

Python JARVIS Speech Recognition

Contents

Python JARVIS Speech Recognition	1
The JARVIS Project.....	1
Wikipedia	1
Tutorial Part 1.....	2
Tutorial Part 2.....	3
Assignment: The JARVIS Project	5
Troubleshooting the Microphone.....	6
Flowchart	7
Assignment Submission.....	8

Time required: 90 minutes

This series of tutorials were inspired by

<https://www.freecodecamp.org/news/python-project-how-to-build-your-own-jarvis-using-python/>

NOTE: You may need to run this program from the command line or IDLE for it to work.

The JARVIS Project

Please create a JARVIS repository in your GitHub account.

Wikipedia

As part of saving the universe, there are times we need to do research. What type of food do the aliens eat, are they immune to our germs, etc.

The Python Wikipedia library allows us to access information from Wikipedia. This is an older library which still works.

<https://pypi.org/project/wikipedia/>

1. Go to a command prompt → **pip install wikipedia**

Tutorial Part 1

With all the JARVIS tutorials, we will start from the bare bones, and build to an OOP version. We are going to start with a simple Wikipedia program.

Code

```
1  """
2      Name: wikipedia_1.py
3      Author:
4      Created:
5      Purpose:
6  """
7
8  # pip install wikipedia
9  import wikipedia
10
11 # Type in your search term
12 search_terms = input("Search Wikipedia: ")
13
14 # Return a summary result of 3 sentences
15 summary = wikipedia.summary(search_terms, sentences=3)
16
17 # Print result
18 print(summary)
```

Example run:

User fairly specific search terms, at least two or three words.

```
Search Wikipedia: Python programming
Python is a high-level, general-purpose programming language. Its design philosophy emphasizes
code readability with the use of significant indentation. Python is dynamically typed and garbage-
collected. It supports multiple programming paradigms, including structured (particularly
procedural), object-oriented and functional programming.
Search Wikipedia: Java programming
Java is a high-level, class-based, object-oriented programming language that is designed to ha
ve as few implementation dependencies as possible. It is a general-purpose programming languag
e intended to let programmers write once, run anywhere (WORA), meaning that compiled Java code
can run on all platforms that support Java without the need to recompile. Java applications a
re typically compiled to bytecode that can run on any Java virtual machine (JVM) regardless of
the underlying computer architecture.
Search Wikipedia: C++ Programming
C (pronounced - like the letter c) is a general-purpose computer programming language. It was
created in the 1970s by Dennis Ritchie, and remains very widely used and influential. By desi
gn, C's features cleanly reflect the capabilities of the targeted CPUs.
```

Tutorial Part 2

We are going to build a Wikipedia OOP method program that we can integrate with our ongoing JARVIS program. The example run is the same. The difference is that we can copy this method into our ongoing JARVIS project and access it with Speech Recognition and use Text to Speech to have JARVIS read the Wikipedia entry.

```

1  """
2      Name: wikipedia_3_oop.py
3      Author:
4      Created:
5      Purpose: OOP method which can be integrated
6              into main JARVIS project
7  """
8
9  # pip install wikipedia
10 import wikipedia
11
12
13 class WikipediaApp:
14     def __init__(self):
15         pass
16
17     # ----- GET WIKIPEDIA -----#
18     def get_wikipedia(self):
19         """Search Wikipedia"""
20         try:
21             # Type in your search term
22             result = input("Search Wikipedia: ")
23             # Return a summary result of 3 sentences
24             self._summary = wikipedia.summary(result, sentences=3)
25
26         except:
27             # Use raise for troubleshooting exceptions
28             # raise
29             # If there is an exception, allow the user to try again
30             print("Try a different search term.")
31
32     # ----- DISPLAY WIKIPEDIA -----#
33     def display_wikipedia(self):
34         """Display Wikipedia search results"""
35         print(self._summary)
36
37
38 # Create a program object
39 wikipedia_app = WikipediaApp()
40 while True:
41     wikipedia_app.get_wikipedia()
42     wikipedia_app.display_wikipedia()

```

Example run:

```
Search Wikipedia: Python programming
Python is a high-level, general-purpose programming language. Its design philosophy emphasizes
code readability with the use of significant indentation. Python is dynamically typed and garbage-
collected. It supports multiple programming paradigms, including structured (particularly
procedural), object-oriented and functional programming.
Search Wikipedia: Java programming
Java is a high-level, class-based, object-oriented programming language that is designed to ha
ve as few implementation dependencies as possible. It is a general-purpose programming languag
e intended to let programmers write once, run anywhere (WORA), meaning that compiled Java code
can run on all platforms that support Java without the need to recompile. Java applications a
re typically compiled to bytecode that can run on any Java virtual machine (JVM) regardless of
the underlying computer architecture.
Search Wikipedia: C++ Programming
C (pronounced - like the letter c) is a general-purpose computer programming language. It was
created in the 1970s by Dennis Ritchie, and remains very widely used and influential. By desi
gn, C's features clearly reflect the capabilities of the targeted CPUs.
```

Assignment: The JARVIS Project

At this point, the JARVIS Project contains voice recognition and text to speech. The following table shows possible uses of each module. For a robust interface, you may want to print and have JARVIS speak.

Module	Purpose
Text to speech	Announce menu choices
	Prompt user for input
	Announce command results
Voice recognition	Make menu choices
	Provide input

It is now up to you. The world is under attack from creatures from another dimension, we don't know what we are dealing with. We need some help from Wikipedia.

In your JARVIS program:

1. Add **import wikipedia** to the top of the program.
2. Copy the **get_wikipedia()** method into your program. Don't copy the entire program, just the method.
3. Use the **get_command()** method to ask Wikipedia a question and display the answer. Your program output does not have to match.

Troubleshooting the Microphone

If your speech recognition gets hung on Listening . . .

Copy and paste the following program into a python file and run it. This will give you the index of the device you wish to use.

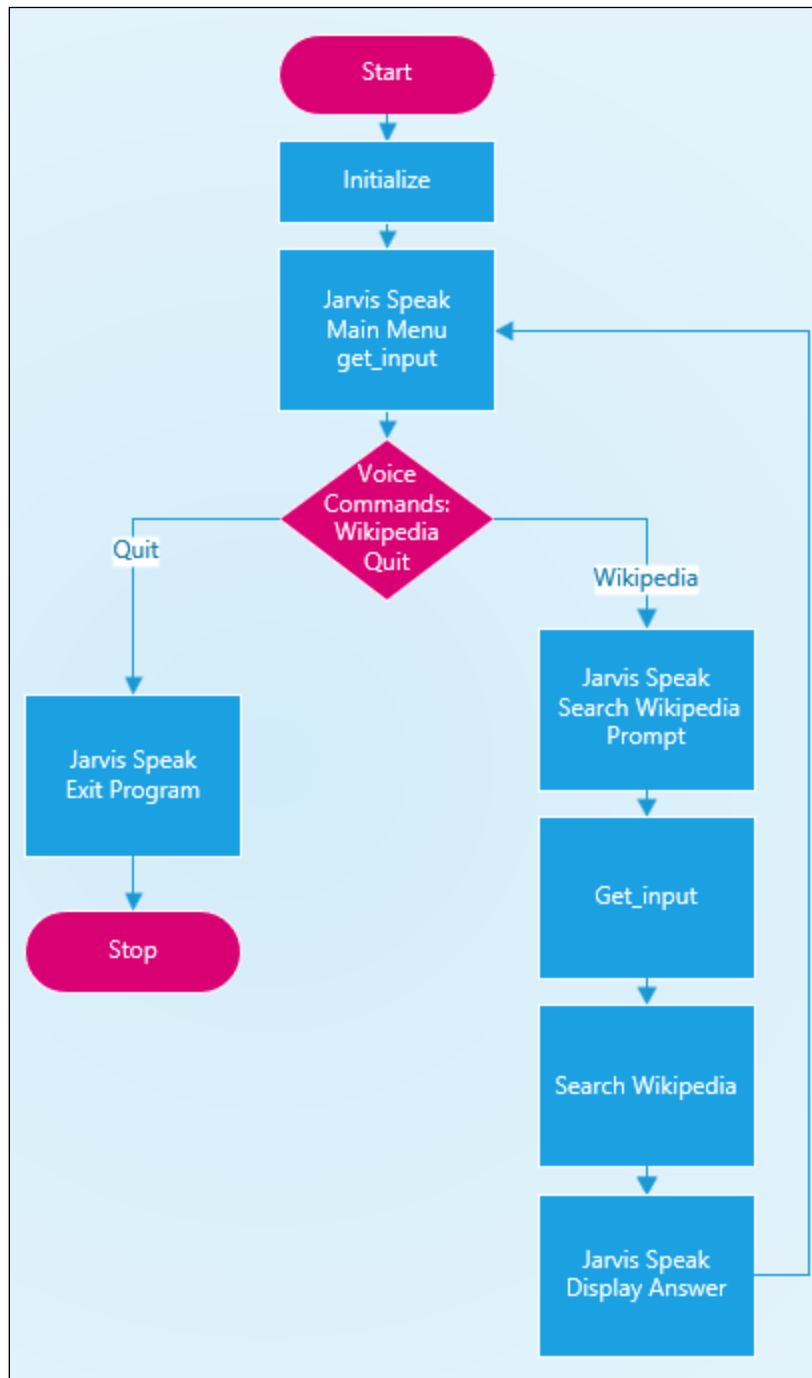
```
# The recognizer hangs on recognizer_instance.listen;
# when it's calling Microphone.MicrophoneStream.read
# Once you do this, change all instances of Microphone() to
# Microphone(device_index=MICROPHONE_INDEX),
# where MICROPHONE_INDEX is the hardware-specific index of the microphone.

# To figure out what the value of MICROPHONE_INDEX should be,
# run the following code:

import speech_recognition as sr
for index, name in enumerate(sr.Microphone.list_microphone_names()):
    print(
        f'Microphone: \"{name}\" found for
`Microphone(device_index={index})`'
    )
```

Flowchart

The following flowchart shows the basic flow of the program.



Example run:

NOTE: Jarvis seems to recognize faster if you run it from the command line, rather than from VSCode.

```
+-----+
|  JARVIS Main Menu  |
+-----+
Commands: Wikipedia, quit
Talking . . .
Listening....
Recognizing . . .
Wikipedia
+-----+
|  Search Wikipedia  |
+-----+
What would you like to search for on Wikipedia?
Listening....
Recognizing . . .
Python programming

Python is a high-level, general-purpose programming language. Its design philosophy emphasizes
code readability with the use of significant indentation. Python is dynamically typed and garbage-
collected. It supports multiple programming paradigms, including structured (particularly
procedural), object-oriented and functional programming.
+-----+
|  JARVIS Main Menu  |
+-----+
Commands: Wikipedia, quit
Listening....
Recognizing . . .
quit
Goodbye!

Have a good day!
```

Assignment Submission

This is an ongoing project you can add to outside of these assignments. We have learned how to have JARVIS recognize speech, talk to us, and run a program. The sky is the limit! This could be a good project to add to your GitHub software engineering resume.

1. Attach a screenshot of your completed GitHub repository.
2. Attach a screenshot of your working program.
3. Insert the URL of your GitHub repository.
4. Attach the pseudocode.

5. Submit in Blackboard.