

Shuhua Liang

2022-11-15

IT FDN 110 A

Assignment05

<https://github.com/sliang2022/IntroToProg-Python>

Lists and Dictionaries

Introduction

From this lecture, I learned (1) different file read/write features. (2) How to define a dictionary and a list of dictionaries. (3) How to change values in a Dictionary. (4) How to access the values in a Dictionary.

Read txt file using `open()`

Following the blueprint from the homework instructions, the txt file is declared at the beginning of the file. However, I was confused to see that an object is declared in the beginning instead. I tried to follow the instructions but failed to find a way to directly declare the object by assigning the txt file name to it. In the end, I decided to declare the `objFile` in a different way as in Fig 1b.

```
# declare variables and constants
objFile = "ToDoList.txt" # An object that represents a file
```

Figure 1a, directly declare the object that represents a file.

```
# declare variables and constants
strFile = "ToDoList.txt" # text file to read
objFile = "" # An object that represents a file
```

Figure 2b, declare the object and txt file separately.

Read txt file and convert the data in a “list of dictionaries”

Different from previous homework, this time we need to manually create a txt file with Tasks and Priorities for the code to read. When creating the file, I must type enter to start a new row. That causes a problem. Python somehow picks up the signal as “\n”. I decided to use `row.rstrip('\n')` to fix the problem.

```
C:\_PythonClass\Assignment05\env\Scripts\python.exe C:\_PythonClass\Assignment05\Assignment05_Shuhua_
[{'Task': 'Learn to type', 'Priority': ' High\n'}, {'Task': 'Learn to drive', 'Priority': ' High\n'},
```

Figure 2, Manually typed txt file shows “\n” sign.

To read a txt file in to a “list of dictionaries” is more complicated than I thought. I must first read each row and assign the row elements into a dictionary and append the dictionary to the list.

```
objFile = open(strFile, "r")
for row in objFile:
    row = row.rstrip('\n') # remove \n in txt file
```

```

strData = row.split(",") # Returns a list!
dicRow = {"Task":strData[0], "Priority":strData[1]}
lstTable.append(dicRow)

```

Figure 3, Assign txt file data into a list of dictionaries.

Update txt file and Access dictionary items

There are two additional challenges I encountered in the home work are:

(1) how to update the txt file

It will be difficult to edit the txt file without delete/overwrite it. In the previous homework, there is no “delete item” option, so we can simply append a new item to the end of the old txt file. In this homework, there is a “delete task” option. As a result, the whole list need to be write to the txt file and overwrite the old version. I first tried to use `open(strFile, "w")` where “w” overwrite the old version. But since I am writing every dictionary one after another, this will only leave one row of data in the txt file. I also tried to write the whole list to the txt file at once without going through the for loop. But I failed to find out how to do that. In the end, I used a quite dumb way. I first overwrite the old txt file without enter any data. Then, I use `open(strFile, "a")` to append each row one by one to the empty txt file. (2) How to write list of dictionaries into text file.

In the previous homework, I write a list of list (table) into a txt file, which is rather straight forward. I used 0 and 1 to access elements in each row. But this method failed in this homework and caused an error. Now we are dealing with a list of dictionaries. So, I can no longer access elements inside a dictionary with 0 and 1. Instead, I need to use keys and values to access each element.

```

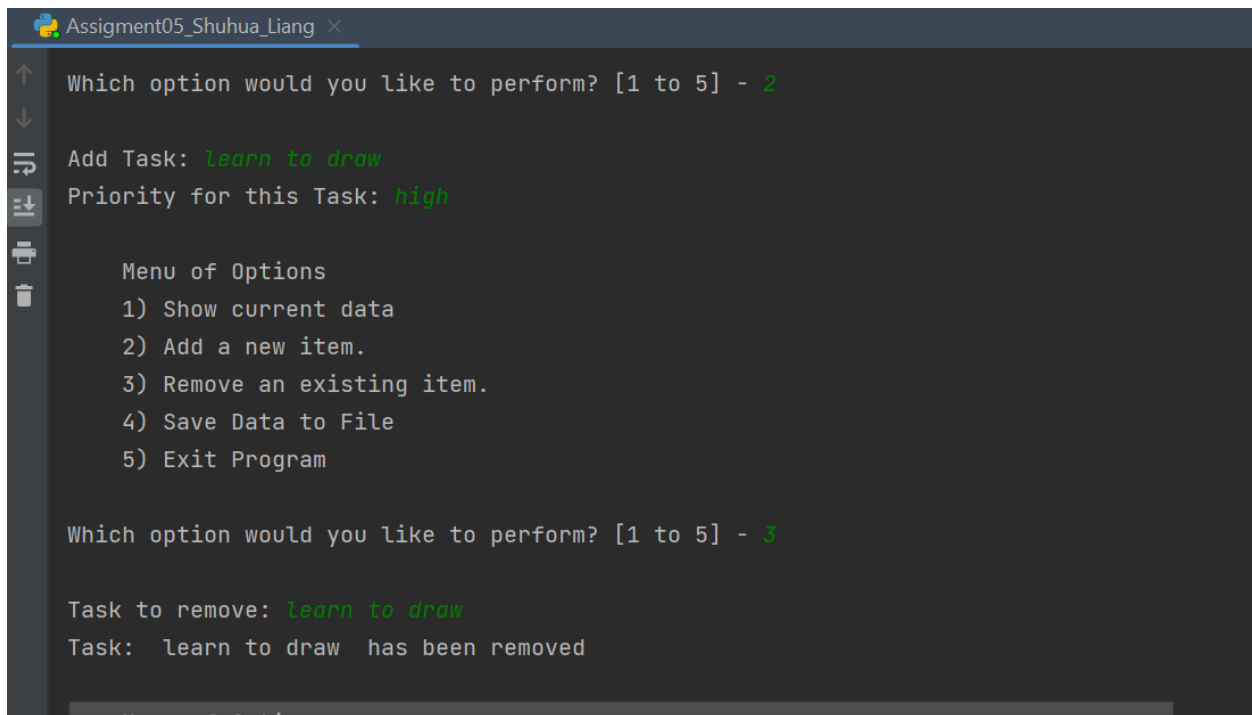
elif strChoice.strip() == '4':
    objFile = open(strFile, "w")
    objFile.close()
    # overwrite the old file and start a new file
    objFile = open(strFile, "a")
    for row in lstTable:
        x = str(row["Task"]) + ',' + str(row["Priority"]) + '\n'
        objFile.write(x)
    objFile.close()

```

Figure 4: Writing a list of dictionaries to a txt file is more complex than writing a list of list (table)

Results

I overcame all obstacles and finished the homework. Some other challenging parts are adding/removing tasks from the list. As you can see in the figure below, the code was able to conduct operations as instructed.

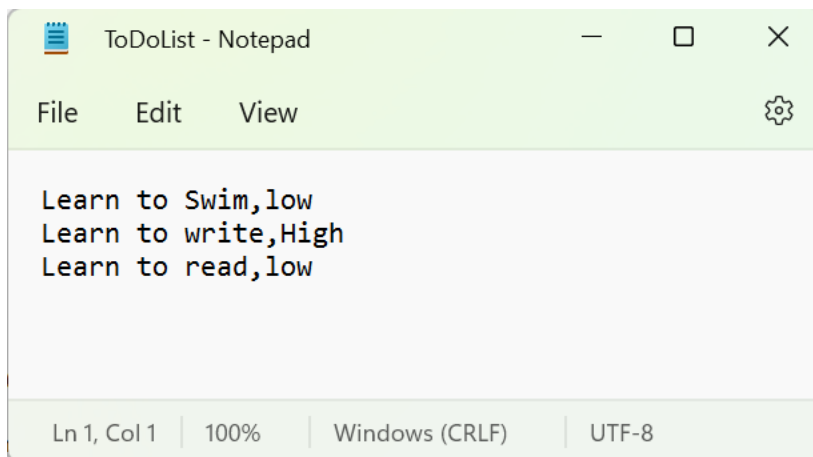
A terminal window titled 'Assigment05_Shuhua_Liang' with a dark background. It shows the execution of a program. The first prompt is 'Which option would you like to perform? [1 to 5] - 2', where '2' is the user input. This leads to 'Add Task: learn to draw' and 'Priority for this Task: high'. Then a 'Menu of Options' is displayed with five choices. The second prompt is 'Which option would you like to perform? [1 to 5] - 3', where '3' is the user input. This leads to 'Task to remove: learn to draw' and finally 'Task: learn to draw has been removed'.

```
Assigment05_Shuhua_Liang x
↑
↓
Which option would you like to perform? [1 to 5] - 2
Add Task: learn to draw
Priority for this Task: high

Menu of Options
1) Show current data
2) Add a new item.
3) Remove an existing item.
4) Save Data to File
5) Exit Program

Which option would you like to perform? [1 to 5] - 3
Task to remove: learn to draw
Task: learn to draw has been removed
```

Figure 5: The code responded to inputs as designed.

A Notepad window titled 'ToDoList - Notepad' with a light green header. The menu bar includes 'File', 'Edit', 'View', and a settings icon. The text area contains three lines of text: 'Learn to Swim,low', 'Learn to write,High', and 'Learn to read,low'. The status bar at the bottom shows 'Ln 1, Col 1', '100%', 'Windows (CRLF)', and 'UTF-8'.

```
ToDoList - Notepad
File Edit View
Learn to Swim,low
Learn to write,High
Learn to read,low
Ln 1, Col 1 | 100% | Windows (CRLF) | UTF-8
```

Figure 6: Final results with tasks added/removed are saved in the ToDoList.txt file

Summary

In this project, I learned how to construct a list of dictionaries, access elements in the dictionaries and edit them. I also learned how to write data into txt files with different modes, such as read only, write only and append only.