

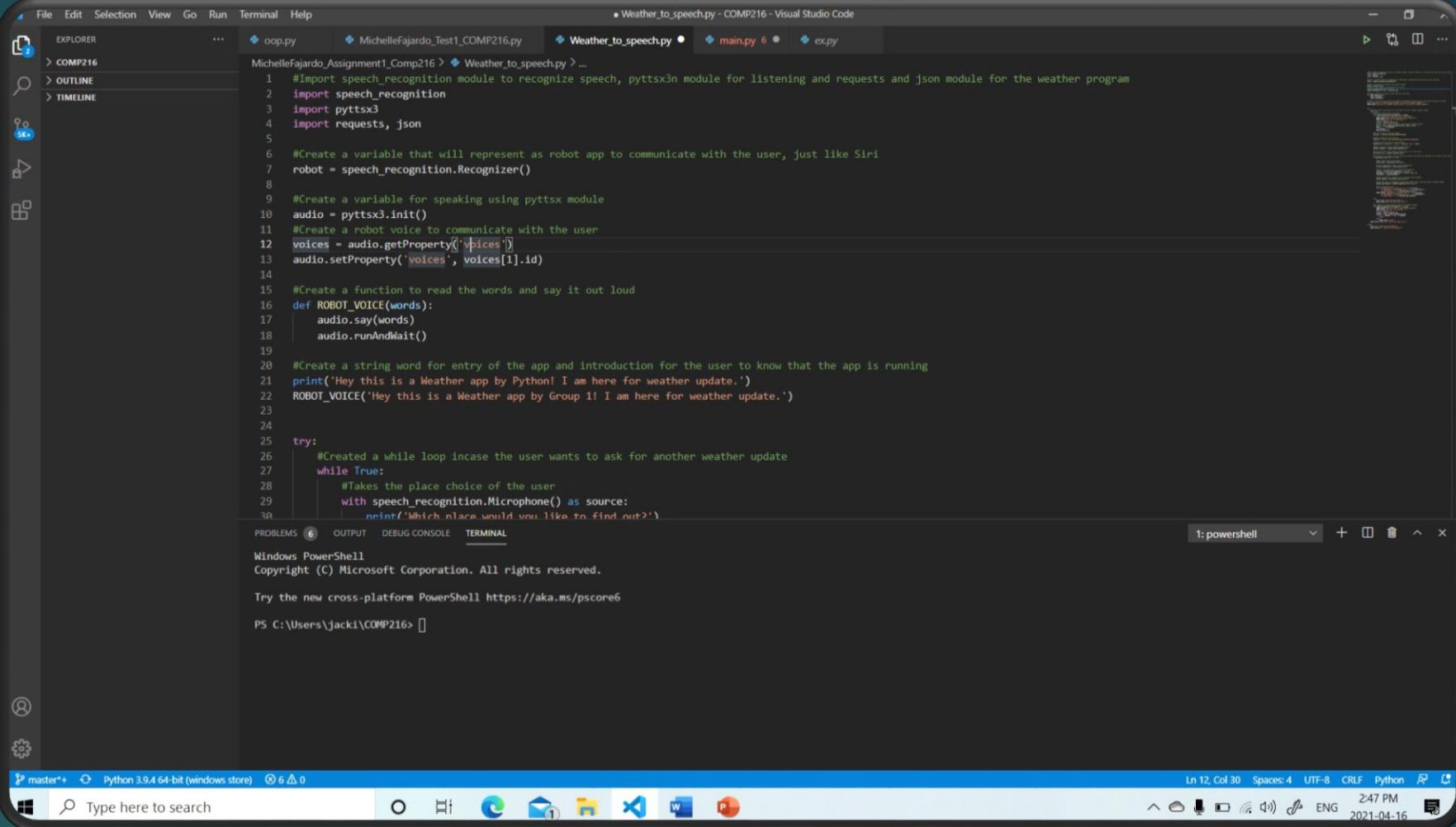


Voice Command Web Scraper

Group 1

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Demonstration on how the code looks like at the beginning of the project



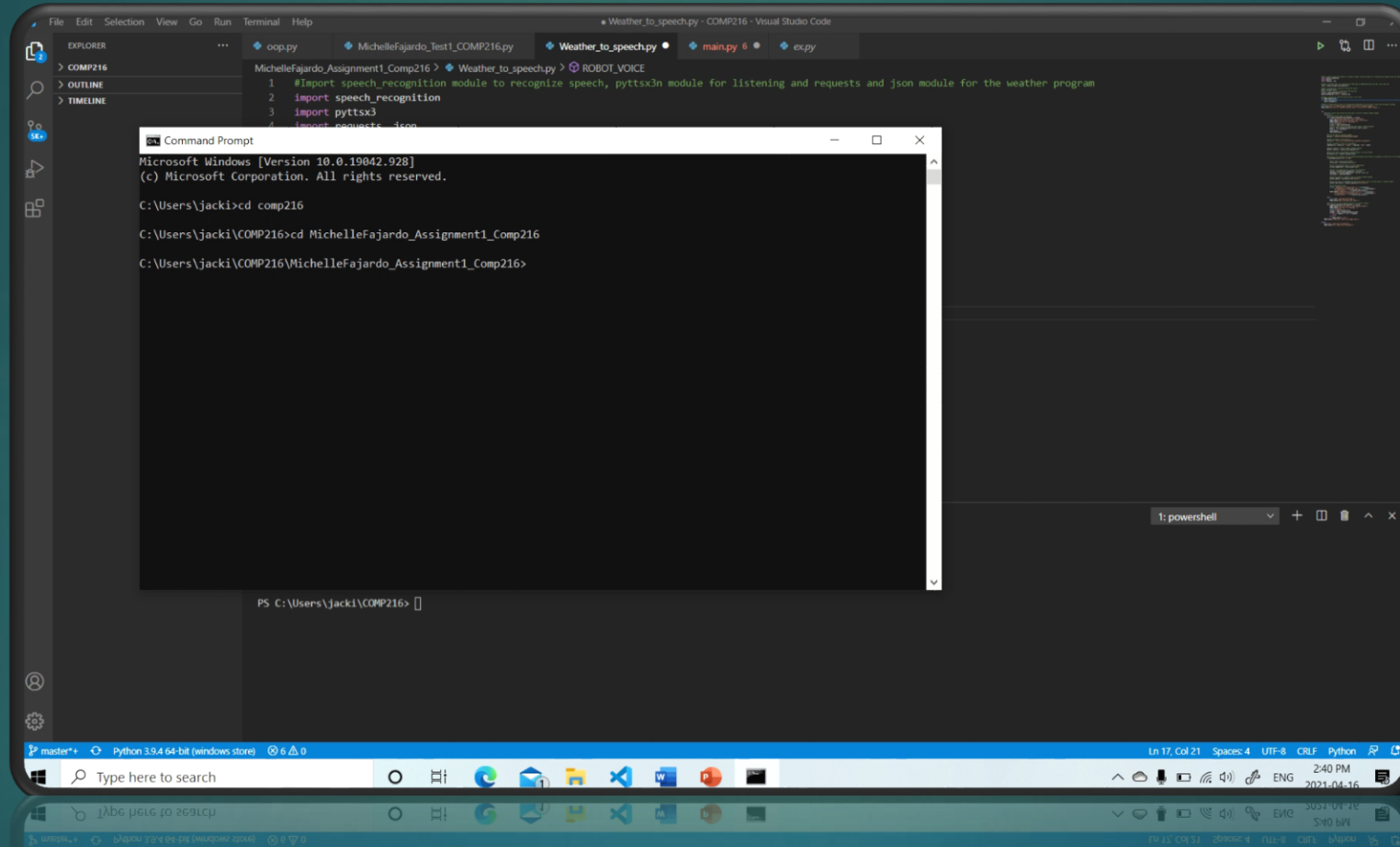
```
1 #Import speech_recognition module to recognize speech, pyttsx3 module for listening and requests and json module for the weather program
2 import speech_recognition
3 import pyttsx3
4 import requests, json
5
6 #Create a variable that will represent as robot app to communicate with the user, just like Siri
7 robot = speech_recognition.Recognizer()
8
9 #Create a variable for speaking using pyttsx module
10 audio = pyttsx3.init()
11 #Create a robot voice to communicate with the user
12 voices = audio.getProperty('voices')
13 audio.setProperty('voices', voices[1].id)
14
15 #Create a function to read the words and say it out loud
16 def ROBOT_VOICE(words):
17     audio.say(words)
18     audio.runAndWait()
19
20 #Create a string word for entry of the app and introduction for the user to know that the app is running
21 print('Hey this is a Weather app by Python! I am here for weather update.')
22 ROBOT_VOICE('Hey this is a Weather app by Group 1! I am here for weather update.')
23
24
25 try:
26     #Created a while loop incase the user wants to ask for another weather update
27     while True:
28         #Takes the place choice of the user
29         with speech_recognition.Microphone() as source:
30             print('Which place would you like to find out?')
```

Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell <https://aka.ms/pscore6>

PS C:\Users\jack1\COMP216>

Demo of the first code



The screenshot shows a Windows desktop environment. In the background, a Visual Studio Code window is open with a file named 'Weather_to_speech.py'. The code in the editor includes comments and imports for speech recognition and weather data retrieval. In the foreground, a Windows Command Prompt window is open, showing the following commands and their output:

```
Microsoft Windows [Version 10.0.19042.928]
(c) Microsoft Corporation. All rights reserved.

C:\Users\jacki>cd comp216

C:\Users\jacki\COMP216>cd MichelleFajardo_Assignment1_Comp216

C:\Users\jacki\COMP216\MichelleFajardo_Assignment1_Comp216>
```

The taskbar at the bottom shows the Windows Start button, a search bar, and several application icons. The system tray on the right indicates the time as 2:40 PM on 2021-04-16.

#I have muted myself at the end to see if it will recognize whether my microphone is not recognized or not.



App Functionality



Weather API



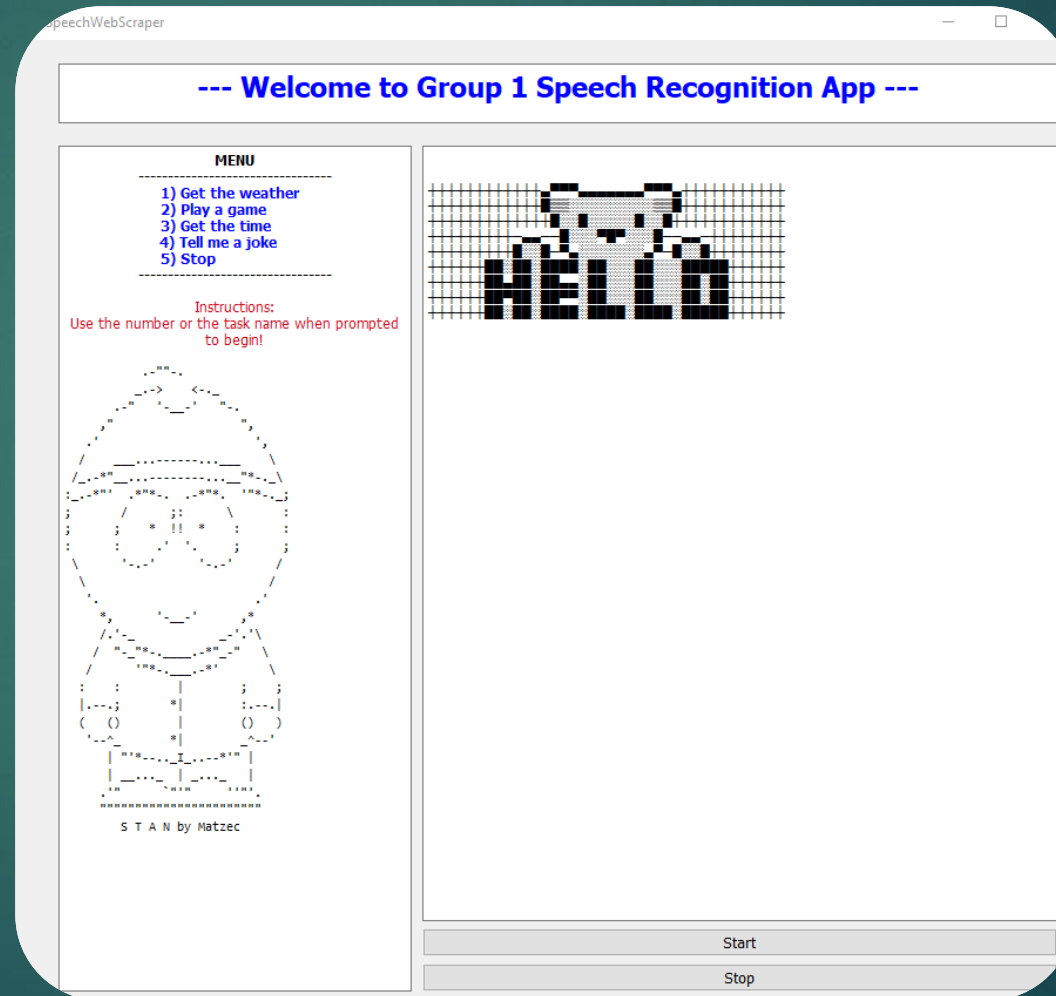
Game



Time



Jokes





MacOS Compatibility



Programmed



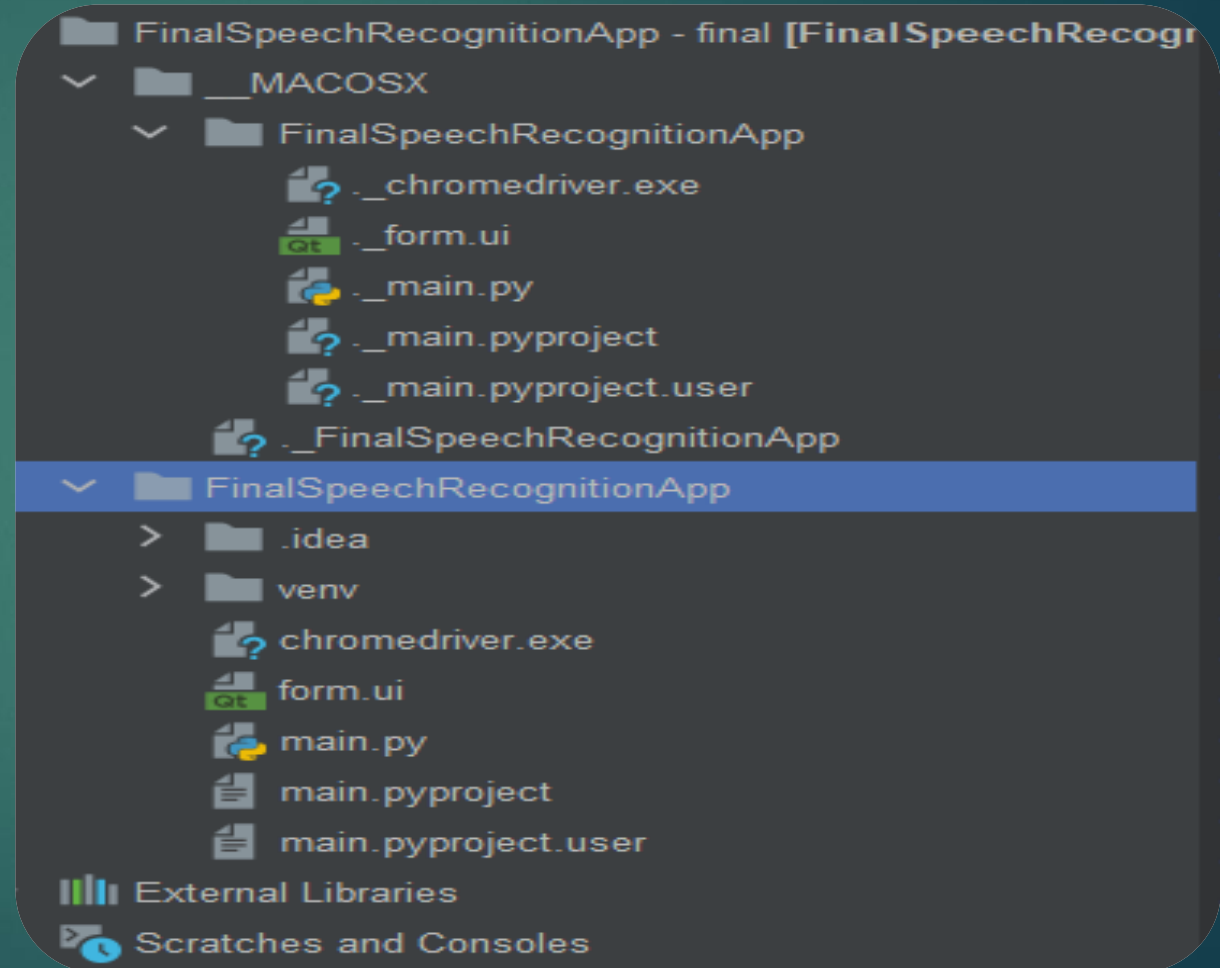
With



MacOS



Compatibility





Demo of the Application including all functionality , displayed in GUI





Main Packages



```
1 import speech_recognition
2 import pyttsx3
3 from selenium import webdriver
4 from bs4 import BeautifulSoup
5 import pycountry
6 import requests
7 import random
8 import sys
9 from PyQt5.QtWidgets import QApplication
10 from PyQt5 import uic
11 import os
```

Speech_Recognition

Pyttsx3

Selenium

BeautifulSoup

Requests

PyQt5

PyAudio



Performing Speech Recognition

SpeechRecognition 3.8.1

`pip install SpeechRecognition`

- ← Library for performing speech recognition, with support for several engines and APIs, online and offline.
- ← **Speech recognition engine/API support:**

Google Speech Recognition

Google Cloud Speech API

Microsoft Bing Voice Recognition





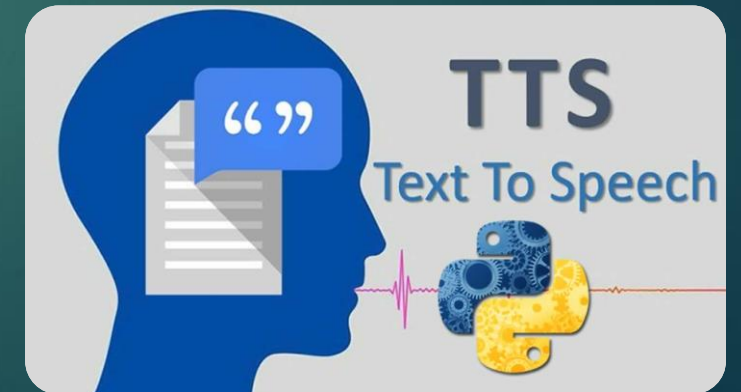
Text to Speech (TTS)

pyttsx3 2.90

```
pip install pyttsx3
```

pyttsx3: text-to-speech conversion library in Python.

- ↴ Pros:, it works offline
- ↴ Compatible with both Python 2 and 3.



Web Scraper



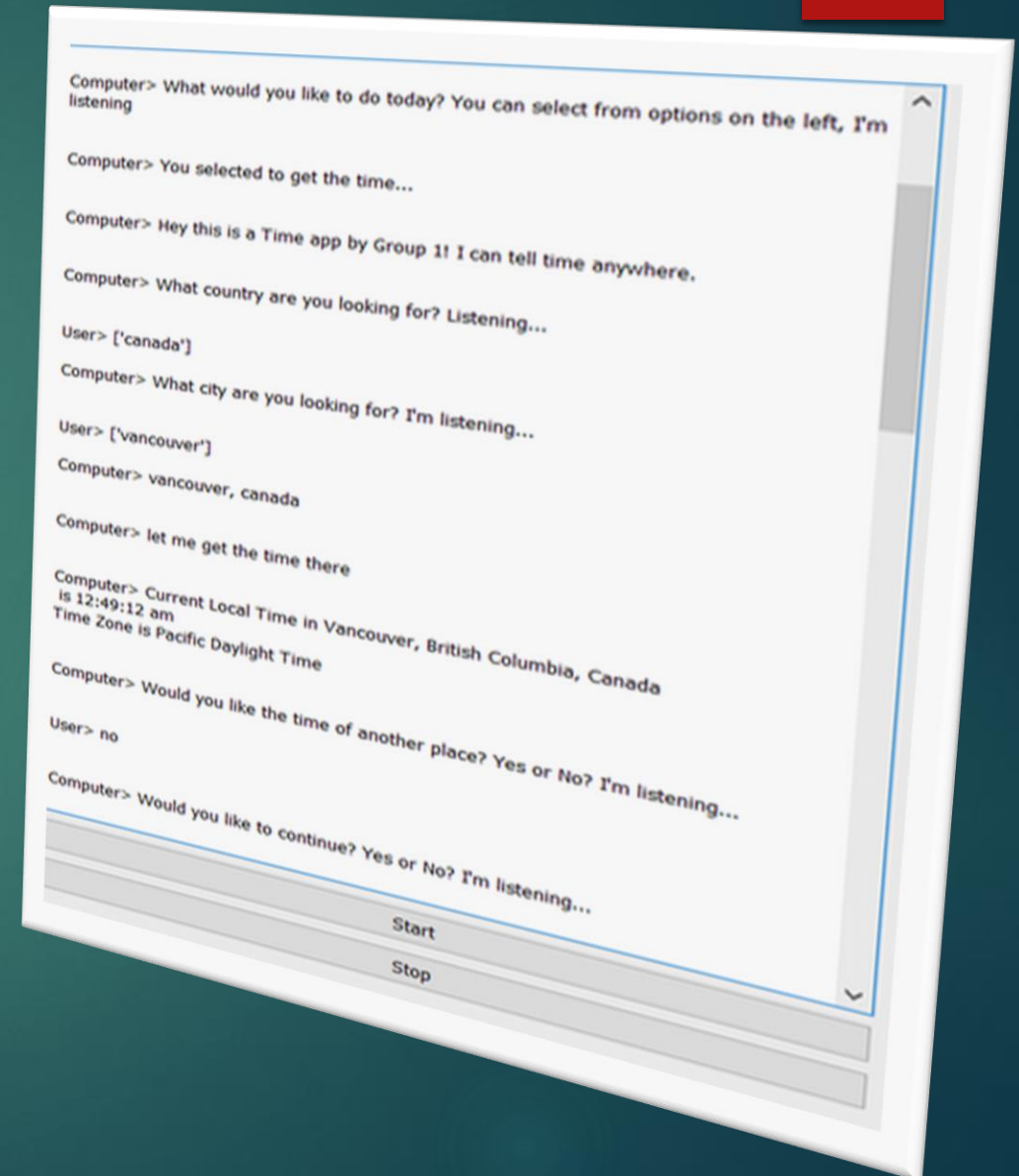
Selenium: Web testing library, Web driver loads web page like a browser would

→ pip install selenium

BeautifulSoup: Python library for extracting data out of HTML & XML

➤ pip install beautifulsoup4

→ Selenium was used to get the dynamic HTML code, which was parsed & searched with BeautifulSoup. Requests library was used for all data requests.



API Calls



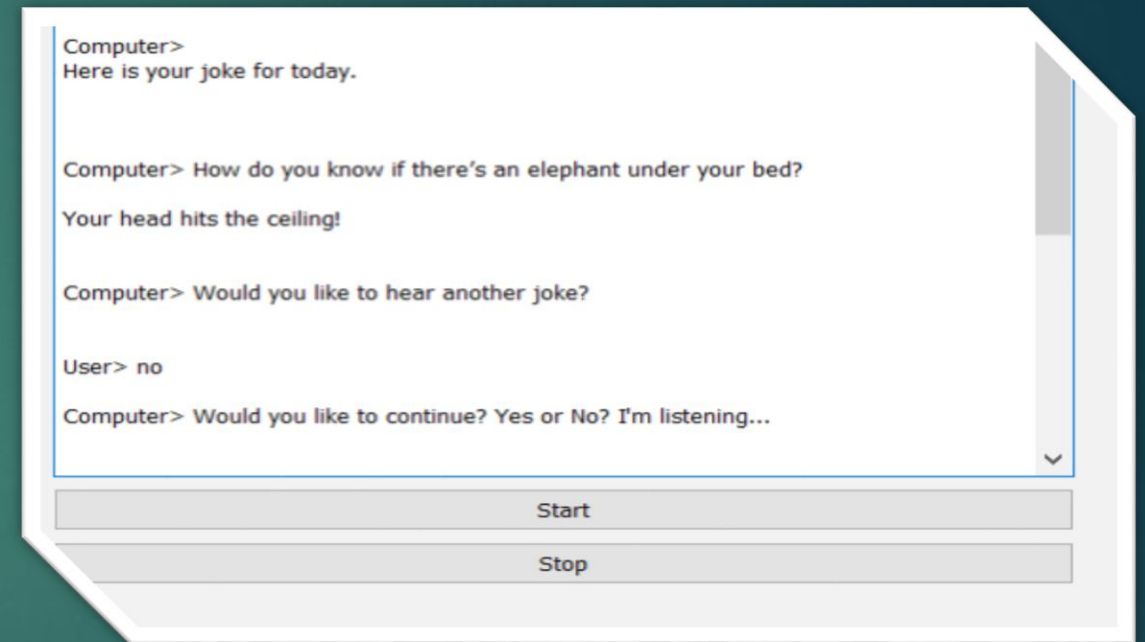
Requests: HTTP library, Send HTTP requests and return a Response Object, Response object easily converted to JSON

→ pip install requests

JSON: Module for working with JSON strings and objects, Python native support, Name/Value pair format

➤ import json

→ Requests are used to make API calls and response is parsed as a JSON object with the JSON module



PyQt5 GUI



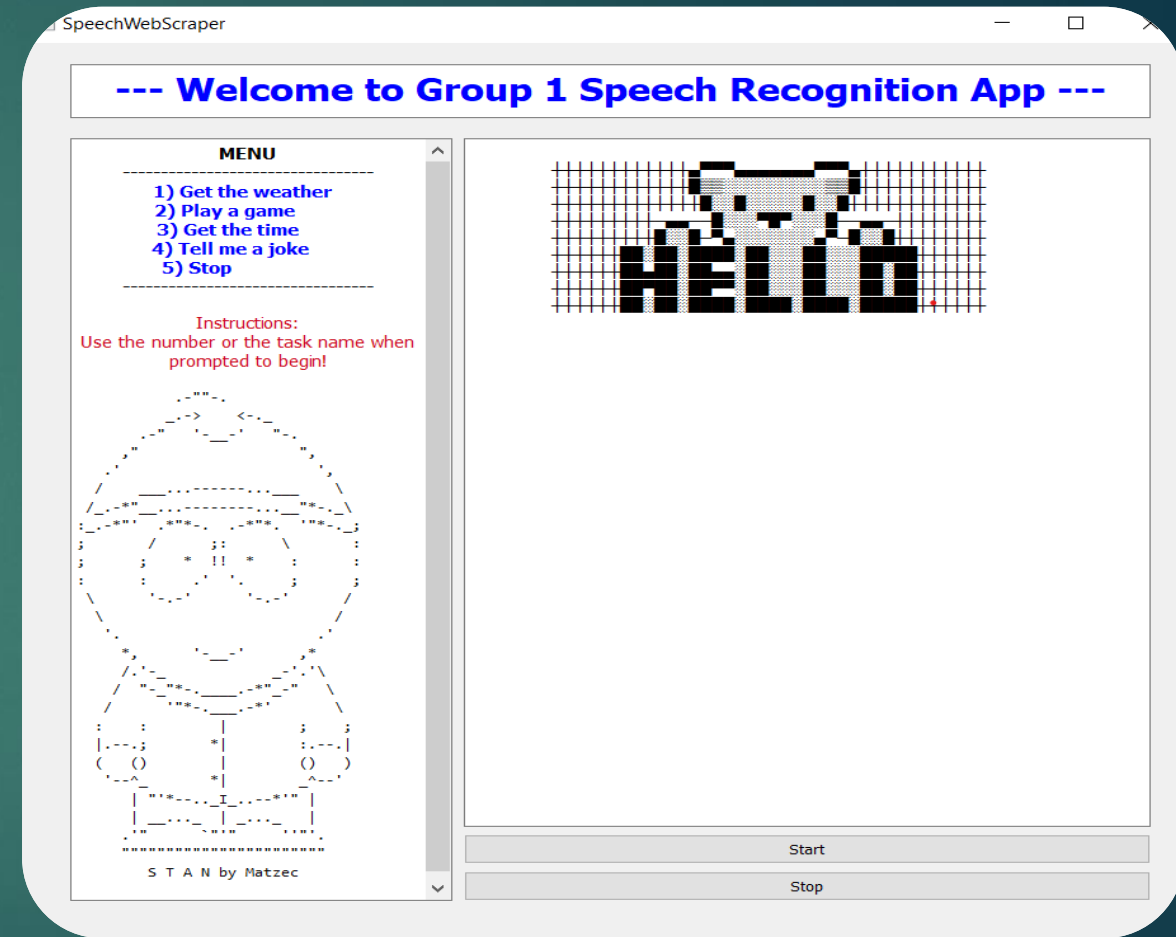
PyQt5: GUI library, Uses Qt framework, Most used GUI building module

→ pip install pyqt5

QtDesigner: Qt tool, Built in to PyQt5 library, Scratch pad for designing applications

➤ Found in Lib folder of Python directory on drive

→ QtDesigner was used to design the application. The output file, a .ui file, was then used in the application code by importing the uic module from PyQt5 library, with the QApplication class



Application Breakdown



SpeechWebScraper class inherits from 2 GUI Classes. The constructor initializes & loads the required components. ROBOT_VOICE method allows for text-to-speech speaking

```
20 class SpeechWebScraper(MainWindowBase, MainWindowUI):
21
22     def __init__(self, parent=None):
23         MainWindowBase.__init__(self, parent)
24
25         self.setupUi(self)
26
27         # Create a variable that will represent as robot app to communicate with the user, just like Siri
28         self.robot = speech_recognition.Recognizer()
29         # Create a variable for speaking using pyttsx module
30         self.audio = pyttsx3.init()
31         # Create a self.robot voice to communicate with the user
32         self.voices = self.audio.getProperty('voices')
33         self.audio.setProperty('voices', self.voices[0].id)
34         self.pushButton_start.clicked.connect(self.menu_selection)
35         self.pushButton_stop.clicked.connect(self.stop_event)
36         self.textBrowser_conversation.append("""
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```




Location_getter: method

Location_getter method uses speech recognition to get user input of city and country and returns them as 2 string variables. Used in the weather and time modules.

```
307 def location_getter(self, source):
308     while True:
309         self.general_display('What country are you looking for? Listening...')
310         # Try condition for invalid country and unrecognized speech exceptions
311         try:
312             listen = self.robot.listen(source)
313             # listen to the voice and take the first word if there are many
314             place = self.robot.recognize_google(listen).lower().split(' ')
315             country = '-'.join(place)
316             self.textBrowser_conversation.append(f"\nUser> {place}")
317             # If statement validates input country with pycountry module
318             if pycountry.countries.search_fuzzy(country):
319                 # Url takes america as usa, so this if condition check for that
320                 if pycountry.countries.search_fuzzy(country) == pycountry.countries.search_fuzzy("America"):
321                     country = "usa"
322                 break
323             else:
324                 # Raise error if country is not validated
325                 raise LookupError
326         except LookupError or AttributeError:
327             # Raised if country not validated
328             self.general_display("Invalid Country")
329         except speech_recognition.UnknownValueError:
330             # Raised if speech not recognized
331             self.general_display("Please Say a Country")
332     # Get city from the user
333     while True:
334         self.general_display("What city are you looking for? I'm listening...")
335         # Try condition for invalid city and unrecognized speech exceptions
336         try:
337             listen = self.robot.listen(source)
338             # listen to the voice and take the first word if there are many
339             place = self.robot.recognize_google(listen).lower().split(' ')
340             self.textBrowser_conversation.append(f"\nUser> {place}")
341             city = '-'.join(place)
342             self.general_display(city + ", " + country)
343             break
344         except:
345             # Raised if speech not recognized
346             self.general_display("Please Say a City")
347
348     return country, city
349
```



Time_scraper: method – Scrapes the given website using BeautifulSoup and requests.

BeautifulSoup parses the webpage's code to extract the information we need. Only works on webpages which are not loaded with dynamic code. Implemented with location_getter method in the time module.

```
83
84 # Method to statically web scrape time from user input of country & city
85 def time_scraper(self, country: str, city: str):
86     # Create variable to store url with country and city appended which will be opened
87     URL = 'https://www.timeanddate.com/worldclock/' + country + '/' + city
88     # Request gets page's full code
89     page = requests.get(URL)
90     # Variable creates a soup object based on source code in analyzable format
91     soup = BeautifulSoup(page.content, features="lxml")
92     # Web page's title was a good format so I grabbed it as is
93     title = soup.title.text.strip()
94     # Variables to store extracted weather details
95     time = soup.find(id='ct').text.strip()
96     time_zone = soup.find(id='cta').find('a')['title']
97     return f'{title}\n is {time}\nTime Zone is {time_zone}'
98
```

Weather_scraper: method - dynamically scrapes the given website using requests, Selenium and BeautifulSoup



Selenium loads the full pages code and BeautifulSoup parses the webpage's code to extract the information we need.

```
2 # Create function to scrape weather data from the web, takes country & city parameters & returns forecast as str
53 def weather_scraper(self, country: str, city: str):
54     # Variable holds path to webdriver for selenium use
55     PATH = "./chromedriver.exe"
56     # Create variable to store url with country and city appended which will be opened
57     URL = 'https://www.timeanddate.com/weather/' + country + '/' + city
58     # Option variable to pass driver object to suppress the opening of the browser
59     option = webdriver.ChromeOptions()
60     option.add_argument('headless')
61     # Variable represents Chrome browser
62     driver = webdriver.Chrome(PATH, options=option)
63     # Webdriver opens url
64     driver.get(URL)
65     # Page loads generates full code, source code is then stored as a variable
66     soup_source = driver.page_source
67     # Variable creates a soup object based on source code in analyzable format
68     soup = BeautifulSoup(soup_source, features="lxml")
69     # Webdriver closed as beautifulsoup will process remaining code
70     driver.quit()
71     # Web page's title was a good format so I grabbed it as is
72     title = soup.title.text.strip()
73     # Element id of HTML code block needed to analyze
74     focus = soup.find(id='qlook')
75     # Variables to store extracted weather details
76     temp = focus.find('div', class_='h2').text.strip()
77     rest_info = focus.find_all('p')
78     condition = rest_info[0].text.strip()
79     description = rest_info[1].text.strip().split('F')
80     # Create a formatted string variable to return forecast in speakable form
81     feels = 'F' + description[1]
82     return f'{title}\n {temp}\nCondition is {condition}\n {feels}'
```

Joke Module: method – Uses API request to get joke



Joke Module gets a random joke from an open-source joke API. The request library is used to get the joke and punchline, while json library is used to parse, process and display the joke and punchline.

```
187 def joke_module(self, source):
188     self.continueJoke = True
189     while self.continueJoke:
190         response = requests.get("https://official-joke-api.appspot.com/random_joke").json()
191         self.general_display(f"\nHere is your joke for today.\n")
192         joke = f"{response['setup']} \n\n{response['punchline']}"
193         self.general_display(joke)
194         self.general_display("Would you like to hear another joke?")
195         listen = self.robot.listen(source)
196         command = self.robot.recognize_google(listen)
197         if "no" in command or "exit" in command or "stop" in command or 'nope' in command or '5' in command \
198             or 'five' in command or 'nop' in command or 'cancel' in command or 'end' in command:
199             self.continueJoke = False
200             self.textBrowser_conversation.append(f"\nUser> {command}")
```

Game Module: method – Simple guess-the-random-number game



Game Module is a simple guess-the-randomly-generated-number game within the allotted attempts and integrates taking of user speech from speech recognition.

```
def game_module(self, source):
    while True:
        num_guess = 0
        number = random.randint(1, 20) # returns random integer within range
        # print the number so you can see it
        print(number)
        self.general_display('I am thinking of a number between 1 and 20.')
        self.general_display("How many attempts would you like to guess the number? I'm listening ...")
        listen = self.robot.listen(source)
        attempts = self.robot.recognize_google(listen)
        attempts = int(attempts)
        self.textBrowser_conversation.append(f'\nUser> {attempts}')
        guess = 0
        while num_guess < attempts:
            try:
                self.general_display("Guess a number. I'm listening ")
                listen = self.robot.listen(source)
                guess = self.robot.recognize_google(listen)
                guess = int(guess)
                self.textBrowser_conversation.append(f'\nUser> {guess}')
                num_guess += 1
                if guess < number:
                    self.general_display('Your guess is too low.')
                if guess > number:
                    self.general_display('Your guess is too high.')
                if guess == number:
                    self.win_msg(num_guess)
                    break
            except:
                # Generic exception block w/o error type catch all errors & mic speech_recognition errors
                self.general_display("Something went Wrong. Please try again!")
        if guess != number:
            number = str(number)
            self.lose_msg(number)
        # Ask the user to continue checking other locations for weather updates
        self.general_display("Would you like to play another round? Yes or No? I'm listening...")
        try:
            listen = self.robot.listen(source)
            command = self.robot.recognize_google(listen)
            if "no" in command or "exit" in command or "stop" in command or 'nop' in command or 'cancel' in command or 'end' in command:
                self.textBrowser_conversation.append(f'\nUser> {command}\n')
                break
            else:
                self.general_display('I see!')
                self.general_display(f'I see! {command}')
        except:
            pass
```


Menu_selection : method - Application loop allows operation of multiple modules in a single run



Menu_selection method allows the user to select the function they would like to use and opens the corresponding module. Method loop will ask the user to continue exploring functionality or exit loop and end app.

```
def menu_selection(self):
    self.general_display("What would you like to do today? You can select from options on the left, I'm listening")
    try:
        with speech_recognition.Microphone() as source:
            while self.continueLoop:
                listen = self.robot.listen(source)
                command = self.robot.recognize_google(listen)
                if "no" in command or "exit" in command or "stop" in command or 'nope' in command or '5' in command or 'five' in command or 'nop' in command or 'cancel' in command or 'end' in command:
                    self.continueLoop = False
                    self.textBrowser_conversation.append(f"\nUser> {command}")
                    self.exit_msg()
                elif "weather" in command or "get the weather" in command or "1" in command or "one" in command:
                    self.continueLoop = True
                    self.general_display("You selected to get the weather...")
                    self.weather_module()
                elif "time" in command or "get the time" in command or "3" in command or "three" in command:
                    self.continueLoop = True
                    self.general_display("You selected to get the time...")
                    self.time_module()
                elif "game" in command or "play a game" in command or "play" in command or "2" in command or "two" in command:
                    self.continueLoop = True
                    self.general_display("You selected to play a game...")
                    self.game_module(source)
                elif "joke" in command or "tell me a joke" in command or "please tell me a joke" in command or "4" in command or "four" in command:
                    self.joke_module(source)
                else:
                    self.continueLoop = True
                    self.general_display('I did not understand so I will tell you a joke!')
                    self.joke_module()
            self.stop_event2()
    except:
        # Generic exception block without error type catches all unspecified errors and mic speech recognition errors
        self.err_msg()
```


Adding more Features



```
247 def stop_event2(self):
248     # self.stop_event2()
249     self.general_display("Would you like to continue? Yes or No? I'm listening...")
250     try:
251         with speech_recognition.Microphone() as source:
252             listen = self.robot.listen(source)
253             command = self.robot.recognize_google(listen)
254             if "no" in command or "exit" in command or "stop" in command or 'nop' in command or 'cancel' in command or 'end' in command:
255                 self.continueLoop = False
256                 self.textBrowser_conversation.append(f"\nUser> {command}")
257                 # Closing message
258                 self.exit_msg()
259             else:
260                 self.continueLoop = True
261                 self.general_display("Let's continue! You can select from options on the left, I'm listening")
262     except:
263         # Generic exception block w/o error type catches all unspecified errors and mic speech_recognition errors
264         self.err_msg()
265
266 def stop_event(self):
267     if self.continueLoop:
268         self.continueLoop = False
```

```
def win_msg(self, num_guess):
    self.general_display("Good job! You guessed my number is " + str(num_guess) + " (bravo)")
    self.textBrowser_conversation.append("")

def lose_msg(self, number):
    self.general_display("Sorry, you ran out of attempts. I was thinking of the number " + number)
    self.textBrowser_conversation.append("")

def err_msg(self):
    self.general_display("Error: I didn't understand that. Please try again.")
    self.textBrowser_conversation.append("")
```

```
350 def general_display(self, msg: str):
351     # Since forecast results have successfully been returned say forecast and break loop
352     self.textBrowser_conversation.append(f"\nComputer> {msg}\n")
353     self.ROBOT_VOICE(msg)
354     # print(msg)
355
356 def exit_msg(self):
357     # Closing message
358     self.general_display('Thank you. Talk to you again soon!')
359     self.textBrowser_conversation.append(f"")
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```



Thanks
For
Watching!

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