Spotify API Practice

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Introduction

Top 50 songs in the USA: https://open.spotify.com/playlist/37i9dQZEVXbLp5XoPON0wI

You've been tasked by a record label to collect Spotify data on the Top 50 Songs in the USA. Your job is to create a spreadsheet containing the release data, name of the song, name of the artist, name of the album, and the duration of the Top 50 songs.

- **Task 1:** Convert the Duration into minutes and add the results into a new column in the data table.
- **Task 2:** Without using code sort the songs in order of longest to shortest duration.
- **Task 3:** Store the modified data table into a new Excel file.

You will need an account to access the API, as you did in the previous livescript, feel free to go back to this video if needed.

Get Access Token

Copy in your ClientID and Client secret and run the code segment below as-is to get the access token.

```
% RUN THIS CODE AS IS
clc;clear;

% Set your client ID and client secret
clientID = 'Your ID'; % Replace with your actual client ID
clientSecret = 'Your Secret'; % Replace with your actual client secret

% Create the URL for token retrieval
url = 'https://accounts.spotify.com/api/token';

% Encode the client ID and client secret in base64
authString = matlab.net.base64encode([clientID ':' clientSecret]);

% Set the options for the HTTP request
options = weboptions('RequestMethod', 'post', 'MediaType', 'application/x-www-form-
urlencoded', ...
    'HeaderFields', {'Authorization', ['Basic ' authString]});
```

```
% Set the POST data
postData = 'grant_type=client_credentials';

% Make the POST request to retrieve the access token
response = webwrite(url, postData, options);

% Extract the access token from the response
Token = response.access_token;

% Display the access token (you can process it further as needed)
disp(['Access Token: ' Token]);
```

```
Access Token: BQDSq4oVeeBKHY_QpWuV1oznHwUUnTv053BfMe4mMIzeQNHYq5nHt2et-ZTsZM1DSz1ABWc7DeIKn6QARVLBBOUKmlOIZT7qFVWNy5
```

Create URL

Make the changes necessary to the ID & url variables. Use the interactive feature in the following link Web API Reference | Spotify for Developers to create the appropriate link to access the playlist. In the Market text box type **"US"** and in the Field text box type **"Tracks"**. The Request Sample will display the URL you need to use.

This URL is included in the code below, but it has some missing informatin. Fill in the missing information below to format the variable **"url"** correctly.

1. Copy in the playlist ID
2. Replace 'ENDPOINT' with the endpoint required to access playlists in the code below

Hint: Notice that the link to the playlist provides some of the infomation required by the API. From the link we know that the playlist ID is **'37i9dQZEVXbLp5XoPON0wI'**.

Look at the playlist endpoint under "Reference" on the Spotify for Developers website for help if needed. Web API Reference | Spotify for Developers

```
% Stores the playlist ID
playlistID = '37i9dQZEVXbLp5XoPON0wI';

% Constructs the URL for accessing the playlist
url = ['https://api.spotify.com/v1/playlists/', playlistID, '/?
market=US&fields=tracks'];
```

Retrieve Data

Run this section without making changes to retrieve the data from the Spotify API.

```
% Sets the options for the HTTP request
options = weboptions('HeaderFields', {'Authorization', ['Bearer ' Token]});

% Makes the GET request
```

```
response = webread(url, options);
```

Run the code below to extract the release date, name of the artist, track, album, and the duration of the track from the variable **"response"**. If you want to see what other information can be extracted explore the variable **"response"** by clicking it in the workspace. First you need to create empty arrays to store the data.

Fill in the empty **cell()** and **zeros()** functions to create arrays with 1 column and 50 rows.

```
% Initialize an empty arrays with 50 rows to store released date, artist names,
track, album, & duration
allArtists = cell(50, 1);
allTracks = cell(50,1);
allAlbums = cell(50,1);
allDurations = zeros(50,1);
allReleaseDates = cell(50,1);
```

Retrieve Data

If you look at the data stored in the **"response"** you will notice that most of the desired data is stored in a 50 individual structures called **"items"**. To access **"items"** use the dot notation **response.tracks.items(i).** The for loop below will go through each **"items"** structure to extracted the desired data for each song. For this example, the location of the data has been provided, but it is recommended that you open the **"response"** variable by clicking on it in the workspace to see how the data is stored within the variable.

Run the code segment below without making any changes.

```
% For loop with 50 iterations
for i = 1:50
    % Access the location of desired data using dot notation
    source = response.tracks.items(i);

    % Location of desired data within the source
    Artists = source.track.artists.name;
    Tracks = source.track.name;
    Albums = source.track.album.name;
    Durations = source.track.duration_ms;
    ReleaseDates = source.track.album.release_date;


    % Stores the data in the cell array
    allArtists{i} = Artists;
    allTracks{i} = Tracks;
    allAlbums{i} = Albums;
    allDurations(i) = Durations;
    allReleaseDates{i} = ReleaseDates;

end
```

Store Data

Now store the retrieved data in an excel file. First compile all the collected data in the 5 variables above into a table. Add a name for your excel file before running this segment of code for it to work.

Variables with retrieved data: **allArtists, allTracks, allAlbums, allDurations, allReleaseDates.**

```
% Create a table from the collected data
dataTable = table(allReleaseDates,allArtists, allTracks, allAlbums, allDurations,
...
    'VariableNames', {'Release Dates', 'Artists', 'Tracks', 'Albums', 'Durations'});

% Specify the filename for the Excel file
filename = 'TOP_50_USA.xlsx';

% Write the table to the Excel file
writetable(dataTable, filename);
```

Modify Data

Now write code to read the data in the newly created .xlsx file and complete the required tasks.

Task 1: Time Conversion & Add a New Column

Write code to store the excel data in a variable called Data. Then convert the duration of each song into minutes and store the results in a new column called **"ConvertedDurations".**

```
% Use the appropriate function to read the excel file
Data = readtable('TOP_50_USA.xlsx');
```

```
Warning: Column headers from the file were modified to make them valid MATLAB identifiers before creating
variable names for the table. The original column headers are saved in the VariableDescriptions property.
Set 'VariableNamingRule' to 'preserve' to use the original column headers as table variable names.
```

```
% Convert the time from milliseconds to minutes and store the results in a new
column
% Write your code below and do not use a ; to suppress your output
Data.ConvertedDurations = (Data.Durations/1000)/60
```

```
Data = 50×6 table
```

...

	ReleaseDates	Artists	Tracks
1	'2024-06-06'	'Sabrina Carpenter'	'Please Please Please'
2	'2024-04-12'	'Sabrina Carpenter'	'Espresso'
3	'2024-05-17'	'Billie Eilish'	'BIRDS OF A FEATHER'
4	'2024-05-10'	'Post Malone'	'I Had Some Help (Feat. Morgan Wallen)'
5	'2024-04-26'	'Tommy Richman'	'MILLION DOLLAR BABY'

	ReleaseDates	Artists	Tracks
6	'2024-05-04'	'Kendrick Lamar'	'Not Like Us'
7	'2024-05-31'	'Shaboozey'	'A Bar Song (Tipsy)'
8	'2024-04-05'	'Chappell Roan'	'Good Luck, Babe!'
9	'2024-05-24'	'Zach Bryan'	'Pink Skies'
10	'2024-03-22'	'Hozier'	'Too Sweet'
11	'2024-05-31'	'Eminem'	'Houdini'
12	'2024-05-17'	'Billie Eilish'	'LUNCH'
13	'2024-04-05'	'Benson Boone'	'Beautiful Things'
14	'2023-08-25'	'Zach Bryan'	'I Remember Everything (feat. Kacey Musgraves)'
15	'2024-03-22'	'Future'	'Like That'
16	'2024-05-17'	'Billie Eilish'	'CHIHIRO'
17	'2024-04-18'	'Taylor Swift'	'Fortnight (feat. Post Malone)'
18	'2023-09-15'	'Teddy Swims'	'Lose Control'
19	'2022-10-14'	'Noah Kahan'	'Stick Season'
20	'2023-09-22'	'Chappell Roan'	'HOT TO GO!'
21	'2023-03-03'	'Morgan Wallen'	'Cowgirls (feat. ERNEST)'
22	'2024-06-07'	'Koe Wetzel'	'High Road (feat. Jessie Murph)'
23	'2023-09-22'	'Chappell Roan'	'Red Wine Supernova'
24	'2024-06-14'	'Luke Combs'	'The Man He Sees in Me'
25	'2023-03-03'	'Morgan Wallen'	'Last Night'
26	'2024-05-23'	'Central Cee'	'BAND4BAND (feat. Lil Baby)'
27	'2024-04-05'	'Benson Boone'	'Slow It Down'
28	'2024-04-18'	'Taylor Swift'	'I Can Do It With a Broken Heart'
29	'2024-02-16'	'Dasha'	'Austin (Boots Stop Workin')'
30	'2024-03-19'	'Artemas'	'i like the way you kiss me'
31	'2023-03-17'	'Sabrina Carpenter'	'Feather'
32	'2024-02-02'	'FloyyMenor'	'Gata Only'
33	'2023-03-03'	'Morgan Wallen'	'You Proof'
34	'2024-05-10'	'Myles Smith'	'Stargazing'
35	'2024-03-08'	'Ariana Grande'	'we can't be friends (wait for your love)'
36	'2022-04-22'	'Zach Bryan'	'Something in the Orange'
37	'2024-02-22'	'SZA'	'Saturn'
38	'2023-03-03'	'Morgan Wallen'	'Thinkin’ Bout Me'

	ReleaseDates	Artists	Tracks
39	'2024-06-07'	'Gracie Abrams'	'Close To You'
40	'2019-08-23'	'Taylor Swift'	'Cruel Summer'
41	'2022-09-16'	'Djo'	'End of Beginning'
42	'2024-06-14'	'Don Toliver'	'BANDIT'
43	'2019-09-30'	'Zach Bryan'	'Heading South'
44	'2017-07-21'	'Tyler, The Creator'	'See You Again (feat. Kali Uchis)'
45	'2024-04-30'	'Kendrick Lamar'	'euphoria'
46	'2024-06-14'	'$uicideboy$'	'The Thin Grey Line'
47	'2024-05-17'	'Billie Eilish'	'WILDFLOWER'
48	'2024-01-12'	'Michael Marcagi'	'Scared To Start'
49	'2024-04-05'	'GloRilla'	'Yeah Glo!'
50	'2022-07-15'	'Sabrina Carpenter'	'Nonsense'

Task 2: Sort the Songs

First call the data table and sort the duration from longest to shortest without using code. Then copy the code that MATLAB suggests you use to modify the data table and store the new table in the variable "NewData"

Hint: Use the drop down button in each column header of the interactive data table.

```
% First call the data table
Data
```

```
Data = 50×6 table
```

...

	ReleaseDates	Artists	Tracks
1	'2024-06-06'	'Sabrina Carpenter'	'Please Please Please'
2	'2024-04-12'	'Sabrina Carpenter'	'Espresso'
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4	'2024-05-10'	'Post Malone'	'I Had Some Help (Feat. Morgan Wallen)'
5	'2024-04-26'	'Tommy Richman'	'MILLION DOLLAR BABY'
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9	'2024-05-24'	'Zach Bryan'	'Pink Skies'
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	ReleaseDates	Artists	Tracks
12	'2024-05-17'	'Billie Eilish'	'LUNCH'
13	'2024-04-05'	'Benson Boone'	'Beautiful Things'
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49	'2024-04-05'	'GloRilla'	'Yeah Glo!'
50	'2022-07-15'	'Sabrina Carpenter'	'Nonsense'

```
NewData = sortrows(Data, "Durations", "descend");
```

Task 3: Store Modified Data

Write code to store the table **"NewData"** into a new excel file with the name "Top_50_USA_v2"

Hint: See the Store Data section above to identify which is used to create an excel file.

```
% Write the table to the Excel file
writetable(NewData, 'Top_50_USA_v2.xlsx');
```