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Foundations of Programming, Python

Assignment 05

Modifying the Python CD Inventory program

Introduction

In this assignment I will explain the steps I used to modify and extend the provided Python code in CDInventory_Starter.py.

Modifying and extending Python Script and running in Spyder IDE

Working with dictionaries

This week Assignment05 was modifying the given 2D data structure while using dictionaries instead of lists. First, I spent some time reviewing the code, to make sure I understood what the code was doing, then to be able to modify it. The given starter code was very similar to my previous assignment. It was a CD inventory program that contains a menu with these options: adding cd, displaying current inventory, deleting cd from inventory, saving inventory to a .txt file, loading/reading inventory from a .txt file and exit. I run the given code in Spyder to make sure the menu is working properly. I was very careful not to delete any of the previous programmer's notes. Next step that I took was changing the lists with dictionaries, so when a user is adding data (id, title and artist) that data saves in dictionary (dicRow, that is my dictionary row), and each dictionary saves into list (lstTable, that is my list of dictionaries). See Figure 1.

```
strChoice = '' # User input
lstTbl = [] # list of lists to hold data
# TODO replace list of lists with list of dicts
lisRow = {} # dictionary of data row
dicRow = {} # dictionary of data row
strFileName = 'CDInventory.txt' # data storage file
objFile = None # file object
# Get user Input
print('\nThe Magic CD Inventory\n')
while True:
# Display menu allowing the user to choose:
   strChoice = input('a, i, d, s, l or x: ').lower() # convert choice to lower case at time of input
# 6. Exit the program if the user chooses so
   if strChoice == 'x':
    if strChoice == 'a': # no elif necessary, as this code is only reached if strChoice is not 'exit'
   intID = int(input('Enter an ID: '))
       strTitle = input('Enter the CD\'s Title: ')
       strArtist = input('Enter the Artist\'s Name: ')
       dicRow = {'id': intID, 'title': strTitle, 'artist': strArtist}
       lstTbl.append(dicRow)
```

Figure 1 – Add data to a table using dictionary

```
Enter an ID: 1

Enter the CD's Title: The Big Wheel

Enter the Artist's Name: Runrig
[a] Add CD
[i] Display Current Inventory
[d] Delete CD from Inventory
[s] Save Inventory to file
[l] Load Inventory from file
[x] Exit

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

Enter an ID: 2

Enter the CD's Title: Bad

Enter the Artist's Name: Michael Jackson
```

Delete CD from Inventory

For the menu option 'Delete CD from inventory', I knew that I could use For Loop to read the IstTbl , to go through each dictionary in the table, to find the key you would love to delete, and then delete the dictionary (in my case dicRow). Adding input() function was easy, where user can add id for delete. The real struggle was how to remove the dictionary from the list of dictionaries. After a little research I found a method using del in For Loop, this is the article, https://www.geeksforgeeks.org/python-removing-dictionary-from-list-of-dictionaries/

```
# 3. Delete CD from Inventory
  elif strChoice == 'd':
    # TODO Add functionality of deleting an entry
    deleteId = int(input('Enter id that would love to delete'))
    # using del + loop, deleting dictionary in list
    for row in range(len(lstTbl)):
        if lstTbl[row]['id'] == deleteId:
            del lstTbl[row]
            break
    print('\n The dictionary is successfully deleted! \n', lstTbl)
```

Figure 2 – Delete CD from inventory

```
Console 1/A X

[A] CALL

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

Enter id that would love to delete3

The dictionary is successfully deleted!

[a] Add CD

[i] Display Current Inventory

[d] Delete CD from Inventory

[s] Save Inventory to file

[l] Load Inventory from file

[x] Exit

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

ID, CD Title, Artist

1, The big wheel, Runrig

2, Bad, Michael Jackson

4, Jazz Summer Hits 2022, Jazz artists

Displayed current Invetory!
```

Displaying CD inventory program

Displaying the current data to the user each time the user wants to display data was easy to implement, just with using one For Loop and printing each dictionary key. See Figure 3

```
# 2. Display the current data to the user each time the user wants to display the data
    elif strChoice == 'i':
        print('ID, CD Title, Artist')
        for row in lstTbl:
            print(str(row['id']) + ',\t' + row['title'] + ',\t' + row['artist'] + '\n')
        print('\n Displayed current Invetory! \n')
```

Figure 3 – Display the current data

```
[a] Add CD
[i] Display Current Inventory
[d] Delete CD from Inventory
[s] Save Inventory to file
[l] Load Inventory from file
[x] Exit

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

ID, CD Title, Artist
1, The big wheel, Runrig

2, Bad, Michael Jackson

4, Jazz Summer Hits 2022, Jazz artists

Displayed current Invetory!
```

Write and read data to/from .txt file

For writing data to a CDInventory.txt I used the same logic that I used for displaying data, just adding the commands for writing to a .txt file: open() function, write() method and close() method.

For loading inventory data from a file I used strip() and split() methods. The strip() method in python removes whitespaces from the beginning or end of a string, and the split() method splits a string, than add to dictionary. Then from a dictionary the rows are appending to a table.

See Figure 4.

```
elif strChoice == 's':
    objFile = open(strFileName, 'w')
    for row in lstTbl:
        objFile.write(str(row['id']) + ', ' + row['title'] + ', ' + row['artist'] + '\n')
    objFile.close()
    print('\n Saved inventory to a file! \n')
elif strChoice == 'l':
# TODO Add the functionality of loading existing data
    lstTbl.clear()
    objFile = open(strFileName, 'r')
    for row in objFile:
        lstRow = row.strip().split(',')
        dicRow = {'id': lstRow[0], 'title': lstRow[1], 'artist':lstRow[2]}
        lstTbl.append(dicRow)
        #print(dicRow)
    objFile.close()
    print('ID, CD Title, Artist')
    for row in lstTbl:
            print(str(row['id']) + ',\t' + row['title'] + ',\t' + row['artist'] + '\n')
   print('Not a valid choice! Please choose either a, i, d, s, l or x!')
```

Figure 4 – Write data to CDInventory.txt and read data from CDInventory.txt



Figure 5 – The data is successfully saved into CDInventory.txt

```
a, i, d, s, l or x: s
Saved inventory to a file!
[a] Add CD
[i] Display Current Inventory
[d] Delete CD from Inventory
[s] Save Inventory to file
[1] Load Inventory from file
[x] Exit
a, i, d, s, l or x: l
ID, CD Title, Artist
   The big wheel, Runrig
           Michael Jackson
    Bad,
3, Jazz Summer Hits 2022, Jazz artists
[a] Add CD
[i] Display Current Inventory
[d] Delete CD from Inventory
[s] Save Inventory to file
   Load Inventory from file
```

Summary

This is just one way of modifying and upgrading the CD inventory file. I found it very interesting and helpful using dictionaries, because they allow us to associate a value to a unique key, and then quickly access this value. I am glad that I was able to successfully modify the code while using dictionaries.

Appendix

CDInventory.py using dictionaries

```
1 #-----#
2 # Title: CDInventory.py
3 # Desc: Starter Script for Assignment 05
4 # Change Log: (Who, When, What)
5 # DBiesinger, 2030-Jan-01, Created File
6 # LSmileski, 2022-Nov-12, Edited File
7 #-----#
8
9 # Declare variabls
10
11 strChoice = " # User input
12 |stTbl = [] # list of lists to hold data
13 # TODO replace list of lists with list of dicts
14 lisRow = {} # dictionary of data row
15 dicRow = {} # dictionary of data row
16 strFileName = 'CDInventory.txt' # data storage file
17 objFile = None # file object
18
19 # Get user Input
20 print('\nThe Magic CD Inventory\n')
21 while True:
22
23 # Display menu allowing the user to choose:
     print('[a] Add CD\n[i] Display Current Inventory\n[d] Delete CD from Inventory')
24
25
     print('[s] Save Inventory to file\n[l] Load Inventory from file\n[x] Exit')
```

```
26
      strChoice = input('a, i, d, s, I or x: ').lower() # convert choice to lower case at time of input
27
      print()
28
29 # 6. Exit the program if the user chooses so
      if strChoice == 'x':
31
         break
32
33 # 1. Add data to the table (2d-list) each time the user wants to add data
     if strChoice == 'a': # no elif necessary, as this code is only reached if strChoice is not 'exit'
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
         IstTbl.append(dicRow)
40
41 #2. Display the current data to the user each time the user wants to display the data
      elif strChoice == 'i':
42
43
         print('ID, CD Title, Artist')
44
        for row in lstTbl:
45
              print(str(row['id']) + ',\t' + row['title'] + ',\t' + row['artist'] + '\n')
46
         print('\n Displayed current Invetory! \n')
47
48 # 3. Delete CD from Inventory
      elif strChoice == 'd':
49
         # TODO Add functionality of deleting an entry
50
51
         deleteld = int(input('Enter id that would love to delete'))
52
         # using del + loop, deleting dictionary in list
53
        for row in range(len(lstTbl)):
54
           if lstTbl[row]['id'] == deleteld:
55
              del lstTbl[row]
56
              break
57
         print('\n The dictionary is successfully deleted! \n')
58
59 # 4. Save the data to a text file CDInventory.txt if the user chooses so
    elif strChoice == 's':
60
61
         objFile = open(strFileName, 'w')
62
        for row in lstTbl:
63
           objFile.write(str(row['id']) + ',' + row['title'] + ',' + row['artist'] + '\n')
64
         objFile.close()
65
         print('\n Saved inventory to a file! \n')
66
67 # 5. Load inventory from a file (read from a file)
68
     elif strChoice == 'I':
69
      # TODO Add the functionality of loading existing data
70
        lstTbl.clear()
71
         objFile = open(strFileName, 'r')
72
        for row in objFile:
73
           lstRow = row.strip().split(',')
74
           dicRow = {'id': lstRow[0], 'title': lstRow[1], 'artist':lstRow[2]}
75
           lstTbl.append(dicRow)
76
           #print(dicRow)
77
         objFile.close()
         print('ID, CD Title, Artist')
78
79
         for row in lstTbl:
80
              print(str(row['id']) + ',\t' + row['title'] + ',\t' + row['artist'] + '\n')
81
82
      else:
83
         print('Not a valid choice! Please choose either a, i, d, s, I or x!')
```