Department of Computer Science and Engineering PES University, Bangalore, India

Python for Computational Problem Solving - UE24CS151A

Problem Statement: Level-1 (Banana)

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Date: 7thNovember, 2024
Timing:1:45PM to 4:00PM

Problem Statement: Music Album Collection

Given a dataset of music albums in a file, where each row contains three columns: **Genre**, **Artist**, and **Album Title**, answer the following questions with a Python program:

1. Count the total number of albums in the dataset.
2. Add a new album to the dataset. Include details for each of the following: Genre, Artist, Album Title
    a. Rock, Rolling Stones, Exile On Main Street
    b. Rock, Bob Dylan, Highway 61 Revisited
    c. Rock, Santana, Supernatural
3. Identify any duplicate entries in the dataset and remove them.
4. For each artist, count how many albums they have released in each genre.
5. Remove a specific album entry for a particular artist from the dataset.
6. Sort all albums alphabetically by their titles.

Optional tasks:

7. Remove all entries for a specified genre from the dataset.
8. List all albums associated with each artist.

Dataset 3: Music Album Collection (albums.txt)

Rock, Led Zeppelin, Led Zeppelin IV
Rock, Pink Floyd, The Dark Side of the Moon
Pop, Michael Jackson, Thriller
Rock, The Beatles, Abbey Road
Rock, Nirvana, Nevermind
Jazz, Miles Davis, Kind of Blue
Pop, Madonna, Like a Virgin
Jazz, John Coltrane, A Love Supreme

Pop, Taylor Swift, 1989
Rock, Nirvana, Nevermind
Jazz, Miles Davis, Kind of Blue
Jazz, Herbie Hancock, Head Hunters

Methodology:

Load the Dataset- Load the dataset from a file into a variable for easier manipulation.
Data Exploration- Explore the dataset.
Detailed Analysis- Make sure you know the significance of each column and a row in a given dataset.

Implementation:

- Language: Python 3.10 or above.
- Use data structures such as lists, sets and dicts to store and organize the data.
- Use/write appropriate functions- Specific to Data structures and also user defined functions for each functionality.
- Make use of operators, loops and conditionals

Expected Output for all sub-problems:

```
Menu:
1. Count total albums
2. Add a new album
3. Remove duplicate entries
4. Count albums by each artist in each genre
5. Remove a specific artist's album
6. Sort albums by title
7. Delete all albums from a particular genre
8. Display albums by artist
9. Exit
```

Subproblem1

```
Enter your choice: 1
12
```

Subproblem2

```
Enter your choice: 2
Enter genre: Rock
Enter artist: Rolling Stones
Enter album title: Exile On Main Street
['Rock', 'Rolling Stones', 'Exile On Main Street'] album(s) added successfully.
```

Please open the file named "albums.txt" to check the added entry.

Rock, Led Zeppelin, Led Zeppelin IV
Rock, Pink Floyd, The Dark Side of the Moon
Pop, Michael Jackson, Thriller
Rock, The Beatles, Abbey Road
Rock, Nirvana, Nevermind
Jazz, Miles Davis, Kind of Blue
Pop, Madonna, Like a Virgin
Jazz, John Coltrane, A Love Supreme
Pop, Taylor Swift, 1989
Rock, Nirvana, Nevermind
Jazz, Miles Davis, Kind of Blue
Jazz, Herbie Hancock, Head Hunters
Rock, Rolling Stones, Exile On Main Street

Subproblem3

Enter your choice: 3
Duplicates removed successfully.

Please open the file named "albums.txt" to check.

Rock, Led Zeppelin, Led Zeppelin IV
Rock, Pink Floyd, The Dark Side of the Moon
Pop, Michael Jackson, Thriller
Rock, The Beatles, Abbey Road
Rock, Nirvana, Nevermind
Jazz, Miles Davis, Kind of Blue
Pop, Madonna, Like a Virgin
Jazz, John Coltrane, A Love Supreme
Pop, Taylor Swift, 1989
Jazz, Herbie Hancock, Head Hunters
Rock, Rolling Stones, Exile On Main Street

Subproblem4

Enter your choice: 4
Artist: Led Zeppelin
 Genre: Rock, Albums: 1
Artist: Pink Floyd
 Genre: Rock, Albums: 1
Artist: Michael Jackson
 Genre: Pop, Albums: 1

```
Artist: The Beatles
  Genre: Rock, Albums: 1
Artist: Nirvana
  Genre: Rock, Albums: 1
Artist: Miles Davis
  Genre: Jazz, Albums: 1
Artist: Madonna
  Genre: Pop, Albums: 1
Artist: John Coltrane
  Genre: Jazz, Albums: 1
Artist: Taylor Swift
  Genre: Pop, Albums: 1
Artist: Herbie Hancock
  Genre: Jazz, Albums: 1
Artist: Rolling Stones
  Genre: Rock, Albums: 1
```

Subproblem5

```
Enter your choice: 5
Enter artist name: Pink Floyd
All albums by 'Pink Floyd' have been removed successfully.
```

Please open the file named "albums.txt" to check.

```
Rock, Led Zeppelin, Led Zeppelin IV
Pop, Michael Jackson, Thriller
Rock, The Beatles, Abbey Road
Rock, Nirvana, Nevermind
Jazz, Miles Davis, Kind of Blue
Pop, Madonna, Like a Virgin
Jazz, John Coltrane, A Love Supreme
Pop, Taylor Swift, 1989
Jazz, Herbie Hancock, Head Hunters
Rock, Rolling Stones, Exile On Main Street
```

Subproblem6

```
Enter your choice: 6
[{'genre': 'Pop', 'artist': 'Taylor Swift', 'album': '1989'}, {'genre': 'Jazz', 'artist': 'John Coltrane', 'album': 'A Love Supreme'}, {'genre': 'Rock', 'artist': 'The Beatles', 'album': 'Abbey Road'}, {'genre': 'Rock', 'artist': 'Rolling Stones', 'album': 'Exile On Main Street'}, {'genre': 'Jazz', 'artist':
```

'Herbie Hancock', 'album': 'Head Hunters'}, {'genre': 'Jazz', 'artist': 'Miles Davis', 'album': 'Kind of Blue'}, {'genre': 'Rock', 'artist': 'Led Zeppelin', 'album': 'Led Zeppelin IV'}, {'genre': 'Pop', 'artist': 'Madonna', 'album': 'Like a Virgin'}, {'genre': 'Rock', 'artist': 'Nirvana', 'album': 'Nevermind'}, {'genre': 'Pop', 'artist': 'Michael Jackson', 'album': 'Thriller'}]

Subproblem7

```
Enter your choice: 7
Enter genere: Pop
All albums from genre 'Pop' have been removed successfully.
```

Please open the file named "albums.txt" to check.

```
Rock, Led Zeppelin, Led Zeppelin IV
Rock, The Beatles, Abbey Road
Rock, Nirvana, Nevermind
Jazz, Miles Davis, Kind of Blue
Jazz, John Coltrane, A Love Supreme
Jazz, Herbie Hancock, Head Hunters
Rock, Rolling Stones, Exile On Main Street
```

Subproblem8

```
Enter your choice: 8
Enter artist name: Rolling Stones
Albums by Rolling Stones:
Exile On Main Street (Rock)
```

```
Enter your choice: 9
Process finished with exit code 0
```

Submission Mode:

Google form link: https://forms.gle/HxhqS66jXxR4Xhfj8 . Choose the correct section you belong to in the current semester.

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