

Lab Assignment 4: Using APIs in Python

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 (<https://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]: #!pip install python-dotenv
```

```
In [2]: 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> (<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 (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> (<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]

Answer 1:

- First, I have created a regular user by providing a Nickname, valid email address and a password.
- Second, I have looked through multiple pages of documentation but it was not clear at all how to obtain the tokens.
- Finally, I have realized that I actually need to create an API client directly on their website using <https://genius.com/api-clients>. From there I was able to obtain 3 keys, as expected, which I have stored in a local text file (next Problem).

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 [3]: os.getcwd()
```

```
Out[3]: '/Users/dmitrymikhaylov/Documents/learn/uva/spring2022/DS6001/surfing_data_pipeline/M4 - apis'
```

```
In [4]: #!/touch .env
```

```
In [5]: # Check if .env was created in the same directory  
!ls -a
```

```
.                .env                labassignment4.ipynb  
..               .ipynb_checkpoints  
.DS_Store        M4_codealong.ipynb
```

```
In [6]: # Load secrets  
dotenv.load_dotenv()  
CLientID = os.getenv('CLientID')  
ClientSecret = os.getenv('ClientSecret')  
ClientAccess = os.getenv('ClientAccess')
```

Problem 3

The root for all Genius APIs is <https://api.genius.com> (<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 [43]: root = 'https://api.genius.com'  
search = 'search?q=Bob%20Dylan'  
query='/Bob-dylan'  
genius_search_url = f"http://api.genius.com/search?q={query}&access_token={ClientAccess}"  
r = requests.get(genius_search_url)  
r
```

```
ERROR! Session/line number was not unique in database. History logging  
moved to new session 1284
```

```
Out[43]: <Response [200]>
```

```
In [47]: # Songs are under response/hits, below is the first song by Bob Dylan:
json_data = json.loads(r.text)
json_data['response'][0]['hits'][0]
```

```
Out[47]: [{'highlights': [],
  'index': 'song',
  'type': 'song',
  'result': {'annotation_count': 125,
    'api_path': '/songs/5393247',
    'artist_names': 'Bob Dylan',
    'full_title': 'Murder Most Foul by Bob Dylan',
    'header_image_thumbnail_url': 'https://images.genius.com/7fbaf838ffdf99315408faa29cb566ac.300x300x1.jpg',
    'header_image_url': 'https://images.genius.com/7fbaf838ffdf99315408faa29cb566ac.1000x1000x1.jpg',
    'id': 5393247,
    'lyrics_owner_id': 3360167,
    'lyrics_state': 'complete',
    'path': '/Bob-dylan-murder-most-foul-lyrics',
    'pyongs_count': 36,
    'song_art_image_thumbnail_url': 'https://images.genius.com/7fbaf838ffdf99315408faa29cb566ac.300x300x1.jpg',
    'song_art_image_url': 'https://images.genius.com/7fbaf838ffdf99315408faa29cb566ac.1000x1000x1.jpg',
    'stats': {'unreviewed_annotations': 38, 'hot': False, 'pageviews': 477823},
    'title': 'Murder Most Foul',
    'title_with_featured': 'Murder Most Foul',
    'url': 'https://genius.com/Bob-dylan-murder-most-foul-lyrics',
    'primary_artist': {'api_path': '/artists/181',
      'header_image_url': 'https://images.genius.com/facc753d420efc53bbe1e0b63a72d70b.960x719x1.jpg',
      'id': 181,
      'image_url': 'https://images.genius.com/22306423b6ad8777d1ed5b33ad8b0d0b.1000x1000x1.jpg',
      'is_meme_verified': False,
      'is_verified': False,
      'name': 'Bob Dylan',
      'url': 'https://genius.com/artists/Bob-dylan'}}}]
```

```
In [48]: # In a for loop, print title of the song and id of the artists
for song in json_data['response'][0]['hits']:
    print(song['result']['full_title'], '-- id', song['result']['primary_artist']['id'])
```

```
Murder Most Foul by Bob Dylan -- id 181
Blowin' in the Wind by Bob Dylan -- id 181
The Times They Are A-Changin' by Bob Dylan -- id 181
All Along the Watchtower by Bob Dylan -- id 181
Like a Rolling Stone by Bob Dylan -- id 181
Make You Feel My Love by Bob Dylan -- id 181
Hurricane by Bob Dylan -- id 181
Don't Think Twice, It's All Right by Bob Dylan -- id 181
Mr. Tambourine Man by Bob Dylan -- id 181
A Hard Rain's A-Gonna Fall by Bob Dylan -- id 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 [49]: endpoint='/artists/181/songs'
r = requests.get(root+endpoint, params={'sort':'popularity', 'access_token':ClientAccess})
r
```

```
ERROR! Session/line number was not unique in database. History logging
moved to new session 1287
```

```
Out[49]: <Response [200]>
```

```
In [54]: # Checking the response  
json_data = json.loads(r.text)  
json_data['response']
```

```
Out[54]: {'songs': [{'annotation_count': 16,
  'api_path': '/songs/96286',
  'artist_names': 'USA For Africa',
  'full_title': 'We Are the World by\x00USA\x00For Africa',
  'header_image_thumbnail_url': 'https://images.genius.com/9b0683e7bbd3567ac6f9c72b81a55a0a.300x169x1.jpg',
  'header_image_url': 'https://images.genius.com/9b0683e7bbd3567ac6f9c72b81a55a0a.640x360x1.jpg',
  'id': 96286,
  'lyrics_owner_id': 4733728,
  'lyrics_state': 'complete',
  'path': '/Usa-for-africa-we-are-the-world-lyrics',
  'pyongs_count': 34,
  'song_art_image_thumbnail_url': 'https://images.genius.com/51f9de13b1cb0010adb6b5c1d70a5bc1.300x300x1.jpg',
  'song_art_image_url': 'https://images.genius.com/51f9de13b1cb0010adb6b5c1d70a5bc1.1000x1000x1.jpg',
  'stats': {'unreviewed_annotations': 1, 'hot': False, 'pageviews': 482894},
  'title': 'We Are the World',
  'title_with_featured': 'We Are the World',
  'url': 'https://genius.com/Usa-for-africa-we-are-the-world-lyrics',
  'primary_artist': {'api_path': '/artists/370890',
    'header_image_url': 'https://images.genius.com/3fb2d9f68c911b5473399b97ef9427e6.768x768x1.jpg',
    'id': 370890,
    'image_url': 'https://images.genius.com/3fb2d9f68c911b5473399b97ef9427e6.768x768x1.jpg',
    'is_meme_verified': False,
    'is_verified': False,
    'name': 'USA For Africa',
    'url': 'https://genius.com/artists/Usa-for-africa'}},
  {'annotation_count': 125,
  'api_path': '/songs/5393247',
  'artist_names': 'Bob Dylan',
  'full_title': 'Murder Most Foul by\x00Bob\x00Dylan',
  'header_image_thumbnail_url': 'https://images.genius.com/7fbaf838ffd99315408faa29cb566ac.300x300x1.jpg',
  'header_image_url': 'https://images.genius.com/7fbaf838ffd99315408faa29cb566ac.1000x1000x1.jpg',
  'id': 5393247,
  'lyrics_owner_id': 3360167,
  'lyrics_state': 'complete',
  'path': '/Bob-dylan-murder-most-foul-lyrics',
  'pyongs_count': 36,
  'song_art_image_thumbnail_url': 'https://images.genius.com/7fbaf838ffd99315408faa29cb566ac.300x300x1.jpg',
  'song_art_image_url': 'https://images.genius.com/7fbaf838ffd99315408faa29cb566ac.1000x1000x1.jpg',
  'stats': {'unreviewed_annotations': 38, 'hot': False, 'pageviews': 477823},
  'title': 'Murder Most Foul',
  'title_with_featured': 'Murder Most Foul',
  'url': 'https://genius.com/Bob-dylan-murder-most-foul-lyrics',
  'primary_artist': {'api_path': '/artists/181',
    'header_image_url': 'https://images.genius.com/facc753d420efc53bbe1e0b63a72d70b.960x719x1.jpg',
```

```

      'id': 181,
      'image_url': 'https://images.genius.com/22306423b6ad8777d1ed5b33ad8
b0d0b.1000x1000x1.jpg',
      'is_meme_verified': False,
      'is_verified': False,
      'name': 'Bob Dylan',
      'url': 'https://genius.com/artists/Bob-dylan'}}},
    {'annotation_count': 12,
     'api_path': '/songs/79424',
     'artist_names': 'Bob Dylan',
     'full_title': "Blowin' in the Wind by\xa0Bob\xa0Dylan",
     'header_image_thumbnail_url': 'https://images.genius.com/afd28edb1b2
d6d5d556a7b01b108c716.300x300x1.jpg',
     'header_image_url': 'https://images.genius.com/afd28edb1b2d6d5d556a7
b01b108c716.500x500x1.jpg',
     'id': 79424,
     'lyrics_owner_id': 73267,
     'lyrics_state': 'complete',
     'path': '/Bob-dylan-blowin-in-the-wind-lyrics',
     'pyongs_count': 44,
     'song_art_image_thumbnail_url': 'https://images.genius.com/afd28edb1
b2d6d5d556a7b01b108c716.300x300x1.jpg',
     'song_art_image_url': 'https://images.genius.com/afd28edb1b2d6d5d556
a7b01b108c716.500x500x1.jpg',
     'stats': {'unreviewed_annotations': 0, 'hot': False, 'pageviews': 47
5475},
     'title': 'Blowin' in the Wind',
     'title_with_featured': "Blowin' in the Wind",
     'url': 'https://genius.com/Bob-dylan-blowin-in-the-wind-lyrics',
     'primary_artist': {'api_path': '/artists/181',
                        'header_image_url': 'https://images.genius.com/facc753d420efc53bbe1
e0b63a72d70b.960x719x1.jpg',
                        'id': 181,
                        'image_url': 'https://images.genius.com/22306423b6ad8777d1ed5b33ad8
b0d0b.1000x1000x1.jpg',
                        'is_meme_verified': False,
                        'is_verified': False,
                        'name': 'Bob Dylan',
                        'url': 'https://genius.com/artists/Bob-dylan'}}},
    {'annotation_count': 1,
     'api_path': '/songs/68146',
     'artist_names': 'Adele',
     'full_title': 'Make You Feel My Love by\xa0Adele',
     'header_image_thumbnail_url': 'https://images.genius.com/e23228f25b7
6446cf8delc5fe624f262.300x300x1.jpg',
     'header_image_url': 'https://images.genius.com/e23228f25b76446cf8del
c5fe624f262.1000x1000x1.jpg',
     'id': 68146,
     'lyrics_owner_id': 82481,
     'lyrics_state': 'complete',
     'path': '/Adele-make-you-feel-my-love-lyrics',
     'pyongs_count': 49,
     'song_art_image_thumbnail_url': 'https://images.genius.com/0fffd840e4
21a774fc56445c4c31151b6.300x300x1.jpg',
     'song_art_image_url': 'https://images.genius.com/0fffd840e421a774fc56
445c4c31151b6.1000x1000x1.jpg',
     'stats': {'unreviewed_annotations': 0, 'hot': False, 'pageviews': 42

```



```

8505},
  'title': 'Make You Feel My Love',
  'title_with_featured': 'Make You Feel My Love',
  'url': 'https://genius.com/Adele-make-you-feel-my-love-lyrics',
  'primary_artist': {'api_path': '/artists/2300',
    'header_image_url': 'https://images.genius.com/9afdcdb0546e87a62efc35d9456ec12a1.1000x525x1.jpg',
    'id': 2300,
    'image_url': 'https://images.genius.com/4c3ac1f1d845d251671a892309b5f9b5.1000x1000x1.jpg',
    'is_meme_verified': False,
    'is_verified': False,
    'name': 'Adele',
    'url': 'https://genius.com/artists/Adele'}},
  {'annotation_count': 18,
    'api_path': '/songs/62605',
    'artist_names': 'Bob Dylan',
    'full_title': 'The Times They Are A-Changin' by\x0Bob\x0Dylan',
    'header_image_thumbnail_url': 'https://images.genius.com/e00b4dcec135cb5ab3eed4fb516102ac.300x300x1.jpg',
    'header_image_url': 'https://images.genius.com/e00b4dcec135cb5ab3eed4fb516102ac.1000x1000x1.jpg',
    'id': 62605,
    'lyrics_owner_id': 49202,
    'lyrics_state': 'complete',
    'path': '/Bob-dylan-the-times-they-are-a-changin-lyrics',
    'pyongs_count': 38,
    'song_art_image_thumbnail_url': 'https://images.genius.com/3f8af2a0b75202890de67fbfe572fe94.300x300x1.jpg',
    'song_art_image_url': 'https://images.genius.com/3f8af2a0b75202890de67fbfe572fe94.571x571x1.jpg',
    'stats': {'unreviewed_annotations': 3, 'hot': False, 'pageviews': 420665},
    'title': 'The Times They Are A-Changin'',
    'title_with_featured': 'The Times They Are A-Changin'',
    'url': 'https://genius.com/Bob-dylan-the-times-they-are-a-changin-lyrics',
    'primary_artist': {'api_path': '/artists/181',
      'header_image_url': 'https://images.genius.com/facc753d420efc53bbe1e0b63a72d70b.960x719x1.jpg',
      'id': 181,
      'image_url': 'https://images.genius.com/22306423b6ad8777d1ed5b33ad8b0d0b.1000x1000x1.jpg',
      'is_meme_verified': False,
      'is_verified': False,
      'name': 'Bob Dylan',
      'url': 'https://genius.com/artists/Bob-dylan'}},
    {'annotation_count': 15,
      'api_path': '/songs/98664',
      'artist_names': 'Bob Dylan',
      'full_title': 'All Along the Watchtower by\x0Bob\x0Dylan',
      'header_image_thumbnail_url': 'https://images.genius.com/f727dfc7b28942c59cd6695d9a2dcf2c.300x300x1.jpg',
      'header_image_url': 'https://images.genius.com/f727dfc7b28942c59cd6695d9a2dcf2c.1000x1000x1.jpg',
      'id': 98664,
      'lyrics_owner_id': 779,

```

```
'lyrics_state': 'complete',
'path': '/Bob-dylan-all-along-the-watchtower-lyrics',
'pyongs_count': 42,
'song_art_image_thumbnail_url': 'https://images.genius.com/40169c4a8
6e479f32e7a44e3ae4d85d4.300x300x1.jpg',
'song_art_image_url': 'https://images.genius.com/40169c4a86e479f32e7
a44e3ae4d85d4.320x320x1.jpg',
'stats': {'unreviewed_annotations': 0, 'hot': False, 'pageviews': 38
8318},
'title': 'All Along the Watchtower',
'title_with_featured': 'All Along the Watchtower',
'url': 'https://genius.com/Bob-dylan-all-along-the-watchtower-lyric
s',
'primary_artist': {'api_path': '/artists/181',
'header_image_url': 'https://images.genius.com/facc753d420efc53bbe1
e0b63a72d70b.960x719x1.jpg',
'id': 181,
'image_url': 'https://images.genius.com/22306423b6ad8777d1ed5b33ad8
b0d0b.1000x1000x1.jpg',
'is_meme_verified': False,
'is_verified': False,
'name': 'Bob Dylan',
'url': 'https://genius.com/artists/Bob-dylan'}}},
{'annotation_count': 24,
'api_path': '/songs/54784',
'artist_names': 'Bob Dylan',
'full_title': 'Like a Rolling Stone by\xa0Bob\xa0Dylan',
'header_image_thumbnail_url': 'https://images.genius.com/5de9704b9bd
8773ddbcblde962f62386.300x300x1.jpg',
'header_image_url': 'https://images.genius.com/5de9704b9bd8773ddbcbl
de962f62386.1000x1000x1.jpg',
'id': 54784,
'lyrics_owner_id': 7,
'lyrics_state': 'complete',
'path': '/Bob-dylan-like-a-rolling-stone-lyrics',
'pyongs_count': 63,
'song_art_image_thumbnail_url': 'https://images.rapgenius.com/ea5vrn
a5a2wk2egyrrolaf40c.300x299x1.jpg',
'song_art_image_url': 'https://images.rapgenius.com/ea5vrna5a2wk2egy
rrolaf40c.320x319x1.jpg',
'stats': {'unreviewed_annotations': 8, 'hot': False, 'pageviews': 36
1334},
'title': 'Like a Rolling Stone',
'title_with_featured': 'Like a Rolling Stone',
'url': 'https://genius.com/Bob-dylan-like-a-rolling-stone-lyrics',
'primary_artist': {'api_path': '/artists/181',
'header_image_url': 'https://images.genius.com/facc753d420efc53bbe1
e0b63a72d70b.960x719x1.jpg',
'id': 181,
'image_url': 'https://images.genius.com/22306423b6ad8777d1ed5b33ad8
b0d0b.1000x1000x1.jpg',
'is_meme_verified': False,
'is_verified': False,
'name': 'Bob Dylan',
'url': 'https://genius.com/artists/Bob-dylan'}}},
{'annotation_count': 7,
'api_path': '/songs/103982',
```

```

    'artist_names': "Guns N' Roses (Ft. \u200bThe Waters)",
    'full_title': "Knockin' on Heaven's Door by\xa0Guns\xa0N' Roses (F
t.\xa0\u200bThe\xa0Waters)",
    'header_image_thumbnail_url': 'https://images.genius.com/cb261455009
8bf753ab31clf4a758686.300x300x1.jpg',
    'header_image_url': 'https://images.genius.com/cb2614550098bf753ab31
clf4a758686.770x770x1.jpg',
    'id': 103982,
    'lyrics_owner_id': 168784,
    'lyrics_state': 'complete',
    'path': '/Guns-n-roses-knockin-on-heavens-door-lyrics',
    'pyongs_count': 31,
    'song_art_image_thumbnail_url': 'https://images.genius.com/cb2614550
098bf753ab31clf4a758686.300x300x1.jpg',
    'song_art_image_url': 'https://images.genius.com/cb2614550098bf753ab
31clf4a758686.770x770x1.jpg',
    'stats': {'unreviewed_annotations': 1,
    'concurrents': 2,
    'hot': False,
    'pageviews': 360870},
    'title': 'Knockin' on Heaven's Door',
    'title_with_featured': 'Knockin' on Heaven's Door (Ft.\xa0\u200bThe
\xa0Waters)',
    'url': 'https://genius.com/Guns-n-roses-knockin-on-heavens-door-lyri
cs',
    'primary_artist': {'api_path': '/artists/637',
    'header_image_url': 'https://images.genius.com/6f9f5a6fb2f049bb3c02
f890a7a0a436.800x504x1.jpg',
    'id': 637,
    'image_url': 'https://images.genius.com/53ddc7640957b4279d9c234ab20
0adf4.1000x1000x1.jpg',
    'is_meme_verified': False,
    'is_verified': False,
    'name': 'Guns N' Roses',
    'url': 'https://genius.com/artists/Guns-n-roses'}},
    {'annotation_count': 10,
    'api_path': '/songs/63341',
    'artist_names': 'The Jimi Hendrix Experience',
    'full_title': 'All Along the Watchtower by\xa0The\xa0Jimi Hendrix Ex
perience',
    'header_image_thumbnail_url': 'https://images.genius.com/892e94dacb1
ac51070e55a7cffccf50a.300x300x1.jpg',
    'header_image_url': 'https://images.genius.com/892e94dacb1ac51070e55
a7cffccf50a.880x880x1.jpg',
    'id': 63341,
    'lyrics_owner_id': 31298,
    'lyrics_state': 'complete',
    'path': '/The-jimi-hendrix-experience-all-along-the-watchtower-lyric
s',
    'pyongs_count': 70,
    'song_art_image_thumbnail_url': 'https://images.genius.com/ff55dd642
026ce236b2488bb316bd98a.300x300x1.jpg',
    'song_art_image_url': 'https://images.genius.com/ff55dd642026ce236b2
488bb316bd98a.1000x1000x1.jpg',
    'stats': {'unreviewed_annotations': 0, 'hot': False, 'pageviews': 31
9163},
    'title': 'All Along the Watchtower',

```

```
    'title_with_featured': 'All Along the Watchtower',
    'url': 'https://genius.com/The-jimi-hendrix-experience-all-along-the-
-watchtower-lyrics',
    'primary_artist': {'api_path': '/artists/634985',
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    'lyrics_state': 'complete',
    'path': '/Bob-dylan-dont-think-twice-its-all-right-lyrics',
    'pyongs_count': 27,
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    'song_art_image_url': 'https://images.genius.com/afd28edb1b2d6d5d556
a7b01b108c716.500x500x1.jpg',
    'stats': {'unreviewed_annotations': 5,
    'concurrents': 3,
    'hot': False,
    'pageviews': 305882},
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    'title_with_featured': "Don't Think Twice, It's All Right",
    'url': 'https://genius.com/Bob-dylan-dont-think-twice-its-all-right-
lyrics',
    'primary_artist': {'api_path': '/artists/181',
    'header_image_url': 'https://images.genius.com/facc753d420efc53bbe1
e0b63a72d70b.960x719x1.jpg',
    'id': 181,
    'image_url': 'https://images.genius.com/22306423b6ad8777d1ed5b33ad8
b0d0b.1000x1000x1.jpg',
    'is_meme_verified': False,
    'is_verified': False,
    'name': 'Bob Dylan',
    'url': 'https://genius.com/artists/Bob-dylan'}}},
    {'annotation_count': 10,
    'api_path': '/songs/79749',
    'artist_names': 'Bob Dylan',
    'full_title': 'Make You Feel My Love by\xa0Bob\xa0Dylan',
    'header_image_thumbnail_url': 'https://images.genius.com/cd0a26733cc
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    'header_image_url': 'https://images.genius.com/cd0a26733cc459710d098
6b7b64de8f0.1000x1000x1.jpg',
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'id': 79749,
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'song_art_image_url': 'https://images.genius.com/cd0a26733cc459710d0986b7b64de8f0.1000x1000x1.jpg',
'stats': {'unreviewed_annotations': 3, 'hot': False, 'pageviews': 304289},
'title': 'Make You Feel My Love',
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'url': 'https://genius.com/Bob-dylan-make-you-feel-my-love-lyrics',
'primary_artist': {'api_path': '/artists/181',
'header_image_url': 'https://images.genius.com/facc753d420efc53bbe1e0b63a72d70b.960x719x1.jpg',
'id': 181,
'image_url': 'https://images.genius.com/22306423b6ad8777d1ed5b33ad8b0d0b.1000x1000x1.jpg',
'is_meme_verified': False,
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'url': 'https://genius.com/artists/Bob-dylan'}}},
{'annotation_count': 22,
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'header_image_url': 'https://images.genius.com/2ae7853a0fc26b8340cebea32df652ca.600x600x1.jpg',
'id': 87402,
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'lyrics_state': 'complete',
'path': '/Bob-dylan-hurricane-lyrics',
'pyongs_count': 24,
'song_art_image_thumbnail_url': 'https://images.genius.com/2df91ca57456e44cf67e1d30d25bb701.300x299x1.jpg',
'song_art_image_url': 'https://images.genius.com/2df91ca57456e44cf67e1d30d25bb701.567x566x1.jpg',
'stats': {'unreviewed_annotations': 8, 'hot': False, 'pageviews': 301024},
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'url': 'https://genius.com/Bob-dylan-hurricane-lyrics',
'primary_artist': {'api_path': '/artists/181',
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'url': 'https://genius.com/artists/Bob-dylan'}}},
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    'title_with_featured': 'Mr. Tambourine Man',
    'url': 'https://genius.com/Bob-dylan-mr-tambourine-man-lyrics',
    'primary_artist': {'api_path': '/artists/181',
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    'id': 181,
    'image_url': 'https://images.genius.com/22306423b6ad8777d1ed5b33ad8b0d0b.1000x1000x1.jpg',
    'is_meme_verified': False,
    'is_verified': False,
    'name': 'Bob Dylan',
    'url': 'https://genius.com/artists/Bob-dylan'}},
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    'artist_names': 'Bob Dylan',
    'full_title': 'A Hard Rain's A-Gonna Fall by\xa0Bob\xa0Dylan',
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    'header_image_url': 'https://images.genius.com/afd28edb1b2d6d5d556a7b01b108c716.500x500x1.jpg',
    'id': 105186,
    'lyrics_owner_id': 16,
    'lyrics_state': 'complete',
    'path': '/Bob-dylan-a-hard-rains-a-gonna-fall-lyrics',
    'pyongs_count': 24,
    'song_art_image_thumbnail_url': 'https://images.genius.com/afd28edb1b2d6d5d556a7b01b108c716.300x300x1.jpg',
    'song_art_image_url': 'https://images.genius.com/afd28edb1b2d6d5d556a7b01b108c716.500x500x1.jpg',
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    'url': 'https://genius.com/Bob-dylan-a-hard-rains-a-gonna-fall-lyrics',
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73a8a004af02b79495487.300x300x1.jpg',
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02b79495487.600x600x1.jpg',
 'id': 154239,
 'lyrics_owner_id': 10380,
 'lyrics_state': 'complete',
 'path': '/Darius-rucker-wagon-wheel-lyrics',
 'pyongs_count': 31,
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 'song_art_image_url': 'https://images.genius.com/2dae9fald992ffefce2
720300bb53840.300x300x1.jpg',
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 'title_with_featured': 'Wagon Wheel',
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 'id': 21867,
 'image_url': 'https://images.genius.com/0fc3950433f07df236e4337d78c
09551.400x400x1.jpg',
 'is_meme_verified': False,
 'is_verified': False,
 'name': 'Darius Rucker',
 'url': 'https://genius.com/artists/Darius-rucker'}}},
{'annotation_count': 19,
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a8e726359e0335bcff19c.300x300x1.jpg',
 'header_image_url': 'https://images.genius.com/2fb972dceb4a8e726359e
0335bcff19c.1000x1000x1.jpg',
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 'lyrics_owner_id': 4,
 'lyrics_state': 'complete',
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 'pyongs_count': 36,
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b4a8e726359e0335bcff19c.300x300x1.jpg',
 'song_art_image_url': 'https://images.genius.com/2fb972dceb4a8e72635
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 'stats': {'unreviewed_annotations': 1,
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    'url': 'https://genius.com/Bob-dylan-subterranean-homesick-blues-lyrics',
    'primary_artist': {'api_path': '/artists/181',
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        'id': 181,
        'image_url': 'https://images.genius.com/22306423b6ad8777d1ed5b33ad8b0d0b.1000x1000x1.jpg',
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        'is_verified': False,
        'name': 'Bob Dylan',
        'url': 'https://genius.com/artists/Bob-dylan'}}},
    {'annotation_count': 57,
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        'primary_artist': {'api_path': '/artists/181',
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            'id': 181,
            'image_url': 'https://images.genius.com/22306423b6ad8777d1ed5b33ad8b0d0b.1000x1000x1.jpg',
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            'name': 'Bob Dylan',
            'url': 'https://genius.com/artists/Bob-dylan'}}},
    {'annotation_count': 24,
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        'artist_names': 'Bob Dylan',
        'full_title': 'Tangled Up in Blue by\x0Bob\x0Dylan',
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'stats': {'unreviewed_annotations': 3, 'hot': False, 'pageviews': 15
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b0d0b.1000x1000x1.jpg',
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'is_verified': False,
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'url': 'https://genius.com/artists/Bob-dylan'}}},
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'url': 'https://genius.com/Bob-dylan-knockin-on-heavens-door-lyric
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'id': 181,
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'is_verified': False,

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    'name': 'Bob Dylan',
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 'header_image_url': 'https://images.genius.com/afd28edb1b2d6d5d556a7b01b108c716.500x500x1.jpg',
 'id': 62628,
 'lyrics_owner_id': 49202,
 'lyrics_state': 'complete',
 'path': '/Bob-dylan-masters-of-war-lyrics',
 'pyongs_count': 19,
 'song_art_image_thumbnail_url': 'https://images.genius.com/afd28edb1b2d6d5d556a7b01b108c716.300x300x1.jpg',
 'song_art_image_url': 'https://images.genius.com/afd28edb1b2d6d5d556a7b01b108c716.500x500x1.jpg',
 'stats': {'unreviewed_annotations': 2, 'hot': False, 'pageviews': 135904},
 'title': 'Masters of War',
 'title_with_featured': 'Masters of War',
 'url': 'https://genius.com/Bob-dylan-masters-of-war-lyrics',
 'primary_artist': {'api_path': '/artists/181',
 'header_image_url': 'https://images.genius.com/facc753d420efc53bbe1e0b63a72d70b.960x719x1.jpg',
 'id': 181,
 'image_url': 'https://images.genius.com/22306423b6ad8777d1ed5b33ad8b0d0b.1000x1000x1.jpg',
 'is_meme_verified': False,
 'is_verified': False,
 'name': 'Bob Dylan',
 'url': 'https://genius.com/artists/Bob-dylan'}}}],
'next_page': 2}
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In [55]: # These are all the data for one song  
songs = json_data['response']['songs']  
songs[:2]
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Out[55]: [{ 'annotation_count': 16,
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  'song_art_image_url': 'https://images.genius.com/51f9de13b1cb0010adb6b5c1d70a5bc1.1000x1000x1.jpg',
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    'image_url': 'https://images.genius.com/3fb2d9f68c911b5473399b97ef9427e6.768x768x1.jpg',
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    'url': 'https://genius.com/artists/Usa-for-africa' } },
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  'id': 5393247,
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  'lyrics_state': 'complete',
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  'pyongs_count': 36,
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  'song_art_image_url': 'https://images.genius.com/7fbaf838ffdf99315408faa29cb566ac.1000x1000x1.jpg',
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  'url': 'https://genius.com/Bob-dylan-murder-most-foul-lyrics',
  'primary_artist': { 'api_path': '/artists/181',
    'header_image_url': 'https://images.genius.com/facc753d420efc53bbe1e0b63a72d70b.960x719x1.jpg',
```

```

'id': 181,
'image_url': 'https://images.genius.com/22306423b6ad8777d1ed5b33ad8b0d0b.1000x1000x1.jpg',
'is_meme_verified': False,
'is_verified': False,
'name': 'Bob Dylan',
'url': 'https://genius.com/artists/Bob-dylan'}}}]

```

```

In [56]: # As shown above, loop through the data, and pick up title
# Place holder to append title
dylan_songs = []

for song in songs:
    dylan_songs.append(song['title'])

#Make a Pandas dataframe from a list
dylan_songs_df = pd.DataFrame(dylan_songs)
dylan_songs_df.columns = ['title']

# Display the dataframe
dylan_songs_df.head(20)

```

Out[56]:

	title
0	We Are the World
1	Murder Most Foul
2	Blowin' in the Wind
3	Make You Feel My Love
4	The Times They Are A-Changin'
5	All Along the Watchtower
6	Like a Rolling Stone
7	Knockin' on Heaven's Door
8	All Along the Watchtower
9	Don't Think Twice, It's All Right
10	Make You Feel My Love
11	Hurricane
12	Mr. Tambourine Man
13	A Hard Rain's A-Gonna Fall
14	Wagon Wheel
15	Subterranean Homesick Blues
16	Desolation Row
17	Tangled Up in Blue
18	Knockin' on Heaven's Door
19	Masters of War

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 [57]: #!pip install lyricsgenius
```

```
In [58]: import lyricsgenius
```

```
In [59]: # Example of looking up songs by the artist name:  
genius = lyricsgenius.Genius(ClientAccess)  
artist = genius.search_artist("Bob Dylan", max_songs=2, sort="title")
```

Searching for songs by Bob Dylan...

Song 1: "10,000 Men"

Song 2: "2 X 2"

Reached user-specified song limit (2).

Done. Found 2 songs.

```
In [60]: # Pulling lyrics of a specific song:
song = genius.search_song("Tangled Up in Blue", artist.name)
print(song.lyrics)
```

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

Tangled 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

[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