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Foundations of Programming: Python
Assignment 05

CD Inventory Program Python Script (Modified)

Introduction

With Module 5, I learned what is a dictionary, the difference between a dictionary and a list, and the difference between a key/value and an index. Also, I learned how to create a dictionary, use a key to retrieve a value from a dictionary, and read data from a file into a list as well as into a dictionary. Moreover, some of the other things I have learned from this module are four techniques: separation of concerns (SoC), functions, script templates, and structured error handling and applying these techniques to enhance the efficiency and effectiveness of coding.
This document provides the steps I took to modify the last week's CD Inventory program by using the starter script of last week's assignment (provided by the instructor). The program has a menu structure and allows the user to add CD data, load inventory from a file, view the current inventory, store data to a text file, delete an entry, and exit the program. The following are the modifications that are made:

- Changed the script to use dictionaries as the inner data type (list of dictionaries as 2D table)
- Added the functionality to load existing data and delete an entry
- Created/modified some variables and added some functionalities as the program required

Modifying the CD Inventory Python Script

To modify the CD Inventory Python script as required to use dictionaries as the inner data type (list of dictionaries), I used the starter script of last week's assignment that was provided by the instructor. First, I saved the script and used the Spyder as IDE. Second, I created a header that includes a few comments (Line 1-7) that list the title of the program, describes what the program is about, and stores the history of change logs with the name of programmer, date modified, and a brief description of changes (Figure 1).

```
1  #------------------------------------------#
2  # Title: CDInventory.py
3  # Desc: Use dictionaries as the inner data type (list of dictionaries)
4  #       Allows the user to load inventory from file, add CD data, view the current inventory
5  #       delete CD from inventory, save data to a text file, and exit the program.
6  # Change Log: (Who, When, What)
7  # Daisy Pandey, August 9, 2020, Assignment 5: CD Inventory Script
```

Figure 1. Header with Comments

Lastly, I made a few modifications to each block of code. I created and changed some variables as well as added the functionality of loading the current data and deleting an entry from the inventory. The following are the modifications:

- Declared some variables: Created a new variable, "dicRow", that holds dictionaries of CD data, followed by the braces {} operator (Figure 2).

```
11  # Declare variables
12  dicRow = {} # dic of data row
13  lstTbl = []  # list of dictionaries to hold data
14  strChoice = '' # User input
15  strFileName = 'CDInventory.txt'  # data storage file
16  objFile = None  # file object
```

Figure 2. Creating Variables

- Used a while loop to create the program for multiple inputs. The loop repeats a statement or group of statements while the condition is TRUE. Also, the program includes an if statement with the use of the elif clause.
- Added the functionality of loading existing CD data as shown in Figure 3. This allows to load current CD data from the file into memory. With the split() function, it returns the list of strings read in from the text file, separating the strings with a comma, and using the strip() function removes both the leading and trailing whitespace characters. https://docs.python.org/2/library/string.html [1](external site)

```
32    if strChoice == 'L':
33        # Load existing data
34        lstTbl.clear()
35        objFile = open(strFileName, 'r')
36        for row in objFile:
37            lstRow = row.strip().split(',')
38            dicRow = {'id': int(lstRow[0]), 'title': lstRow[1], 'artist': lstRow[2]}
39            lstTbl.append(dicRow)
40            print(row)
41        print('Above are the items loaded from the file into the memory.')
42        objFile.close()
```

Figure 3. Loading Data from File into Memory

- Modified variables for user input that are added into a dictionary (dicRow). Then, used the .append method to append a dictionary into a list (lstTbl) to create a list of dictionaries 2D table, shown in Figure 4.

```
44    elif strChoice == 'a':
45        # Add data to the table (list of dictionaries) each time the user wants to add data
46        cdId = int(input('Enter an ID: '))
47        cdTitle = input('Enter the CD\'s Title: ')
48        cdArtistName = input('Enter the Artist\'s Name: ')
49        dicRow = {'id':cdId, 'title': cdTitle, 'artist': cdArtistName}
50        lstTbl.append(dicRow)
```

Figure 4. Appending a Dictionary into a List

- Used for loop to extract each element and the print function if the user wants to display the current data each time. The * operator unpacks the list and rows.values() returns only the dictionary's values (Figure 5).

```
52     elif strChoice == 'i':
53         # Display the current data to the user each time the user wants to display the data
54         print('ID, CD Title, Artist')
55         for row in lstTbl:
56             print(*row.values(), sep = ', ')
```

Figure 5. Displaying Current Data

- Added the functionality of deleting an entry, shown in Figure 6. This allows to delete CD data from the inventory. Created a "delEntry" variable that asks user input and with del, it deletes the specific dictionary from the list of dictionaries that the user wanted to delete from the current inventory.

```
58    elif strChoice == 'd':
59        # Delete an entry from inventory
60        delEntry = int(input('What entry do you want to delete? '))
61        for entry in range(len(lstTbl)):
62            if lstTbl[entry]['id'] == delEntry:
63                del lstTbl[entry]
64                print()
65                print('Your entry is deleted from inventory.')
66                break
```

Figure 6. Deleting an Entry from Inventory

[1] Retrieved August 11, 2020

- Used the open() built-in function to access a file, and ‘a’ to open the file for writing and insert data at the end. Then, I formatted the data in the dictionary and used the write() method to write the strings to an open file, and the close() method to close the opened file as shown in Figure 7.

```
68      elif strChoice == 's':
69          # Save the data to a text file CDInventory.txt if the user chooses so
70          objFile = open(strFileName, 'a')
71          for row in lstTbl:
72              strRow = ''
73              for item in row.values():
74                  strRow += str(item) + ','
75              strRow = strRow[:-1] + '\n'
76              objFile.write(strRow)
77          print('Your data has been saved to the file.')
```

Figure 7. Writing Data to Text File

Running Python Script in Spyder

First, I executed the script in Spyder to ensure all the options in the script were functioning (Figure 8). In addition, I located the CDInventory.txt file, opened it in a text editor, and verified the program was saving the data to the file correctly (Figure 9).

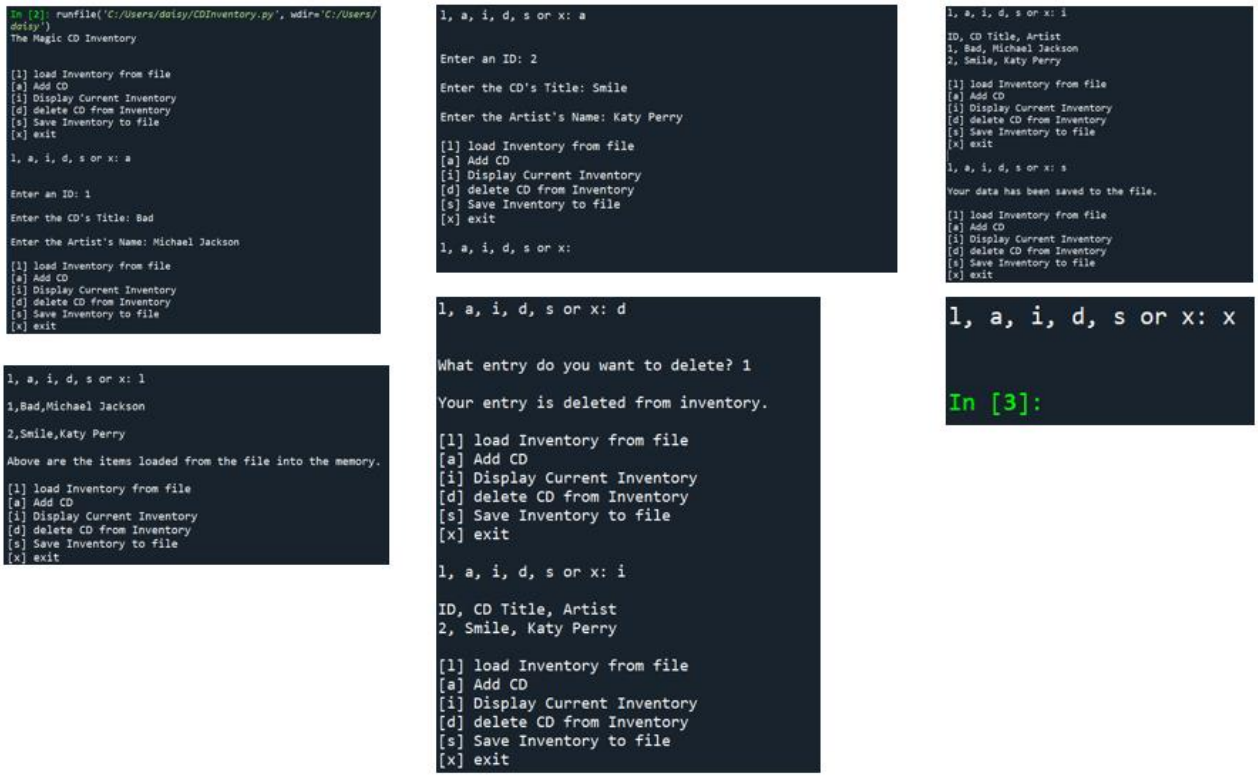

Figure 8. Running Script in Spyder with All Options

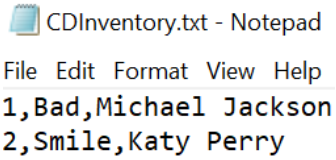

Figure 9. Data Written in a CDInventory.txt File

Running Python Script in Prompt

I reran the script in Anaconda Prompt (Figure 10) and opened the text editor to ensure the data I had entered in prompt has been written to the file correctly, highlighted in Figure 11.

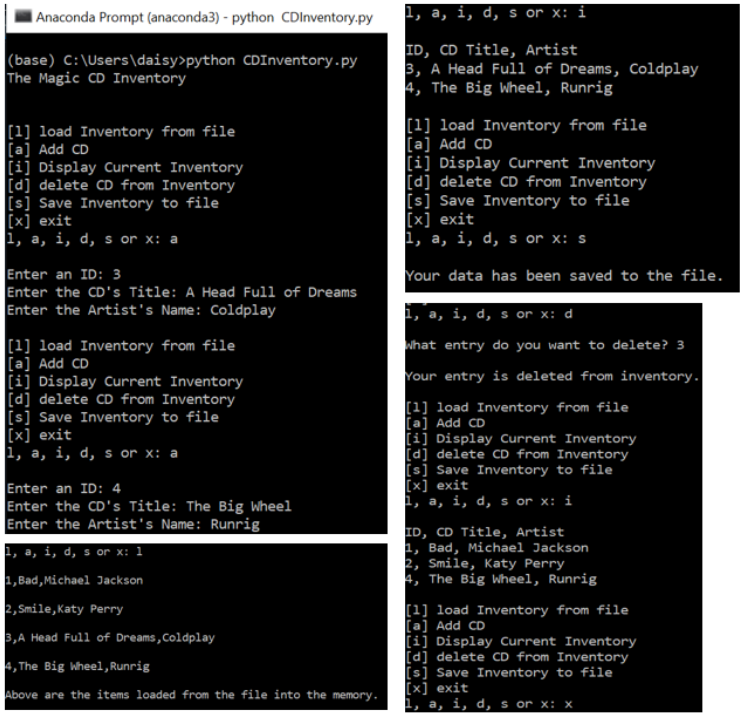

Figure 10. Running Script in Anaconda Prompt

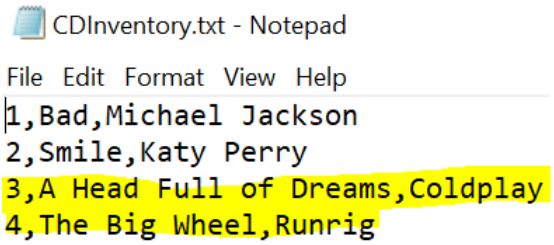

Figure 11. Data Written in a CDInventory.txt File

Creating a GitHub Account

With this module, I have also learned what is GitHub and created an account. I have created a repository, “Assignment_05”, where I have uploaded my knowledge document and CD Inventory Python script. The link to my GitHub repository is https://github.com/daisypandey/Assignment_05.

Summary

With Module 5, I learned what is a dictionary, the difference between a dictionary and list, file read/write access, and four techniques to enhance scripts. After reviewing the Python Programming for the Absolute Beginner Textbook (Chapter 5), FDN_Py_Module_05 pdf document, videos, and few websites, I was able to successfully modify the CD Inventory Program Python Script to use dictionaries as the inner data type (list of dictionaries). This assignment demonstrates my knowledge on creating a list of dictionaries 2D table, reading data from a file, writing data to a file, and deleting the item from the dictionary.

Appendix

The following is the modified and final CD Inventory Program Python Script in the Planet B website. http://www.planetb.ca/syntax-highlight-word [2] (external site)
Also, in the header, I have documented the updates (Line 8).

```
1.  #------------------------------------------#
2.  # Title: CDInventory.py
3.  # Desc: Use dictionaries as the inner data type (list of dictionaries)
4.  #       Allows the user to load inventory from file, add CD data, view the current inventory,
5.  #       delete CD from inventory, save data to a text file, and exit the program.
6.  # Change Log: (Who, When, What)
7.  # Daisy Pandey, August 9, 2020, Assignment 5: CD Inventory Script
8.  # Daisy Pandey, August 11, 2020, updated code as suggested from code review
9.  #------------------------------------------#
10.
11. # Declare variables
12. dicRow = {} # dic of data row
13. lstTbl = []  # list of dictionaries to hold data
14. strChoice = '' # User input
15. strFileName = 'CDInventory.txt'  # data storage file
16. objFile = None  # file object
17.
18. # Get user Input
19. print('The Magic CD Inventory\n')
20. while True:
21.     # Display menu allowing the user to choose:
22.     print()
23.     print('[l] load Inventory from file\n[a] Add CD\n[i] Display Current Inventory')
24.     print('[d] delete CD from Inventory\n[s] Save Inventory to file\n[x] exit')
25.     strChoice = input('l, a, i, d, s or x: ').lower()  # convert choice to lower case at time of inpu
    t
26.     print()
27.
28.     if strChoice == 'x':
29.         # Exit the program if the user chooses to
30.         break
31.
32.     if strChoice == 'l':
33.         # Load existing data
34.         lstTbl.clear()
35.         objFile = open(strFileName, 'r')
36.         for row in objFile:
37.             lstRow = row.strip().split(',')
38.             dicRow = {'id': int(lstRow[0]), 'title': lstRow[1], 'artist': lstRow[2]}
39.             lstTbl.append(dicRow)
40.             print(row)
41.         print('Above are the items loaded from the file into the memory.')
42.         objFile.close()
43.
44.     elif strChoice == 'a':
45.         # Add data to the table (list of dictionaries) each time the user wants to add data
46.         cdId = int(input('Enter an ID: '))
47.         cdTitle = input('Enter the CD\'s Title: ')
48.         cdArtistName = input('Enter the Artist\'s Name: ')
49.         dicRow = {'id':cdId, 'title': cdTitle, 'artist': cdArtistName}
50.         lstTbl.append(dicRow)
51.
52.     elif strChoice == 'i':
53.         # Display the current data to the user each time the user wants to display the data
54.         print('ID, CD Title, Artist')
55.         for row in lstTbl:
56.             print(*row.values(), sep = ', ')
57.
```

[2] Retrieved August 11, 2020

```
    elif strChoice == 'd':
        # Delete an entry from inventory
        delEntry = int(input('What entry do you want to delete? '))
        for entry in range(len(lstTbl)):
            if lstTbl[entry]['id'] == delEntry:
                del lstTbl[entry]
                print()
                print('Your entry is deleted from inventory.')
                break

    elif strChoice == 's':
        # Save the data to a text file CDInventory.txt if the user chooses so
        objFile = open(strFileName, 'a')
        for row in lstTbl:
            strRow = ''
            for item in row.values():
                strRow += str(item) + ','
            strRow = strRow[:-1] + '\n'
            objFile.write(strRow)
        print('Your data has been saved to the file.')
        objFile.close()
    else:
        print('Please choose either l, a, i, d, s or x!')
```