MLDS 422 – Fall 2023
Homework 3
Due Friday, 10/13/23 at 11:59pm

Exercise 1: OOP Practice

1. Create an **AudioFile** class with the following:
    - Passed in attributes: **title**, **artist**, **duration_in_seconds**
    - Default attributes: play_count = 0, like = False

   Write a constructor to initialize the passed in and default attributes.

2. Define the following methods:
    - **print_audio_details** that prints the title, artist and play_count in a reader-friendly way like "Imagine by The Beatles | Play Count: 0"
    - **heart** that will change the like value to True
    - **unheart** that will change the like value to False
    - **play** that will increase the play_count by 1

3. Create a subclass called **Song** that inherits from the **AudioFile** class, and has:
    - An additional **lyrics** attribute that's passed in
    - An additional **words_per_minute** method that makes a calculation

   Create an instance of the class using a song you like. Print out the song's details using the inherited method **print_audio_details**. Print out the **words per minute** as well.

4. Create a subclass called **Podcast** that inherits from the **AudioFile** class, and has:
    - An additional **transcript** attribute that's passed in
    - An additional **words_per_minute** method that makes a calculation

   Create an instance of the class using a podcast you like. Print out the podcast's details using the inherited method **print_audio_details**. Print out the **words per minute** as well.

5. Create three more audio files in addition to the ones you created in steps 3 and 4, and store all five in a list called **audio_list**
    - Write a loop to call **print_audio_details** on all five of them

6. Write a function that will play a total of 30 audio files (from the five you created) in a random order. Now print the audio details of all five audio files.

7. Check the **like** attribute of all five audio files in the list. Heart the most played audio file. Check the **like** attribute values again.

8. Create a **Playlist** class that has a **playlist_name** attribute and takes in a list of **AudioFiles**
    - Create a constructor
    - Create a method called **print_playlist_details** that prints the playlist_name and lists the audio files it contains in a reader-friendly way

    Create a new playlist instance, add a few songs and print the details.

Exercise 2: Pandas Practice

Read the four baseball flat files into four Pandas DataFrames.

1. Which ten schools have generated the most players?

2. What was the total spent on salaries by each team, each year? What were the top 3 highest spend teams / years and the bottom 3 highest spend teams / years?

3. What is the average weight and height of players each year? How has this changed over time?

4. For each team, what percent of players bat right vs left vs both?

5. Which 10 players have the longest careers? Assume that the debut and finalGame columns comprise the start and end, respectively, of a player's career.

6. Plot the distribution of debut months.

7. What are two more insights you can extract from the data using Pandas?