NLP703: Speech Processing
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Lab 1

Python Editor

You can install the editor of your preference such as PyCharm or VSCode.

Virtual Environment (Optional)

Create Virtual Environment using Conda so you can install the required libraries.

conda create --name nlp-env

Python Speech Libraries

There are so many libraries for speech processing in Python. Let's explore speech synthesis and speech recognition today.

Speech Synthesis

https://pypi.org/project/pyttsx3/
`pyttsx3` is a text-to-speech conversion library in Python. Unlike alternative libraries, it works offline, and is compatible with both Python 2 and 3.

Installation

```
pip install pyttsx3
```

Usage:

```
import pyttsx3

engine = pyttsx3.init()

engine.say("I will speak this text")

engine.runAndWait()
```

Object Creation:

```
import pyttsx3

engine = pyttsx3.init() # object creation
```

Changing Voice Rate:

```
""" RATE"""

rate = engine.getProperty('rate')   # getting details of current speaking rate

print (rate)                        #printing current voice rate

engine.setProperty('rate', 125)     # setting up new voice rate
```

Changing Volume:

```
"""VOLUME"""

volume = engine.getProperty('volume')   #getting to know current volume level
(min=0 and max=1)

print (volume)                          #printing current volume level

engine.setProperty('volume',1.0)    # setting up volume level  between 0 and 1
```

Changing Voice:

```
"""VOICE"""

voices = engine.getProperty('voices')       #getting details of current voice

#engine.setProperty('voice', voices[0].id)  #changing index, changes voices. o
for male

engine.setProperty('voice', voices[1].id)   #changing index, changes voices. 1
for female
```

Generate Voice:

```
engine.say("Hello World!")

engine.say('My current speaking rate is ' + str(rate))

engine.runAndWait()

engine.stop()
```

Saving voice to file (mp3):

```
"""Saving Voice to a file"""

# On linux make sure that 'espeak' and 'ffmpeg' are installed

engine.save_to_file('Hello World', 'test.mp3')

engine.runAndWait()
```

Exercise

Write a python application to read conversations from text file between two persons. Change the voice for each person. Use the volume and rate to mimic intensity and the tone between two persons.

Speech Recognition

https://pypi.org/project/SpeechRecognition/

SpeechRecognition 3.8.1 Library for performing speech recognition, with support for several engines and APIs, online and offline.

After installing all requirements/prerequisites.

Quickstart: `pip install SpeechRecognition`. See the "Installing" section for more details.

To quickly try it out, run `python -m speech_recognition` after installing.

Output

```
(base) sshehata@Shadys-MacBook ~ % pip install SpeechRecognition
Collecting SpeechRecognition
  Downloading SpeechRecognition-3.8.1-py2.py3-none-any.whl (32.8 MB)
     |████████████████████████████████| 32.8 MB 60.2 MB/s
Installing collected packages: SpeechRecognition
Successfully installed SpeechRecognition-3.8.1
(base) sshehata@Shadys-MacBook ~ % python -m speech_recognition
A moment of silence, please...
Set minimum energy threshold to 82.82198935472287
Say something!
Got it! Now to recognize it...
You said hello
Say something!
Got it! Now to recognize it...
You said hi
Say something!
Got it! Now to recognize it...
You said I would like to say this is awesome
```