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11/14/2021
Foundations of Programming: Python

Assignment 05

Introduction

The goal of this assignment was to:

- Modify existing code to use 2D lists of dictionaries
- Add functionality to load existing data
- Add functionality to delete data

The following document will describe the steps taken to develop code to meet these requirements.

Code Modification

To begin the process of converting 2D lists of lists into 2D lists of dictionaries, any list variables intended for use as data rows were replaced with dictionaries in the Declare Variables section of code.

The next step was to modify the "Add Data" block of code to use dictionaries instead of lists. The original functionality was to assign user inputs to variables, assign those variables to a list variable, and then append the 2D list with the new data. Using a dictionary instead, the user input was directly assigned to the corresponding value based on the dictionary key. Then the dictionary was appended to the 2D list.

The "Display Data" block of code was modified next. The original functionality was to display a title string, then use a For loop to print each row with a comma and space as a separator. To implement dictionaries, the code was changed to create a string variable built out of the independent values of the dictionary and the desired separators, then printing the string variable.

Finally, the "Save Data" block was modified to accept dictionaries. The original functionality used a For loop to store each item of each row into a string variable with a comma separator, add a newline onto the end of each row, then write the string variable containing the row's data into a file. The dictionary version of the code builds a string out of each value in the dictionary with a comma separator and then writes that string to the data file.

In the process of updating the "Save Data" block of code, If statements were used to add the functionality of allowing the user to choose whether to overwrite their data file or to append their data onto it.

Load Existing Data

Functionality was added to the script to read a file, process the information into a dictionary, and then add this dictionary to the list of dictionaries. The first step of this process was to use a For loop that created a list of the values in each row of the data file, removed the comma and newline separators. Then, the values were assigned to a dictionary based on their corresponding keys. The resulting dictionary was then appended to the list of dictionaries and re-initialized to be empty.

Delete Data

A portion of code was added to the script to allow the user to entries in the list of dictionaries. The input requested of the user was the ID of the entry to be deleted, which was assigned to a string variable. A For loop was used to index through the rows of the 2D list, determine whether the ID was contained in the corresponding value of that dictionary, and then delete the dictionary if so. A 'break' statement was used to stop this For loop as soon as the desired row was deleted.

Adding the "Delete Data" block of code was the most challenging part of this assignment. Google was consulted for a solution to this one.

Conclusion

The code as presented was able to achieve the assignment requirements. This required the implementation of the following lessons from Module 05:

- Lists
- Saving list data in a File
- Loading Data from File into List
- Dictionaries

Due to time constraints this week, this assignment only meets the minimum requirements of the assignment and did not get the same TLC that these assignments usually do. Consequentially, there is a laundry list of opportunities for improvement:

- Better formatting of data outputs
- Automated sorting of the table by ID
- More options for deleting (not just by ID)
- Invalidating duplicate ID entries (this would be an awful database)
- A more elegant way of printing dictionaries as strings (probably using dictionary functions)
- Better formatting of code using Separation of Concern

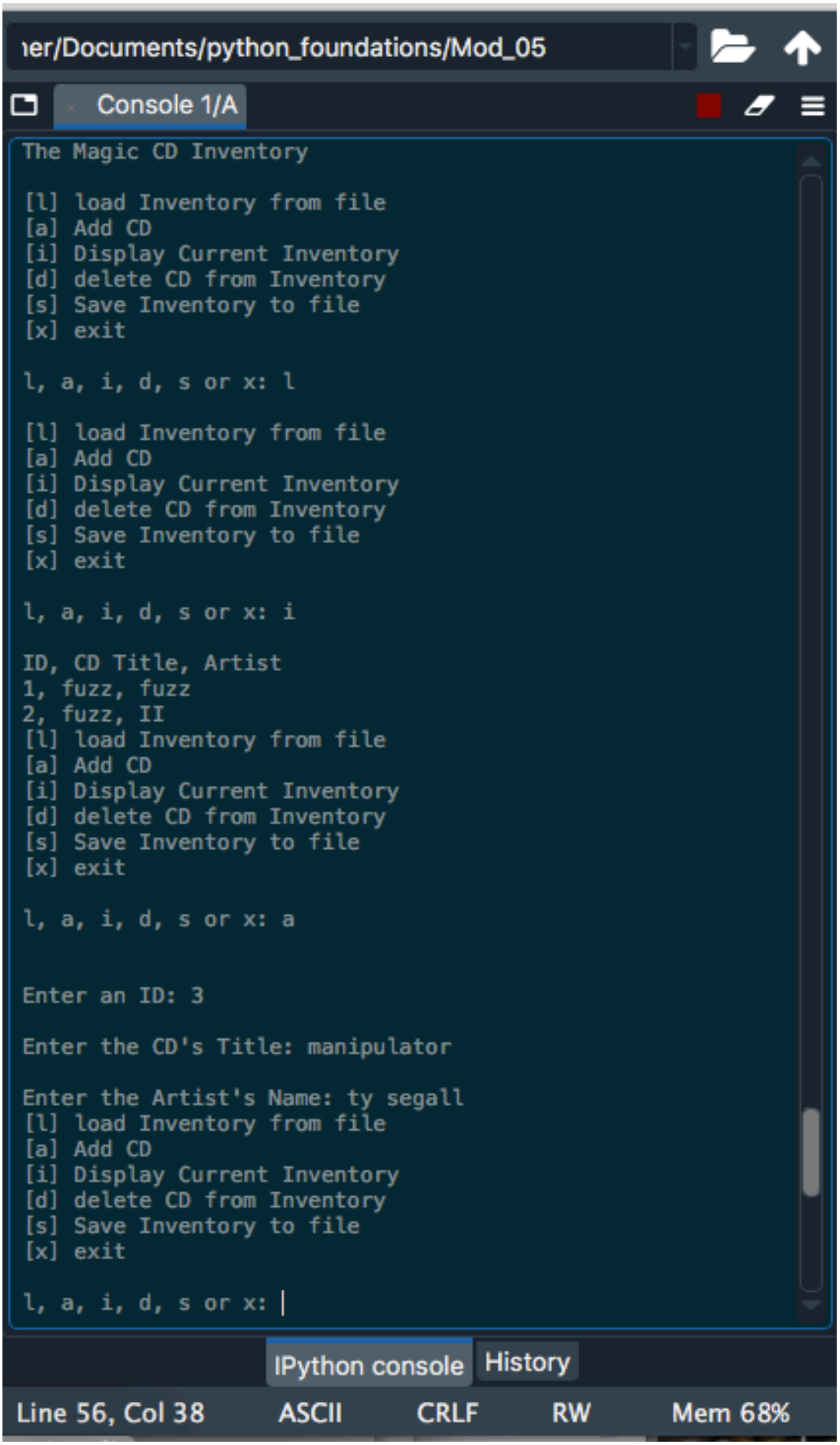
Appendix

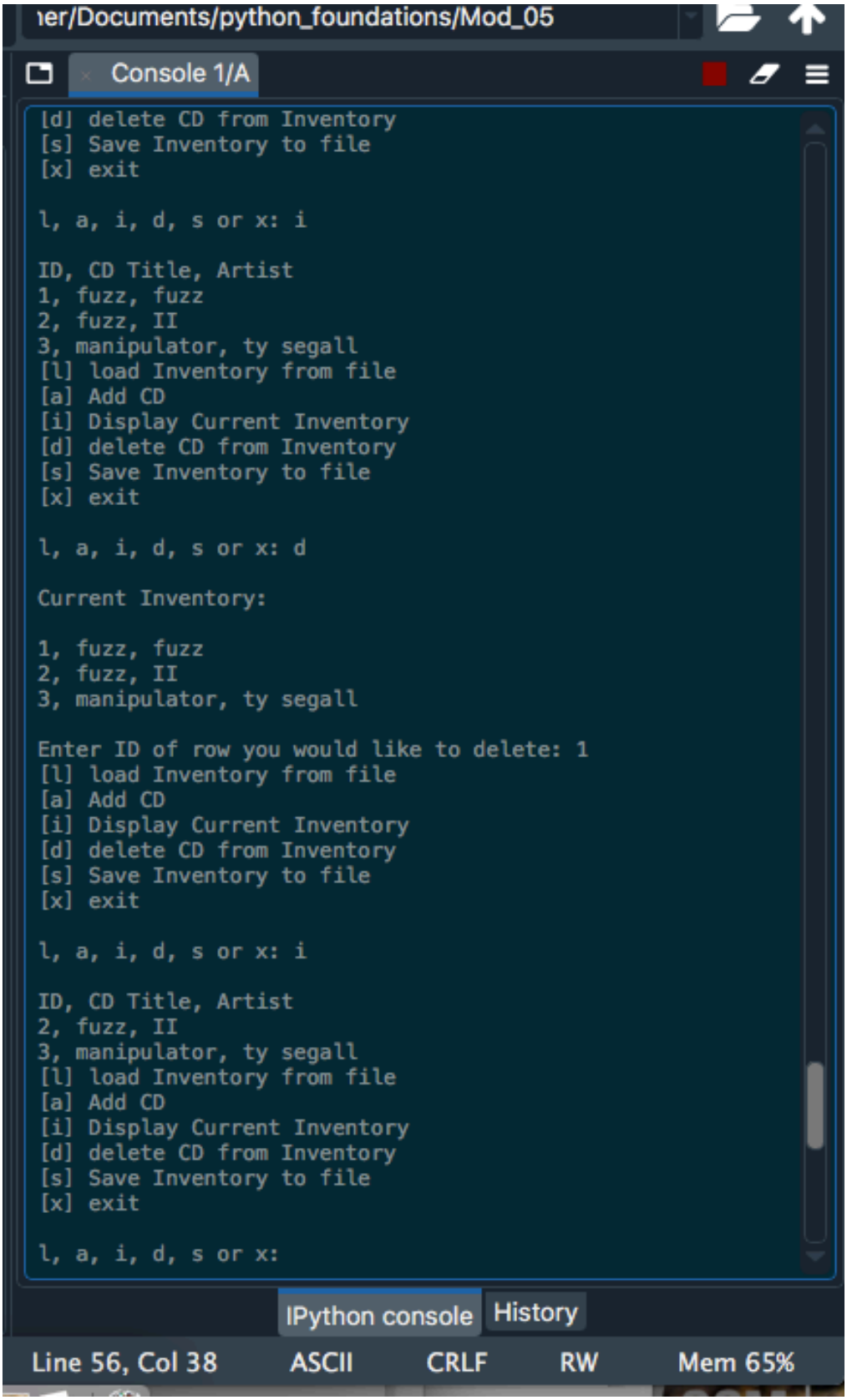
Source Code

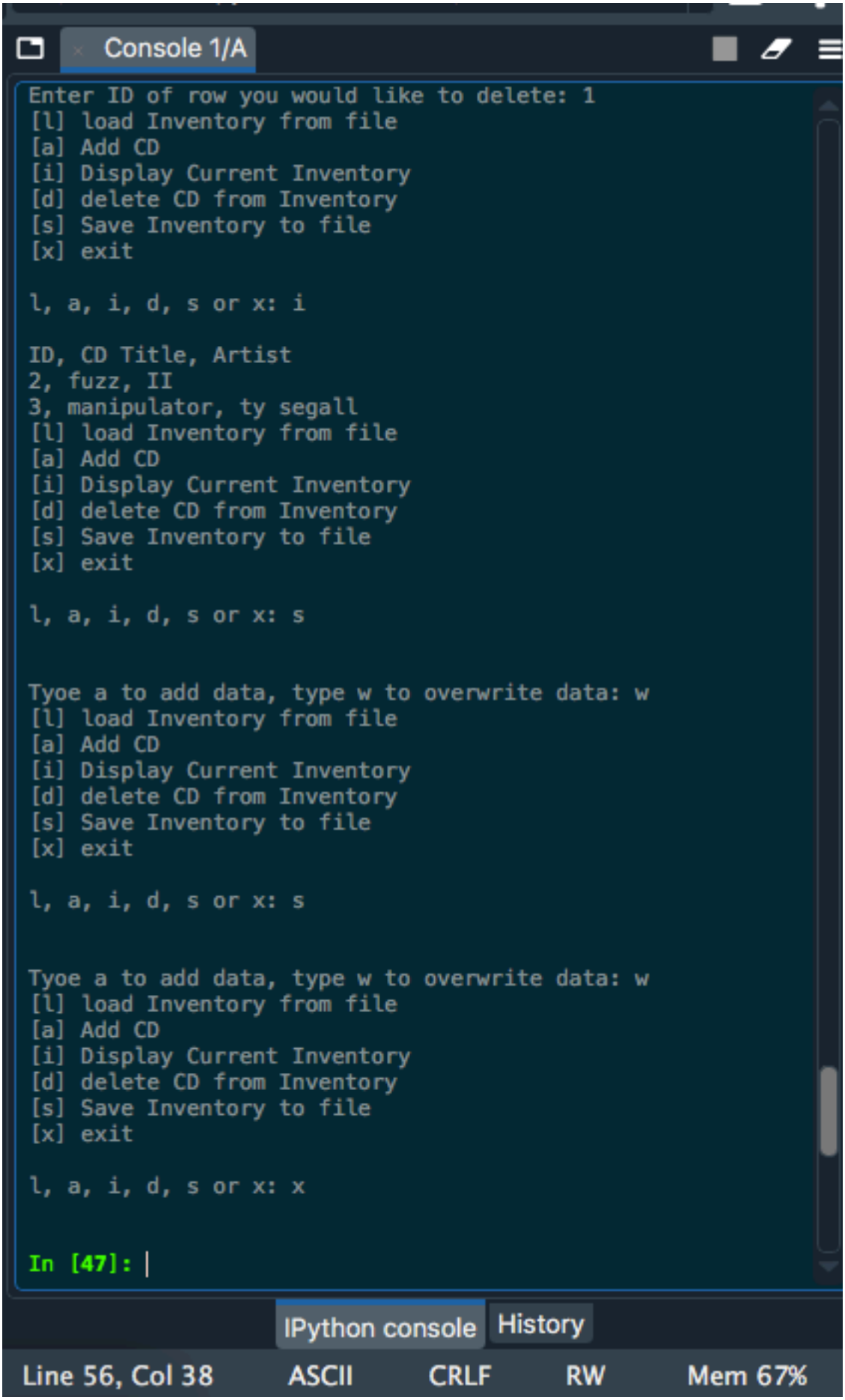
```
#------------------------------------------#
# Title: Assignment05.py
# Desc: Assignment 05 for Foundations of Programming: Python
# Change Log: (Who, When, What)
# DBiesinger, 2030-Jan-01, Created File
# SBurner, 2021-Nov-11, changed lists to dictionaries
#------------------------------------------#


# Declare variables

strChoice = '' # User input
lstTbl = []  # list of lists to hold data
dicRow = {}  # dictionary for table row
strFileName = 'CDInventory.txt'  # data storage file
objFile = None  # file object
readRow = []
readDic = {}
strID = ''
strTitle = ''
strArtist = ''
strRow = ''

# Get user Input
print('The Magic CD Inventory\n')
while True:
    # 1. Display menu allowing the user to choose:
    print('[l] load Inventory from file\n[a] Add CD\n[i] Display Current Inventor
    print('[d] delete CD from Inventory\n[s] Save Inventory to file\n[x] exit')
    strChoice = input('l, a, i, d, s or x: ').lower()  # convert choice to lower
    print()

    if strChoice == 'x':
        # 5. Exit the program if the user chooses so
        break
    if strChoice == 'l':
        objFile = open(strFileName,'r')
        for row in objFile:
            readRow = row.strip().split(',')
            readDic['ID'] = readRow[0]
            readDic['Artist'] = readRow[1]
            readDic['Title'] = readRow[2]
            lstTbl.append(readDic)
            readDic = {}
        objFile.close()
        pass
    elif strChoice == 'a':  # no elif necessary, as this code is only reached if
        # 2. Add data to the table (2d-list) each time the user wants to add data
        dicRow['ID'] = input('Enter an ID: ')
        dicRow['Title'] = input('Enter the CD\'s Title: ')
```

```
        dicRow['Artist'] = input('Enter the Artist\'s Name: ')
        lstTbl.append(dicRow)
    elif strChoice == 'i':
        # 3. Display the current data to the user each time the user wants to dis
        print('ID, CD Title, Artist')
        for row in lstTbl:
            strRow = str(row['ID']) + ', ' + str(row['Title']) + ', ' + str(row[
            print(strRow)
    elif strChoice == 'd':
        # Allow the user to delete a row
        print('Current Inventory:\n')
        for row in lstTbl:
            strRow = str(row['ID']) + ', ' + str(row['Title']) + ', ' + str(row[
            print(strRow)

        delID = str(input('Enter ID of row you would like to delete: '))

        for i in range(len(lstTbl)):
            if lstTbl[i]['ID'] == delID:
                del lstTbl[i]
                break
        pass
    elif strChoice == 's':
        # 4. Save the data to a text file CDInventory.txt if the user chooses so
        wrtType = input('Tyoe a to add data, type w to overwrite data: ').lower()
        if wrtType == 'a':
            objFile = open(strFileName,'a')
            for row in lstTbl:
                strRow = str(row['ID']) + ',' + str(row['Title']) + ',' + str(rov
                objFile.write(strRow)
            objFile.close()
        elif wrtType == 'w':
            objFile = open(strFileName,'w')
            for row in lstTbl:
                strRow = str(row['ID']) + ',' + str(row['Title']) + ',' + str(rov
                objFile.write(strRow)
            objFile.close()
        else:
            print('invalid option')

    else:
        print('Please choose either l, a, i, d, s or x!')
```

Code Screenshots (Spyder)




ıer/Documents/python_foundations/Mod_05
Console 1/A
[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, fuzz, fuzz
2, fuzz, II
3, manipulator, ty segall
[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: d
Current Inventory:
1, fuzz, fuzz
2, fuzz, II
3, manipulator, ty segall
Enter ID of row you would like to delete: 1
[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
2, fuzz, II
3, manipulator, ty segall
[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:
IPython console
History
Line 56, Col 38
ASCII
CRLF
RW
Mem 65%


Console 1/A
Enter ID of row you would like to delete: 1
[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
2, fuzz, II
3, manipulator, ty segall
[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
Tyoe a to add data, type w to overwrite data: w
[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
Tyoe a to add data, type w to overwrite data: w
[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
In [47]:
IPython console
History
Line 56, Col 38
ASCII
CRLF
RW
Mem 67%

Code Screenshots (Terminal)

```
[s] Save Inventory to file
[x] exit
l, a, i, d, s or x: x

(base) Sams-MacBook-Pro-2:MOD_05 Burner$ python Assignment05.py
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: l

[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
2, II, fuzz
3, ty segall, manipulator
[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: fuzz
Enter the Artist's Name: fuzz
[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
2, II, fuzz
3, ty segall, manipulator
1, fuzz, fuzz
[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:
```

```
ID, CD Title, Artist
2, II, fuzz
3, ty segall, manipulator
1, fuzz, fuzz
[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: d

Current Inventory:

2, II, fuzz
3, ty segall, manipulator
1, fuzz, fuzz
Enter ID of row you would like to delete: 1
[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
2, II, fuzz
3, ty segall, manipulator
[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

Tyoe a to add data, type w to overwrite data: a
[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

Tyoe a to add data, type w to overwrite data: w
[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

(base) Sams-MacBook-Pro-2:MOD_05 Burner$
```