Shuhua Liang

2022-11-15

IT FDN 110 A

Assignment05

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\venv\Scripts\python.exe C:\_PythonClass\Assignment05\Assigment05_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.

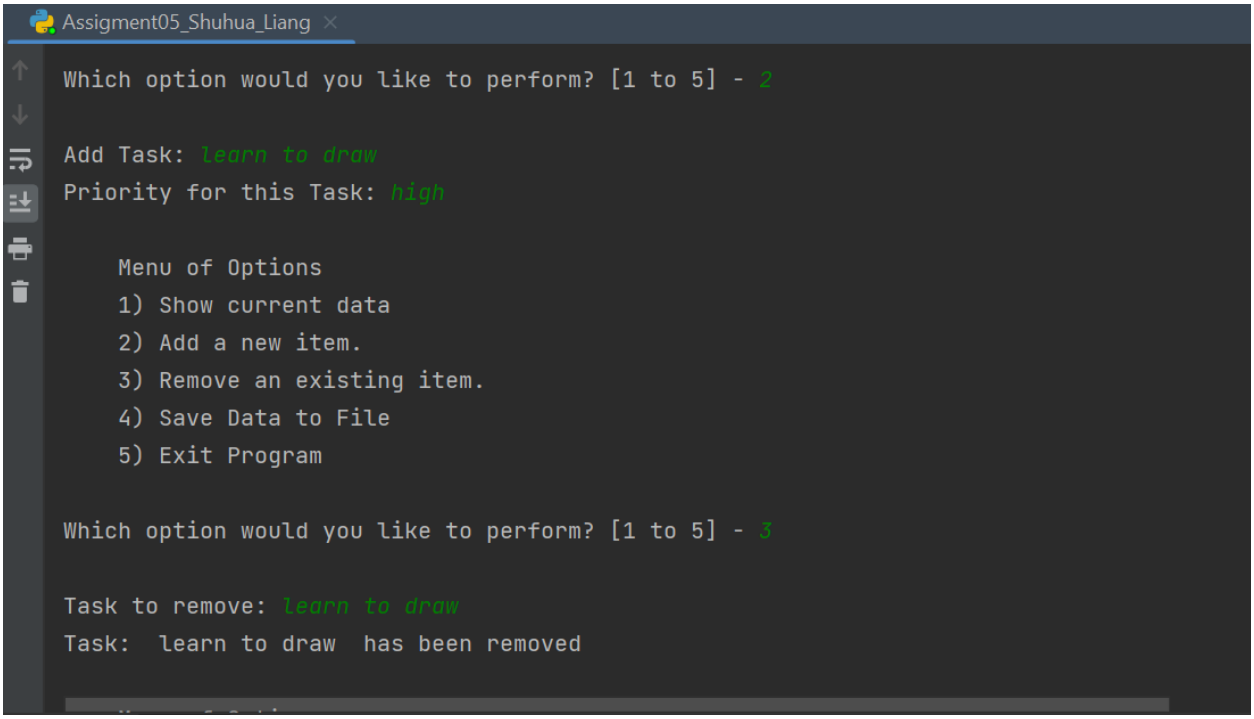

Figure 5: The code responded to inputs as designed.

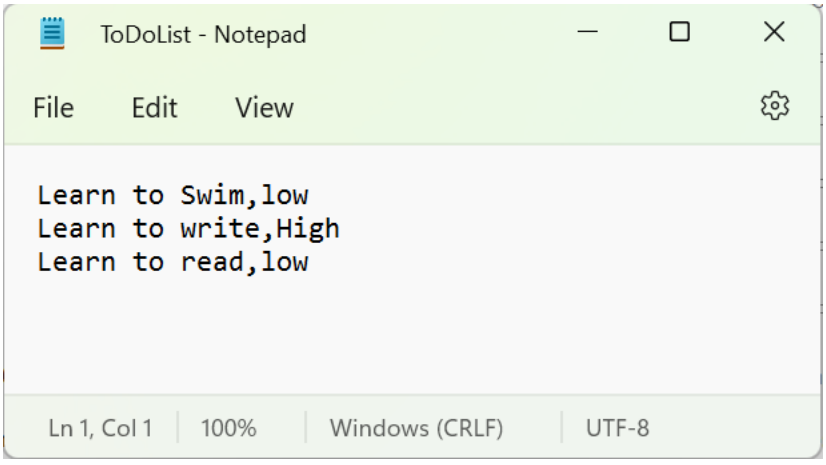

Figure 6: Finial results with tasks added/removed are saved in the ToDoList.txt file

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.