoImage(microphone_image)
    microphone_label = tk.Label(frame, image=microphone_icon)
    microphone_label.pack(side=tk.LEFT, padx=10)
    mode_var = tk.StringVar(value="speech")
    speech_mode_button = tk.Radiobutton(frame, text="Speech Mode", variable=mode_var,
                                         value="speech")
    speech_mode_button.pack(side=tk.LEFT)
    write_mode_button = tk.Radiobutton(frame, text="Write Mode", variable=mode_var,
                                         value="text")
    write_mode_button.pack(side=tk.LEFT)
    query_entry = tk.Entry(frame, width=50)
    query_entry.pack(side=tk.LEFT)
    button = tk.Button(frame, text="Start", command=on_enter)
    button.pack(side=tk.RIGHT, padx=10)
    root.bind("<Return>", on_enter)
    text_area = scrolledtext.ScrolledText(root, height=20, width=80)

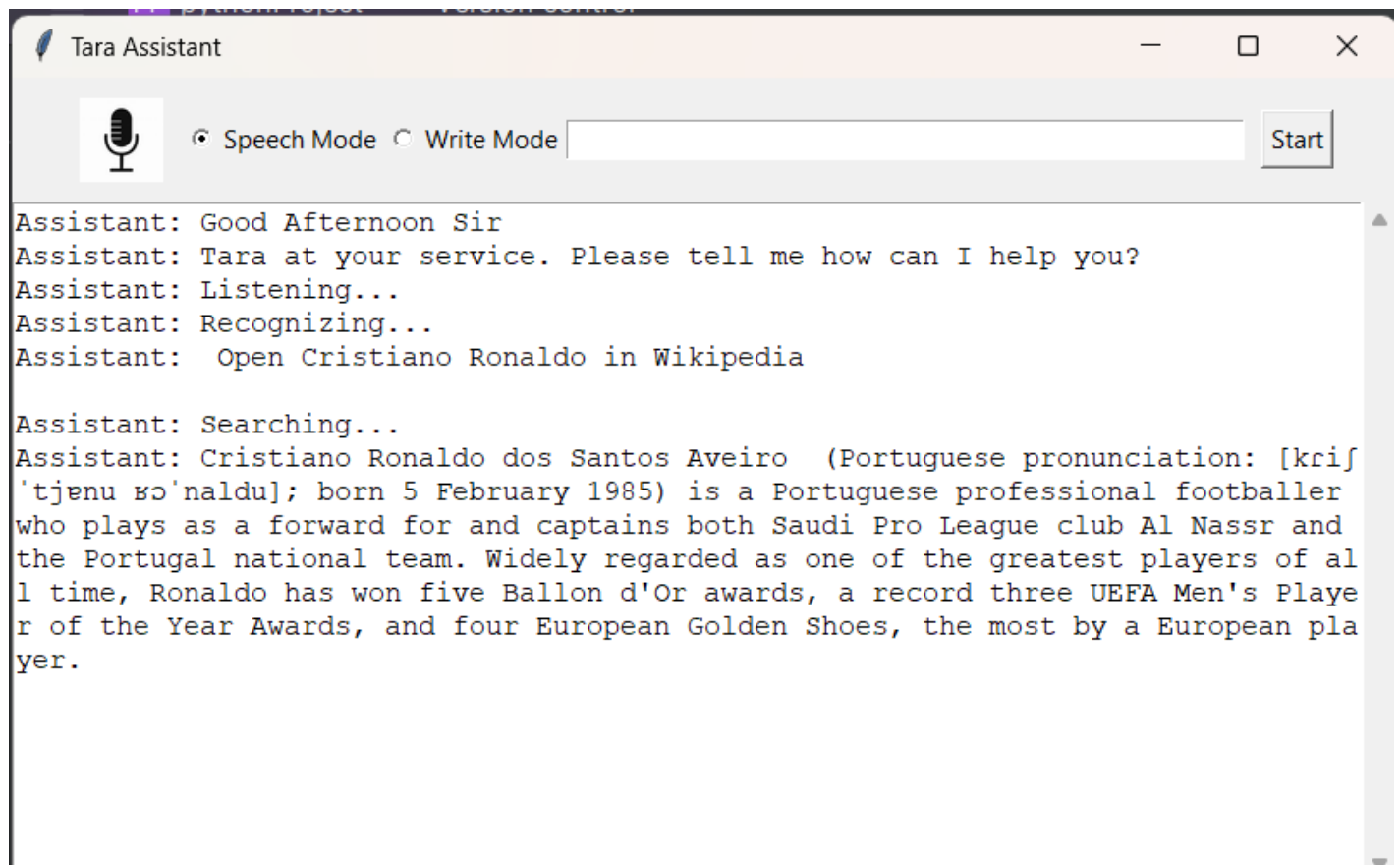
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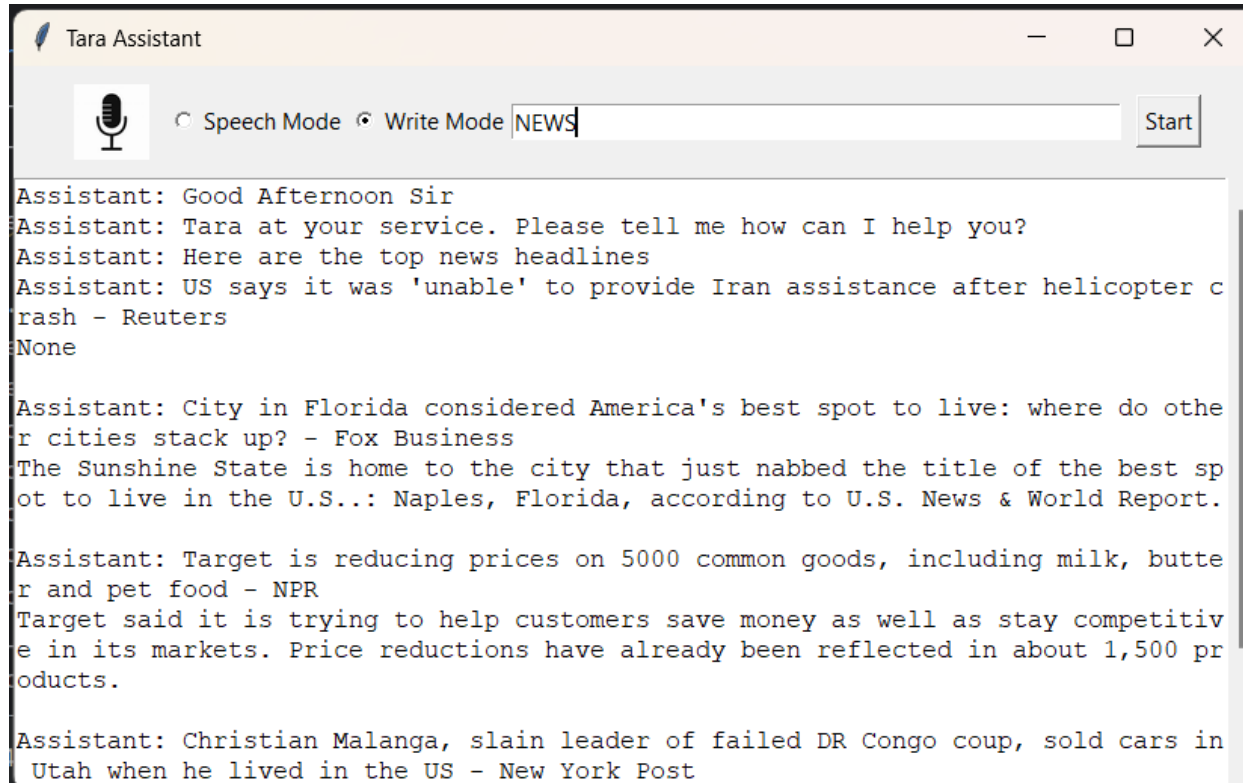
```
text_area.pack()  
root.mainloop()
```

## OUTPUT(SCREEN SHOTS):

### 1.SPEECH MODE:



## 2.WRITE MODE:



## CONCLUSION AND FUTURE SCOPE:

**AI\_ASSISTANT** represents a significant advancement in AI-driven communication and task automation. As AI technology continues to evolve, future improvements can include more sophisticated natural language understanding, integration with more diverse data sources, and enhanced user personalization. Potential future developments also encompass advanced machine learning algorithms for better context awareness and predictive capabilities, making **AI\_ASSISTANT** an even more valuable tool in personal and professional settings.