

Lab Assignment 4: Using APIs in Python - Rachel Holman

DS 6001: Practice and Application of Data Science

Instructions

Please answer the following questions as completely as possible using text, code, and the results of code as needed. Format your answers in a Jupyter notebook. To receive full credit, make sure you address every part of the problem, and make sure your document is formatted in a clean and professional way.

In this lab, you will work with the public API provided by genius.com, a website that calls itself "the world's biggest collection of song lyrics and musical knowledge." You will need to read the API documentation carefully, acquire an access key, and use it without sharing it to pull data from this API into Python. You will also practice using a library made specifically to wrap around `requests` to make calling from the Genius API easier.

Problem 0

Import the following libraries:

```
In [1]: import numpy as np
import pandas as pd
import requests
import json
import os
import dotenv
import sys
sys.tracebacklimit = 0 # turn off the error tracebacks
```

Problem 1

The Genius API documentation is here: <https://docs.genius.com/#/getting-started-h1>. Read through the documentation carefully. Although the Genius API is free and public, it still requires users an access key to use the API. In this case, Genius provides users with three codes: a client ID, a client ID secret, and a client access token. Use the documentation to find a way to obtain these codes for yourself. Write a paragraph that describes all of the steps you needed to take (but DO NOT list your access codes in this paragraph).

Some hints and cautions:

1. Before you can use the API, you will need a regular, free user account with Genius. Sign-up here: https://genius.com/signup_or_login
2. Genius's API is built to support third-party app development, not data scientists. The language is entirely geared toward app development. Under "Authentication" there are instructions to third-party developers for guiding their own users in getting access keys. That's not relevant to getting access for yourself. It's not hard to get an access key, but the guidance here is not very clear. Be patient and read everything in the Authentication section carefully.
3. When you arrive at the page that allows you to register for API access keys, the language is still geared toward app development. You will be prompted to name your app and provide the URLs associated with the app. It doesn't much matter what you name your app, and I just used the Collab main page (<https://collab.its.virginia.edu/portal?containerLogin=true>) for the URLs.
4. When you get your codes, copy them in a text file. In problem 2 you will copy these codes over again to a `.env` file. [4 points]

In order to obtain these access codes, I first clicked on the "signup or login" link provided and created an account with Genius. Then, I went to the API documentation website for Genius and clicked the button to "Authorize with Genius". It then brought me to an API Client webpage where I entered my name and gave the app name "UVA". For website, I entered the link to the [UVA homepage](#). After submitting, I was provided with my Client ID, Client Secret, and Client Access Token keys. I copy and pasted all of these into a new text file and saved this to my computer.

Problem 2

Create a `.env` file for this project. Open it, copy your access codes into it, and save it. Then use Python code to load the environmental variables contained in the `.env` file, and create variables that contain each of the three codes. (You can print these variables to make sure it worked, but do not allow your access keys to display in your notebook). [4 points]

```
In [2]: dotenv.load_dotenv()
clientid= os.getenv('clientid')
clientsecret= os.getenv('clientsecret')
clientaccesstoken= os.getenv('clientaccesstoken')
```

Problem 3

The root for all Genius APIs is <https://api.genius.com>. Find the endpoint for the Search API. (You will have to click the "Authorize with Genius" button in the upper-right corner if you haven't already done so). Use the `requests` library to issue a search for Bob Dylan. Genius's API is organized in a way that every individual artist has his or her own API

endpoint. Display a portion of the JSON output that displays the API endpoint path for the data on Bob Dylan.

Hint: to authenticate, specify your access token (not your client ID or client secret) as the `access_token` parameter. You will have to dig around the JSON output to find the artist ID, but it is listed under `primary_artist` several branches down the JSON tree. [4 points]

```
In [3]: root= 'https://api.genius.com'
        endpoint = '/search'
        parameters = {'q': 'Bob Dylan',
                      'access_token': clientaccesstoken}
        r = requests.get(root + endpoint, params= parameters)
        r
```

Out[3]: <Response [200]>

```
In [4]: bobbydylanid = json.loads(r.text)['response']['hits'][0]['result']['primary_artist']
        bobbydylanid
```

Out[4]: 181

Problem 4

Add `/songs` to the end of the the endpoint path you found in problem 3 and use this path to request the 20 most popular Bob Dylan songs. Organize these data in a `pandas` data frame. [4 points]

```
In [5]: endpoint = f'/artists/{bobbydylanid}/songs'
        parameters = {'per_page': 20,
                      'page': 1,
                      'sort': 'popularity',
                      'access_token': clientaccesstoken}
        r = requests.get(root + endpoint, params= parameters)
```

```
In [6]: myjson = json.loads(r.text)
        #[x['title'] for x in myjson['response']['songs']]
        popularbob = pd.json_normalize(myjson, record_path=['response', 'songs'])
        popularbob
```

Out [6]:

	annotation_count	api_path	artist_names	full_title	head
0	18	/songs/96286	USA For Africa	We Are the World by USA For Africa	https://images.genius.com/9
1	12	/songs/79424	Bob Dylan	Blowin' in the Wind by Bob Dylan	https://images.genius.com/a
2	1	/songs/68146	Adele	Make You Feel My Love by Adele	https://images.genius.com/e
3	125	/songs/5393247	Bob Dylan	Murder Most Foul by Bob Dylan	https://images.genius.com
4	17	/songs/62605	Bob Dylan	The Times They Are A-Changin' by Bob Dylan	https://images.genius.com/e
5	15	/songs/98664	Bob Dylan	All Along the Watchtower by Bob Dylan	https://images.genius.com/f
6	7	/songs/103982	Guns N' Roses (Ft. The Waters)	Knockin' on Heaven's Door by Guns N' Roses (Ft...	https://images.genius.com/c
7	24	/songs/54784	Bob Dylan	Like a Rolling Stone by Bob Dylan	https://images.genius.com/5c
8	10	/songs/84846	Bob Dylan	Don't Think Twice, It's All Right by Bob Dylan	https://images.genius.com/a
9	10	/songs/63341	The Jimi Hendrix Experience	All Along the Watchtower by The Jimi Hendrix E...	https://images.genius.com/8
10	10	/songs/79749	Bob Dylan	Make You Feel My Love by Bob Dylan	https://images.genius.com/c
11	27	/songs/87402	Bob Dylan	Hurricane by Bob Dylan	https://images.genius.com/2
12	20	/songs/224	Bob Dylan	Subterranean Homesick Blues by Bob Dylan	https://images.genius.com/2
13	21	/songs/75446	Bob Dylan	Mr. Tambourine Man	https://images.genius.com/2

	annotation_count	api_path	artist_names	full_title	head
				by Bob Dylan	
14	36	/songs/105186	Bob Dylan	A Hard Rain's A-Gonna Fall by Bob Dylan	https://images.genius.com/a
15	14	/songs/154239	Darius Rucker	Wagon Wheel by Darius Rucker	https://images.genius.com/7
16	72	/songs/92350	Bob Dylan	Desolation Row by Bob Dylan	https://images.genius.com/5c
17	28	/songs/118799	Bob Dylan	Tangled Up in Blue by Bob Dylan	https://images.genius.com/9
18	50	/songs/75463	Bob Dylan	It's Alright, Ma (I'm Only Bleeding) by Bob Dylan	https://images.genius.com/2
19	6	/songs/199531	Bob Dylan	Knockin' on Heaven's Door by Bob Dylan	https://images.rapgenius.co

20 rows × 35 columns

Problem 5

Install and import the `lyricsgenius` library in Python, which is a wrapper around `requests` that works specifically with the Genius API. . Follow the guide on the GitHub repository for this library (<https://github.com/johnwmillr/LyricsGenius>) for instructions on using the library. Use the `lyricsgenius` library to download and display the lyrics to "Tangled Up in Blue" by Bob Dylan. [4 points]

```
In [7]: #!pip install lyricsgenius
import lyricsgenius
genius = lyricsgenius.Genius(clientaccesstoken)
```

```
In [8]: artist = genius.search_artist("Bob Dylan", max_songs=3, sort="title")
print(artist.songs)
```

Searching for songs by Bob Dyan...

Changing artist name to 'Bob Dylan'

Song 1: "10,000 Men"

Song 2: "2 X 2"

Song 3: "32-20 Blues"

Reached user-specified song limit (3).

Done. Found 3 songs.

[Song(id, artist, ...), Song(id, artist, ...), Song(id, artist, ...)]

```
In [9]: song = artist.song("Tangled Up in Blue")
# or:
# song = genius.search_song("To You", artist.name)
print(song.lyrics)
```

Searching for "Tangled Up in Blue" by Bob Dylan...
Done.

91 ContributorsTangled Up in Blue Lyrics[Verse 1]

Early one morning the sun was shining
I was laying in bed
Wondering if she'd changed at all
If her hair was still red
Her folks they said our lives together
Sure was going to be rough
They never did like Mama's homemade dress
Papa's bankbook wasn't big enough
And I was standing on the side of the road
Rain falling on my shoes
Heading out for the East Coast
Lord knows I've paid some dues
Getting through
Tangled up in blue

[Verse 2]

She was married when we first met
Soon to be divorced
I helped her out of a jam, I guess
But I used a little too much force
We drove that car as far as we could
Abandoned it out west
Split up on a dark sad night
Both agreeing it was best
She turned around to look at me
As I was walking away
I heard her say over my shoulder
"We'll meet again someday
On the avenue"

Tangled up in blue

See Bob Dylan LiveGet tickets as low as \$105You might also like[Verse 3]

I had a job in the great north woods
Working as a cook for a spell
But I never did like it all that much
And one day the ax just fell
So I drifted down to New Orleans
Where I lucky was to be employed
Working for a while on a fishing boat
Right outside of Delacroix
But all the while I was alone
The past was close behind
I seen a lot of women
But she never escaped my mind
And I just grew
Tangled up in blue

[Verse 4]

She was working in a topless place
And I stopped in for a beer
I just kept looking at the side of her face
In the spotlight, so clear
And later on, when the crowd thinned out
I was just about to do the same
She was standing there, in back of my chair
Said, "Tell me, don't I know your name?"
I muttered something underneath my breath
She studied the lines on my face

I must admit, I felt a little uneasy
When she bent down to tie the laces
Of my shoe
Tangled up in blue
[Verse 5]
She lit a burner on the stove
And offered me a pipe
"I thought you'd never say hello," she said
"You look like the silent type"
Then she opened up a book of poems
And handed it to me
Written by an Italian poet
From the thirteenth century
And every one of them words rang true
And glowed like burning coal
Pouring off of every page
Like it was written in my soul
From me to you
Tangled up in blue

[Verse 6]
I lived with them on Montague Street
In a basement down the stairs
There was music in the cafes at night
And revolution in the air
Then he started into dealing with slaves
And something inside of him died
She had to sell everything she owned
And froze up inside
And when it finally, the bottom fell out
I became withdrawn
The only thing I knew how to do
Was to keep on keeping on
Like a bird that flew
Tangled up in blue

[Verse 7]
So now I'm going back again
I got to get to her somehow
All the people we used to know
They're an illusion to me now
Some are mathematicians
Some are carpenter's wives
Don't know how it all got started
I don't know what they're doing with their lives
But me, I'm still on the road
A-heading for another joint
We always did feel the same
We just saw it from a different point
Of view
Tangled up in blue