CodeActually
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What is an API?
An API or Application Programming Interface is something that a website or online service designs to make some of their data available to the public, for use in applications or other purposes. Most web services have an API – Facebook, Yelp, Twitter… they all have ways to access their public data. You usually have to do something to sign up for access to an API, and then you are granted access credentials to use in your code.

Using the Twitter API

We are going to use some existing files to work with the Twitter API that I have available on github https://github.com/cindyroyal/apifiles. Once you get the hang of what you are doing and what you can modify, you can use these scripts to do your own searches from Twitter. These scripts are written in Python, but you don't have to be a Python coder to use them. You just need to be able to follow along and make modifications.

You will need to install the OAuth 2 library. If you are doing this on your own computer, you will use your login password when you run this command.

Go to the Terminal:
```
$     sudo easy_install oauth2
```

You will find the files we are using at github.com/cindyroyal. Look for the apifiles repository for these first few examples.

For all files, you will need some identifying information from Twitter. Go to apps.twitter.com and sign up to make an app. You will get the information you need for the following items. Get your access credentials here: https://apps.twitter.com/. Choose Create New App.

consumer_key
consumer_secret
token_key
token_secret

You will use your own credentials in these scripts. Don't post your Twitter

keys to GitHub.

Basic Search
The tweet_basic.py script lets you work with the Twitter API to pull 100 most recent results from Twitter for a search term. This is Twitter's limit for a basic API call.

To run it, make sure you have the file on your computer and that you are in the folder for that file (cd to that folder). Make sure your credentials are in the script. You can open it in TextWrangler to check and add anything.

Then run it.

$ python tweet_basic.py

You will then see a .json file in your folder. You can use a json to csv converter like http://konklone.io/json/ to convert your file to a csv. Then you can read it into Excel.

More Advanced Search
You can use the tweet_mult_set.py file to get more results. This is a nice file because it prompts you for the search term and the number of results you want. Then it creates one file each for 100 tweets, each time it goes through the loop.

Make sure your credentials are in the script.

Run it

$ python tweet_mult_set.py

And respond to the prompts. Look at your folder for the files.

I also have a script that lets you convert your json files to csv. Use new_convert_to_csv.py and give it the name of the files to convert.

$ python new_convert_to_csv.py sxsw.json
The above is an example that converts files with sxsw in the name.

Then you can use a basic Terminal command to concatenate all these into one csv.

$ cat *csv > sxsw_combine.csv
Name the resulting file whatever you want. You can open this now in Excel.

Tag Crowd
The Tag Crowd site makes quick word visualizations. It's easy to use and flexible. Go to tagcrowd.com and insert your text. Then run the visualization. You may have to exclude common words before the visualization is meaningful. I like to show frequencies and display 100 words maximum. Play with the settings to get the right visualization for your topic.

Word Frequency
One of the things you might want to do is run a word frequency script to determine which words are used the most. This is similar to what sites like TagCrowd.com do when they want to visualize terms in a word cloud. But you can use a Python script to get word counts. You might want to use this in some manner in your analysis, like using the data in a chart on your site.

Find the wordfreq.py script in the apifiles repository on github.com/cindyroyal

Copy the text you want to analyze and put it in a txt file. Run this script in the Terminal with Python. It will ask for an input file (the txt file that includes your text) and an output file (what you want to name the file that will include the word counts. Give it a .txt extension).

```
$ python wordfreq.py
```

You can then open the file in spreadsheet program and sort the frequencies. Once you get past the common words like a, an, the, you will start to see meaningful words used in the text.

Fun with Music APIs
Spotify
Many services have APIs that you can access. Quite often, the APIs exist so that developers can create applications based on information from their data. Maybe someone is creating a new app that needs up-to-date Spotify data. This site shows a list of apps that connect with Spotify http://evolver.fm/2012/04/05/introducing-all-47-spotify-apps-for-your-iphone-good-and-bad-alike/.

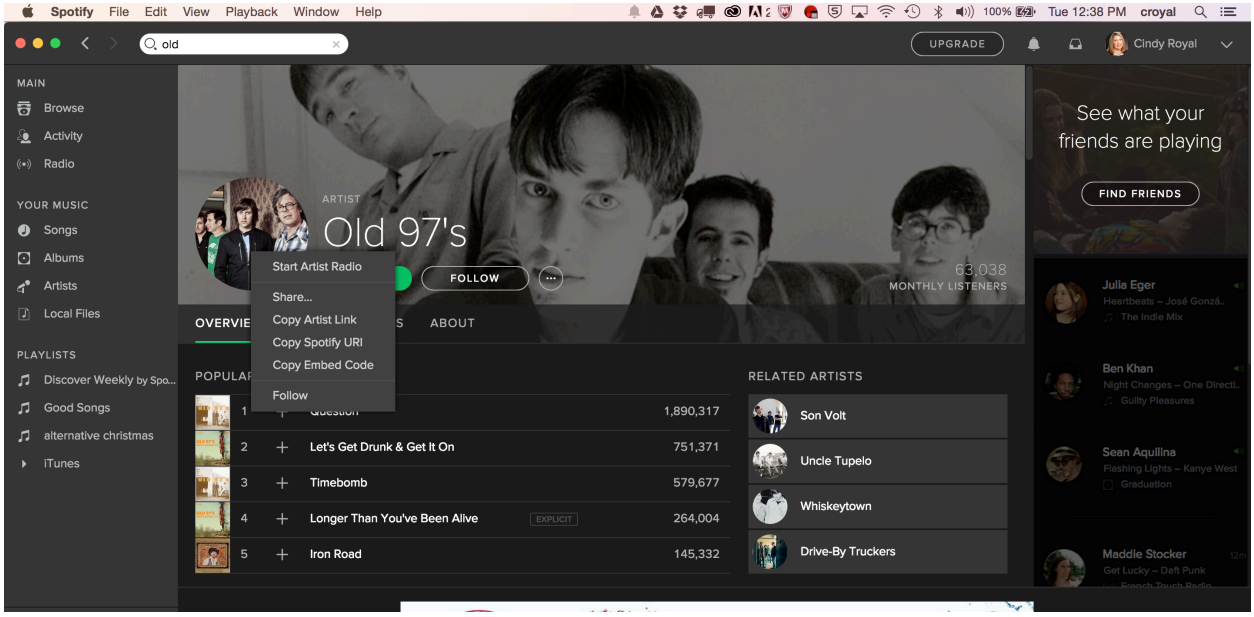
But you can also use APIs to grab data in the JSON format to use in projects. You might use the JSON data directly, as we did in the Interactive Charting Exercise. Or you might use http://konklone.io/json/ to convert json to csv, so you can explore the data in a spreadsheet before using it.

The Spotify API has a very nice, online interface that allows you to gain access to its data. In many cases, you don't need an access token, but it can improve speed. Just click on that button in the API to sign up to get one. In other cases, an access token is required – for things like getting a list of new releases or getting a category's playlist. If you want to get a user's information, then you have to use the authorization process that requires the user to accept their data for your application.

For your final project, you need to work with some data and visualize it. So, let's take a look at some things you might be interested in pursuing.

Spotify has a number of requests around artists and tracks. Some of these just get information about the artist or the track or a series of each. Not that interesting for our purposes. But it does have a Related Artists search that might be something to pursue in finding a few top Texas artists and seeing who their related artists are, who comes up most frequently.

For a Related Artist's search, go to https://developer.spotify.com/web-api/console/. Choose Get Artist's Related Artists. You need the Spotify ID for an artist. To get that, go to the Spotify application on your computer. You'll need the application and will need to login. But it's free. Search for an artist in the search bar.



One of my favorite bands is Old 97’s. On their page, click the … menu and then choose Share to find their URI. The alpha-numeric code at the end of that URI is the Spotify ID for that artist.

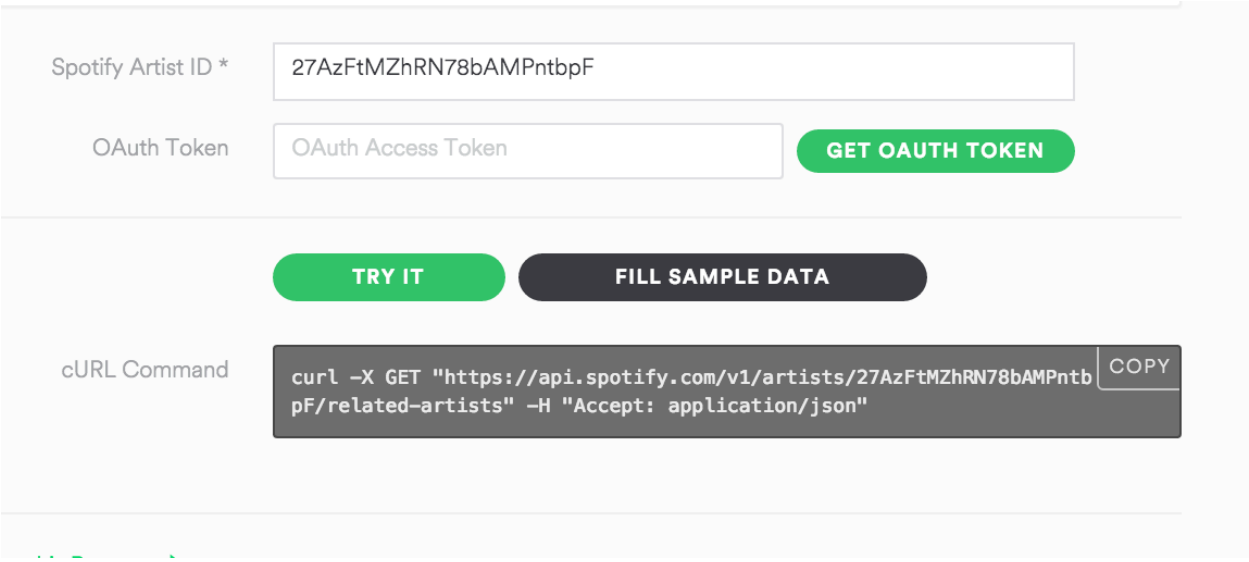
I can go back to the API interface and insert that as the ID. Click Try It and you should see the JSON of the Related Artists as determined by Spotify. Some actions require an Authorization Token, so just click that button. You will have to login to Spotify to get it.

Related Artists for Old 97s are bands like Son Volt, Jayhawks, Whiskeytown, Uncle Tupelo, etc. You can grab this and put it into a file or use a json to csv to convert it to something that can be read into a spreadsheet.

```
{
  "artists" : [ {
    "external_urls" : {
      "spotify" : "https://open.spotify.com/artist/7AhDVqsNA5q46WKsRPXvoe"
    },
    "followers" : {
      "href" : null,
      "total" : 12297
    },
    "genres" : [ "alternative country" ],
    "href" : "https://api.spotify.com/v1/artists/7AhDVqsNA5q46WKsRPXvoe",
    "id" : "7AhDVqsNA5q46WKsRPXvoe",
    "images" : [ {
      "height" : 667,
      "url" : "https://i.scdn.co/image/ccdc42f0af05732621e98319f241f3e48afb2909",
      "width" : 1000
    }, {
      "height" : 427,
      "url" : "https://i.scdn.co/image/1157b12749fb786875e6a4616656658d95aa3ab6",
      "width" : 640
    }, {
      "height" : 133,
      "url" : "https://i.scdn.co/image/4f67bb0a8b1d5b204cfbdacf5f420010b42d91e6",
      "width" : 200
    }, {
      "height" : 43,
      "url" : "https://i.scdn.co/image/3806de29344f8fbc45fde734680d58b65337eb6e",
      "width" : 64
    } ],
    "name" : "Son Volt",
    "popularity" : 42,
    "type" : "artist",
    "uri" : "spotify:artist:7AhDVqsNA5q46WKsRPXvoe"
  }, {
    "external_urls" : {
      "spotify" : "https://open.spotify.com/artist/2Plkkomsc4DKawkCioLKjc"
    },
    "followers" : {
      "href" : null,
      "total" : 16097
    },
    "genres" : [ "alternative country", "cowpunk" ],
    "href" : "https://api.spotify.com/v1/artists/2Plkkomsc4DKawkCioLKjc",
    "id" : "2Plkkomsc4DKawkCioLKjc",
    "images" : [ {
      "height" : 570,
      "url" : "https://i.scdn.co/image/416b7c1b04c2417c19dbdccedafbc31495a46e11",
      "width" : 1000
    }, {
      "height" : 365,
      "url" : "https://i.scdn.co/image/230ac552ceae96e29edb2f242844d672be276780",
      "width" : 640
    }, {
      "height" : 114,
      "url" : "https://i.scdn.co/image/f0f94009e16c446fa17c18eb8e077632addbe41e",
      "width" : 200
```


Also notice the box with the cURL script. This is script that can be run in the terminal to generate this json data, and can be used by an application. You can run this cURL script in the terminal to grab the data you want and directly output to a json file. Notice the –o and filename at the end of the command. Just run this in the terminal, and it will make your file. Then you can access it in your code or application.

i.e.
curl -X GET
"https://api.spotify.com/v1/artists/27AzFtMZhRN78bAMPntbpF/related-artists" -H "Accept: application/json" -o test.json



Other Spotify "endpoints" that might be interesting for you to explore include getting an Artist's Top Tracks (might do this for some Texas artists and make an app for that). Or you could do something where you search for an item (like several Texas artists) creating something that provides info on their tracks or albums.

Other endpoints need an OAuth token. This is very easy to get. If you are logged into Spotify, just click the Get OAUTH Token and go through the steps. Your token will automatically populate the field and allow you to use it. This is necessary for Get a List of New Releases or Browse a Category's Playlist. Your cURL command will include your access info, and you can generate the json file in the terminal.

Play with these different aspects of the Spotify API to see if you can come up with interesting data to use for your final project.

You can see example files for creating a Related Artists App at https://github.com/cindyroyal/relatedartists.