IBM Developer
SKILLS NETWORK

Watson Speech to Text Translator

Estimated time needed: **25** minutes

Objectives

After completing this lab you will be able to:

- Create Speech to Text Translator

Introduction

In this notebook, you will learn to convert an audio file of an English speaker to text using a Speech to Text API. Then you will translate the English version to a Spanish version using a Language Translator API. **Note:** You must obtain the API keys and enpoints to complete the lab.

Table of Contents

In [1]:

```
#you will need the following library
!pip install ibm_watson wget
```

```
Collecting ibm_watson
Requirement already satisfied: wget in /home/jupyterlab/conda/envs/pyth
on/lib/python3.6/site-packages (3.2)
Collecting websocket-client==0.48.0 (from ibm_watson)
  Using cached https://files.pythonhosted.org/packages/8a/a1/72ef9aa26c
fe1a75cee09fc1957e4723add9de098c15719416a1ee89386b/websocket_client-0.4
8.0-py2.py3-none-any.whl
Requirement already satisfied: python-dateutil>=2.5.3 in /home/jupyterl
ab/conda/envs/python/lib/python3.6/site-packages (from ibm_watson) (2.
8.1)
Requirement already satisfied: requests<3.0,>=2.0 in /home/jupyterlab/c
onda/envs/python/lib/python3.6/site-packages (from ibm_watson) (2.25.1)
Collecting ibm-cloud-sdk-core>=3.3.6 (from ibm_watson)
Requirement already satisfied: six in /home/jupyterlab/conda/envs/pytho
n/lib/python3.6/site-packages (from websocket-client==0.48.0->ibm_watso
n) (1.16.0)
Requirement already satisfied: idna<3,>=2.5 in /home/jupyterlab/conda/e
nvs/python/lib/python3.6/site-packages (from requests<3.0,>=2.0->ibm_wa
tson) (2.10)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in /home/jupyterla
b/conda/envs/python/lib/python3.6/site-packages (from requests<3.0,>=2.
0->ibm_watson) (1.26.4)
Requirement already satisfied: certifi>=2017.4.17 in /home/jupyterlab/c
onda/envs/python/lib/python3.6/site-packages (from requests<3.0,>=2.0->
ibm_watson) (2020.12.5)
Requirement already satisfied: chardet<5,>=3.0.2 in /home/jupyterlab/co
nda/envs/python/lib/python3.6/site-packages (from requests<3.0,>=2.0->i
bm_watson) (4.0.0)
Collecting PyJWT<3.0.0,>=2.0.1 (from ibm-cloud-sdk-core>=3.3.6->ibm_wat
son)
  Using cached https://files.pythonhosted.org/packages/3f/32/d5d3cab27f
ee7f6b22d7cd7507547ae45d52e26030fa77d1f83d0526c6e5/PyJWT-2.1.0-py3-none
-any.whl
Installing collected packages: websocket-client, PyJWT, ibm-cloud-sdk-c
ore, ibm-watson
Successfully installed PyJWT-2.1.0 ibm-cloud-sdk-core-3.10.0 ibm-watson
-5.1.0 websocket-client-0.48.0
```

Speech to Text

First we import `SpeechToTextV1` from `ibm_watson`.For more information on the API, please click on this link

In [1]:

```
from ibm_watson import SpeechToTextV1
import json
from ibm_cloud_sdk_core.authenticators import IAMAuthenticator
```

The service endpoint is based on the location of the service instance, we store the information in the variable URL. To find out which URL to use, view the service credentials and paste the url here.

In [1]:

```
url_s2t = {'https://api.eu-gb.speech-to-text.watson.cloud.ibm.com/insta
nces/8b43224a-2815-409b-b413-3813635b1eb3'}
```

You require an API key, and you can obtain the key on the Dashboard .

```
In [11]: iam_apikey_s2t = "CX9956tSOA4RaOdjfszpL78e_eej8sOybd1OI0r9_0jg"
```

You create a Speech To Text Adapter object the parameters are the endpoint and API key.

```
In [2]: authenticator = IAMAuthenticator(iam_apikey_s2t)
        s2t = SpeechToTextV1(authenticator=authenticator)
        s2t.set_service_url(url_s2t)
        s2t
```

```
---------------------------------------------------------------------------
----
NameError                                 Traceback (most recent call l
ast)
<ipython-input-2-dce91b3a7b42> in <module>
----> 1 authenticator = IAMAuthenticator(iam_apikey_s2t)
      2 s2t = SpeechToTextV1(authenticator=authenticator)
      3 s2t.set_service_url(url_s2t)
      4 s2t

NameError: name 'IAMAuthenticator' is not defined
```

Lets download the audio file that we will use to convert into text.

```
In [ ]: !wget -O PolynomialRegressionandPipelines.mp3  https://cf-courses-data.
        s3.us.cloud-object-storage.appdomain.cloud/IBMDeveloperSkillsNetwork-PY
        0101EN-SkillsNetwork/labs/Module%205/data/PolynomialRegressionandPipeli
        nes.mp3
```

We have the path of the wav file we would like to convert to text

```
In [ ]: filename='PolynomialRegressionandPipelines.mp3'
```

We create the file object `wav` with the wav file using `open` ; we set the `mode` to "rb" , this is similar to read mode, but it ensures the file is in binary mode.We use the method `recognize` to return the recognized text. The parameter audio is the file object `wav` , the parameter `content_type` is the format of the audio file.

```
In [ ]: with open(filename, mode="rb")  as wav:
            response = s2t.recognize(audio=wav, content_type='audio/mp3')
```

The attribute result contains a dictionary that includes the translation:

```
In [13]: response.result
```

```
---------------------------------------------------------------------------
----
NameError                                 Traceback (most recent call l
ast)
<ipython-input-13-8e95a0f1890d> in <module>
----> 1 response.result

NameError: name 'response' is not defined
```

```
In [14]: from pandas import json_normalize

         json_normalize(response.result['results'],"alternatives")
```

```
---------------------------------------------------------------------------
----
NameError                                 Traceback (most recent call l
ast)
<ipython-input-14-f110300ac1dd> in <module>
      1 from pandas import json_normalize
      2 
----> 3 json_normalize(response.result['results'],"alternatives")

NameError: name 'response' is not defined
```

```
In [ ]: response
```

We can obtain the recognized text and assign it to the variable `recognized_text`:

In [ ]:

```
recognized_text=response.result['results'][0]["alternatives"][0]["transcript"]
type(recognized_text)
```

Language Translator

First we import `LanguageTranslatorV3` from ibm_watson. For more information on the API click here

In [6]:

```
from ibm_watson import LanguageTranslatorV3
```

The service endpoint is based on the location of the service instance, we store the information in the variable URL. To find out which URL to use, view the service credentials.

In [7]:

```
url_lt='https://api.eu-gb.speech-to-text.watson.cloud.ibm.com/instances/8b43224a-2815-409b-b413-3813635b1eb3'
```

You require an API key, and you can obtain the key on the Dashboard.

In [8]:

```
apikey_lt='CX9956tSOA4RaOdjfszpL78e_eej8sOybd1OI0r9_0jg'
```

API requests require a version parameter that takes a date in the format version=YYYY-MM-DD. This lab describes the current version of Language Translator, 2018-05-01

In [9]:

```
version_lt='2018-05-01'
```

we create a Language Translator object `language_translator`:

In [10]:

```
authenticator = IAMAuthenticator(apikey_lt)
```

```
language_translator = LanguageTranslatorV3(version=version_lt,authentic
ator=authenticator)
language_translator.set_service_url(url_lt)
language_translator
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-10-6dad65c727a6> in <module>
----> 1 authenticator = IAMAuthenticator(apikey_lt)
      2 language_translator = LanguageTranslatorV3(version=version_lt,a
uthenticator=authenticator)
      3 language_translator.set_service_url(url_lt)
      4 language_translator
      5 

NameError: name 'IAMAuthenticator' is not defined
```

We can get a Lists the languages that the service can identify. The method Returns the language code. For example English (en) to Spanis (es) and name of each language.

In [4]:

```
from pandas import json_normalize

json_normalize(language_translator.list_identifiable_languages().get_re
sult(), "languages")
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
<ipython-input-4-d4a77f161cf5> in <module>
      1 from pandas import json_normalize
      2 
----> 3 json_normalize(language_translator.list_identifiable_languages(
).get_result(), "languages")

NameError: name 'language_translator' is not defined
```

We can use the method `translate` this will translate the text. The parameter text is the text. Model_id is the type of model we would like to use use we use list the language . In this case, we set it to 'en-es' or English to Spanish. We get a Detailed Response object translation_response

```
In [14]: translation_response = language_translator.translate(\
             text=recognized_text, model_id='en-es')
         translation_response
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call l
ast)
<ipython-input-14-a75496d94732> in <module>
----> 1 translation_response = language_translator.translate(\
      2     text=recognized_text, model_id='en-es')
      3 translation_response

NameError: name 'language_translator' is not defined
```

The result is a dictionary.

```
In [ ]: translation=translation_response.get_result()
        translation
```

We can obtain the actual translation as a string as follows:

```
In [ ]: spanish_translation =translation['translations'][0]['translation']
        spanish_translation
```

We can translate back to English

```
In [ ]: translation_new = language_translator.translate(text=spanish_translatio
        n ,model_id='es-en').get_result()
```

We can obtain the actual translation as a string as follows:

In [ ]:

```
translation_eng=translation_new['translations'][0]['translation']
translation_eng
```

Quiz

Translate to French.

In [3]:

```
# Write your code below and press Shift+Enter to execute
French_translation=language_translator.translate(
    text=translation_eng , model_id='en-fr').get_result()

French_translation['translations'][0]['translation']
```

```
-----------------------------------------------------------------------
----
NameError                                 Traceback (most recent call l
ast)
<ipython-input-3-ab0457a9bf2a> in <module>
      1 # Write your code below and press Shift+Enter to execute
----> 2 French_translation=language_translator.translate(
      3     text=translation_eng , model_id='en-fr').get_result()
      4 
      5 French_translation['translations'][0]['translation']

NameError: name 'language_translator' is not defined
```

▶ Click here for the solution

Language Translator

References

https://cloud.ibm.com/apidocs/speech-to-text?code=python

https://cloud.ibm.com/apidocs/language-translator?code=python

Authors:

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Joseph Santarcangelo has a PhD in Electrical Engineering, his research focused on using machine learning, signal processing, and computer vision to determine how videos impact human cognition. Joseph has been working for IBM since he completed his PhD.

Other Contributor(s)

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Change Log

Date (YYYY-MM-DD)	Version	Changed By	Change Description
2021-04-07	2.2	Malika	Updated the libraries
2021-01-05	2.1	Malika	Added a library
2020-08-26	2.0	Lavanya	Moved lab to course repo in GitLab