

CD Inventory Program using Dictionary

Introduction

In this module, I learned about a new sequence type: dictionary. One of the differences between a dictionary data type and other store data types is that it is a mapping type. That means we cannot access the data via indexes. Instead of indexes, we need to define a key under which the value is being stored. Applying my knowledge to assignment 5, I have created the following program.

Step-by-Step

First of all, I declare the variables that I am going to use:

1. strChoice - an empty variable that stores the user's input
2. lstTbl - list of dictionaries to hold data
3. dicRow - dictionary of data
4. strFileName - file where I store the data
5. objFile - file object

```
1  #-----#
2  # Title: CDInventory.py
3  # Desc: CDInventory to store CD Inventory data
4  # Change Log: (Who, When, What)
5  # DBiesinger, 2030-Jan-01, Created File
6  # MKot, 2022-Nov-11, Modified Code, replace the inner data structure by dictionaries;
7  #                                     add the functionality of loading existing data;
8  #                                     add functionality of deleting an entry.
9  #-----#
10
11 # Declare variables
12
13 strChoice = '' # User input
14 lstTbl = [] # list of dict to hold data
15 dicRow = {} # dict of data row
16 strFileName = 'CDInventory.txt' # data storage file
17 objFile = None # file object
18
```

Figure 1 - Variables

Next, I start with the *'while'* loop, so that the program runs till the user decides to stop it. After each completed step ('Add CD', 'Display Current Inventory', or "Save Inventory", 'Load data from the File') the program keeps running and prompts the user to choose more operations

or to quit the program. Row 28 through row 31 consists of the first *'if'* statement for when the user wants to exit the program. *'Break'* function will stop the *'while'* loop and quit the program.

```

19 # Get user Input
20 print('The Magic CD Inventory\n')
21 while True:
22     # 1. Display menu allowing the user to choose:
23     print('\n[l] load Inventory from file\n[a] Add CD\n[i] Display Current Inventory')
24     print('\n[d] delete CD from Inventory\n[s] Save Inventory to file\n[x] exit')
25     strChoice = input('\n l, a, i, d, s or x: ').lower() # convert choice to lower case at time
26     print()
27
28     if strChoice == 'x':
29         # 2. Exit the program if the user chooses so
30         print('You have exited the program.')
31         break
32

```

Figure 2 - Beginning of the program

The next block of *'elif'* is the functionality of adding the user's entry into the memory. I assign the data that the user entered into the variable *dicRow*, which has a dictionary type. *'ID'*, *'Title'*, and *'Artist'* are the keys of the dictionary and the user enters are the variables. After that, I add *dicRow* (dictionary) into *lstTbl* (list), creating a list of dictionaries. Function *append()* allows us to add multiple entries and they all will be stored in the memory, in *lstTbl*.

```

33 elif strChoice == 'a': # no elif necessary, as this code is only reached if strChoice is not
34     # 4. Add data to the table (2d-list) each time the user wants to add data
35     intID = int(input('Enter an ID: '))
36     strTitle = input('Enter the CD's Title: ')
37     strArtist = input('Enter the Artist's Name: ')
38     dicRow = {'ID': intID, 'Title': strTitle, 'Artist': strArtist}
39     lstTbl.append(dicRow)
40

```

Figure 3 - Adding data

After entering the data we can see that it has been stored in the memory by the next script. *'For'* loop accesses each saved row from the memory (*lstTbl*) and then prints out the values of each row which are the values of the dictionary.

```

41 elif strChoice == 'i':
42     # 5. Display the current data from the memory to the user each time the user wants to d
43     print('ID, CD Title, Artist')
44     for row in lstTbl:
45         print(*row.values(), sep = ',')
46

```

Figure 4 - Displaying data from memory

Here is the output of doing so.

```

l, a, i, d, s or x: a

Enter an ID: 1
Enter the CD's Title: The Big Wheel
Enter the Artist's Name: Runrig

[l] load Inventory from file
[a] Add CD
[i] Display Current Inventory
[d] delete CD from Inventory
[s] Save Inventory to file
[x] exit

l, a, i, d, s or x: a

Enter an ID: 2
Enter the CD's Title: Bad
Enter the Artist's Name: Michael Jackson

[l] load Inventory from file
[a] Add CD
[i] Display Current Inventory
[d] delete CD from Inventory
[s] Save Inventory to file
[x] exit

l, a, i, d, s or x: i

ID, CD Title, Artist
1,The Big Wheel,Runrig
2,Bad,Michael Jackson

```

Figure 5 - Adding and Displaying data from memory (Output)

Next functionality of to delete from the memory. For that, I ask the user to enter the ID that he/she wants to delete and assign that entry to the variable *delRow*. After that, as *lstTbl* is a list, I can access each row of it by index. I start the *'for'* loop that finds the row where the *'ID'*

equals the value that the user entered and deletes that row. The main point of this program for me was that we only delete the data from the memory and not from the file.

```

47     elif strChoice == 'd':
48         # 6. Delete the entry from the memory
49         delRow = int(input('Enter the ID number of the entry you want to delete: '))
50         for i in range(len(lstTbl)):
51             if lstTbl[i]['ID'] == delRow:
52                 del lstTbl[i]
53                 print('Your entry has been deleted.')
54

```

Figure 6 - Deleting data from memory

```

Enter the ID number of the entry you want to delete: 2
Your entry has been deleted.

[l] load Inventory from file
[a] Add CD
[i] Display Current Inventory
[d] delete CD from Inventory
[s] Save Inventory to file
[x] exit

l, a, i, d, s or x: i

ID, CD Title, Artist
1,The Big Wheel,Runrig

```

Figure 7 - Deleting data from memory (Output)

Another functionality is to save the data from memory to the file. I use the character 'w' so that the program will rewrite the file and save everything that is in the memory without creating a duplicate of the records. I assign an empty value to the new variable 'strRow', then, using a 'for' loop I go through each item in 'row', convert it into a string, add a trailing character ',' and assign that back to the variable 'strRow'. In the next line of code, I take all characters from 'strRow' except for the last one (a come), add '\n' (which ends the line), and assign the result back to 'strRow'. This way the second record is saved on a separate row in the .txt file.

```

55     elif strChoice == 's':
56         # 7. Save the data to a text file CDInventory.txt if the user chooses so
57         objFile = open(strFileName, 'w')
58         strRow = ''
59         for row in lstTbl:
60             strRow = ''
61             for item in row.values():
62                 strRow += str(item) + ','
63             strRow = strRow[:-1] + '\n'
64             objFile.write(strRow)
65         objFile.close()
66         print('\nYour entry was saved.')
67

```

Figure 8 - Saving the data to the file

The last functionality is to load the data from the file to the memory. First, we need to clean the memory to load the data from the file into it. After that, I open the file in 'read' mode, go through each row and, by using function *strip()*, return a copy of the string by removing both the leading and the trailing characters. Function *split()* separate each character with ','. After that, I create a dictionary *dicRow* and combine each dictionary into a list of dictionary *lstTbl*. Now we have data file stored in the memory of our program.

```

67     elif strChoice == 'l':
68         # 7. Loading existing data from the file to the memory
69         lstTbl.clear()
70         objFile = open(strFileName, 'r')
71         for row in objFile:
72             lstRow = row.strip().split(',')
73             dicRow = {'ID': int(lstRow[0]), 'Title': lstRow[1], 'Artist': lstRow[2]}
74             lstTbl.append(dicRow)
75         objFile.close()
76
77     else:
78         print('Invalid Entry! Please choose either l, a, i, d, s or x!')
79

```

Figure 9 - Loading data from the file into the memory

Results

Here are some results from running this program in Spyder and Terminal.

<pre>The Magic CD Inventory [l] load Inventory from file [a] Add CD [i] Display Current Inventory [d] delete CD from Inventory [s] Save Inventory to file [x] exit l, a, i, d, s or x: a Enter an ID: 1 Enter the CD's Title: The Big Wheel Enter the Artist's Name: Runrig [l] load Inventory from file [a] Add CD [i] Display Current Inventory [d] delete CD from Inventory [s] Save Inventory to file [x] exit l, a, i, d, s or x: a Enter an ID: 2 Enter the CD's Title: Bad Enter the Artist's Name: Michael Jackson [l] load Inventory from file [a] Add CD [i] Display Current Inventory [d] delete CD from Inventory [s] Save Inventory to file [x] exit l, a, i, d, s or x: i ID, CD Title, Artist 1,The Big Wheel,Runrig 2,Bad,Michael Jackson [l] load Inventory from file [a] Add CD [i] Display Current Inventory [d] delete CD from Inventory [s] Save Inventory to file [x] exit l, a, i, d, s or x: s Your entry was saved.</pre>	<pre>l, a, i, d, s or x: a Enter an ID: 3 Enter the CD's Title: Mamma Mia Enter the Artist's Name: ABBA [l] load Inventory from file [a] Add CD [i] Display Current Inventory [d] delete CD from Inventory [s] Save Inventory to file [x] exit l, a, i, d, s or x: i ID, CD Title, Artist 1,The Big Wheel,Runrig 2,Bad,Michael Jackson 3,Mamma Mia,ABBA [l] load Inventory from file [a] Add CD [i] Display Current Inventory [d] delete CD from Inventory [s] Save Inventory to file [x] exit l, a, i, d, s or x: s Your entry was saved. [l] load Inventory from file [a] Add CD [i] Display Current Inventory [d] delete CD from Inventory [s] Save Inventory to file [x] exit l, a, i, d, s or x: l ID, CD Title, Artist 1,The Big Wheel,Runrig 2,Bad,Michael Jackson [l] load Inventory from file [a] Add CD [i] Display Current Inventory [d] delete CD from Inventory [s] Save Inventory to file [x] exit l, a, i, d, s or x: x You have exited the program.</pre>	<pre>l, a, i, d, s or x: d Enter the ID number of the entry you want to delete: 3 Your entry has been deleted. [l] load Inventory from file [a] Add CD [i] Display Current Inventory [d] delete CD from Inventory [s] Save Inventory to file [x] exit l, a, i, d, s or x: s Your entry was saved. [l] load Inventory from file [a] Add CD [i] Display Current Inventory [d] delete CD from Inventory [s] Save Inventory to file [x] exit l, a, i, d, s or x: l ID, CD Title, Artist 1,The Big Wheel,Runrig 2,Bad,Michael Jackson [l] load Inventory from file [a] Add CD [i] Display Current Inventory [d] delete CD from Inventory [s] Save Inventory to file [x] exit l, a, i, d, s or x: x You have exited the program.</pre>
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The Magic CD Inventory

```
[
[1] load Inventory from file
[a] Add CD
[i] Display Current Inventory
[d] delete CD from Inventory
[s] Save Inventory to file
[x] exit

1, a, i, d, s or x: a

Enter an ID: 1
Enter the CD's Title: The Big Wheel
Enter the Artist's Name: Runrig

[1] load Inventory from file
[a] Add CD
[i] Display Current Inventory
[d] delete CD from Inventory
[s] Save Inventory to file
[x] exit

1, a, i, d, s or x: a

Enter an ID: 2
Enter the CD's Title: Bad
Enter the Artist's Name: Michael Jackson

[1] load Inventory from file
[a] Add CD
[i] Display Current Inventory
[d] delete CD from Inventory
[s] Save Inventory to file
[x] exit

1, a, i, d, s or x: s

Your entry was saved.

[1] load Inventory from file
[a] Add CD
[i] Display Current Inventory
[d] delete CD from Inventory
[s] Save Inventory to file
[x] exit

1, a, i, d, s or x: i

ID, CD Title, Artist
1,The Big Wheel,Runrig
2,Bad,Michael Jackson

[1] load Inventory from file
[a] Add CD
[i] Display Current Inventory
[d] delete CD from Inventory
[s] Save Inventory to file
[x] exit

1, a, i, d, s or x: a

Enter an ID: 3
Enter the CD's Title: Mamma Mia
Enter the Artist's Name: ABBA

[1] load Inventory from file
[a] Add CD
[i] Display Current Inventory
[d] delete CD from Inventory
[s] Save Inventory to file
[x] exit

1, a, i, d, s or x: s

Your entry was saved.
```

```
1, a, i, d, s or x: l

[1] load Inventory from file
[a] Add CD
[i] Display Current Inventory
[d] delete CD from Inventory
[s] Save Inventory to file
[x] exit

1, a, i, d, s or x: i

ID, CD Title, Artist
1,The Big Wheel,Runrig
2,Bad,Michael Jackson
3,Mamma Mia,ABBA

[1] load Inventory from file
[a] Add CD
[i] Display Current Inventory
[d] delete CD from Inventory
[s] Save Inventory to file
[x] exit

1, a, i, d, s or x: d

Enter the ID number of the entry you want to delete: 3
Your entry has been deleted.

[1] load Inventory from file
[a] Add CD
[i] Display Current Inventory
[d] delete CD from Inventory
[s] Save Inventory to file
[x] exit

1, a, i, d, s or x: i

ID, CD Title, Artist
1,The Big Wheel,Runrig
2,Bad,Michael Jackson

[1] load Inventory from file
[a] Add CD
[i] Display Current Inventory
[d] delete CD from Inventory
[s] Save Inventory to file
[x] exit

1, a, i, d, s or x: s

Your entry was saved.

[1] load Inventory from file
[a] Add CD
[i] Display Current Inventory
[d] delete CD from Inventory
[s] Save Inventory to file
[x] exit

1, a, i, d, s or x: l

[1] load Inventory from file
[a] Add CD
[i] Display Current Inventory
[d] delete CD from Inventory
[s] Save Inventory to file
[x] exit

1, a, i, d, s or x: i

ID, CD Title, Artist
1,The Big Wheel,Runrig
2,Bad,Michael Jackson

[1] load Inventory from file
[a] Add CD
[i] Display Current Inventory
[d] delete CD from Inventory
[s] Save Inventory to file
[x] exit

1, a, i, d, s or x: x

You have exited the program.
```

Summary

In this assignment, I have worked with dictionaries, understood how to access each element of it, and what special functions they have. I learned how to store the data in the file and how to access it. I understood the flow of the data in memory and how to manipulate it.

My GitHub : <https://github.com/mustbekot/Assignment05>