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Foundations of Programming, Python

Assignment 05

GitHub URL: <https://github.com/jkwwray/IntroToProg-Python>

Working with Lists and Dictionaries

Introduction

This assignment asked us to work with a text file that had a list of tasks and their priorities. The purpose of the assignment was to practice working with dictionary items loaded into a list. We were asked to read the items, add to the items, delete an item, and write the list back to the text file. This was definitely a challenging assignment that took me a bit to get into but once I wrapped my head around it I was able to complete the tasks.

Creating the Script

The first part of the script declares all the variables the script will be using and then loads the data from the text file into the list variable. It does this by reading each item in the file, splitting them using a comma, creating a dictionary “row” from the data and adding it to the list “table”. This gives us our data that we will be working with for each of the five options we give the user on the menu. Below is the first part of the script and the original text file of tasks and priorities.

```
# -- Data -- #
# declare variables and constants
strFile = "ToDoList.txt" # file that holds the data
strData = "" # A row of text data from the file
dicRow = {} # A row of data separated into elements of a dictionary {Task,Priority}
lstTable = [] # A list that acts as a 'table' of rows
strMenu = "" # A menu of user options
strChoice = "" # A Capture the user option selection
# objFile = None # An object that represents a file [NOTE: had to comment this out it didn't load the file below]

# -- Processing -- #
# Step 1 - When the program starts, load the any data you have
# in a text file called ToDoList.txt into a python list of dictionaries rows (like Lab 5-2)
objFile = open(strFile, 'r')
for row in objFile:
    lstRow = row.split(',')
    dicRow = {'Task': lstRow[0], 'Priority': lstRow[1]}
    lstTable.append(dicRow)

# -- Input/Output -- #
# Step 2 - Display a menu of choices to the
while (True):
    print("""
    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
    """)
    strChoice = str(input("Which option would you like to perform? [1 to 5] - "))
    print() # adding a new line for looks
```

Figure 1: Assignment05.py (part 1)

```
Call vet, high
Prep dinner, medium
Laundry, low
Walk dogs, high
Workout, medium
```

Figure 2: Starting ToDoList.txt

Once the data is loaded the program displays a menu of options for the user to choose from. If the user chooses to show the data, the script simply prints out each row and then shows the menu. The next option allows the user to add a new task to the list. It takes two inputs, creates a new dictionary item and then appends it to the existing list. The user also has the option to remove an item from the task list. If this option is chosen, the script first prints out the current list so the user knows what is currently on the list. It then asks them what item they would like to remove. The script loops through the rows in the table and if it finds a match, it removes the row. The fourth item in the menu allows the current list that is stored in memory to be written back to the original text file. It simply loops through the “table” list and writes each row back into the file. It then displays a message telling the user the data has been saved. The final option allows the user to exit the program.

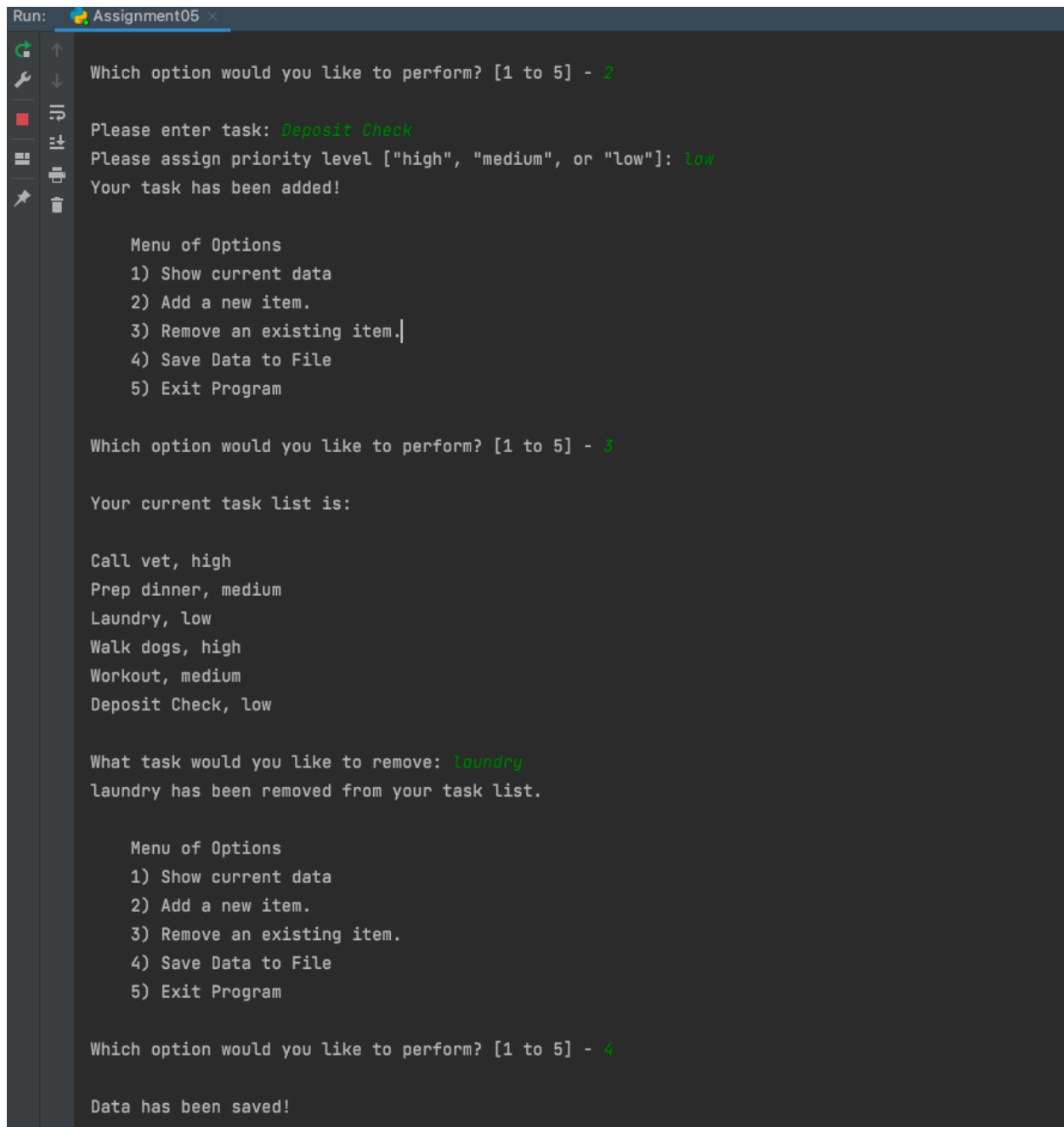
Below shows the details of the script for each option.

```
# Step 3 - Show the current items in the table
if (strChoice.strip() == '1'):
    for row in lstTable:
        print(row['Task'] + ', ' + row['Priority'].strip())
    continue
# Step 4 - Add a new item to the list/Table
elif (strChoice.strip() == '2'):
    strTask = input('Please enter task: ')
    strPriority = input('Please assign priority level ["high", "medium", or "low"]: ')
    dicRow = {'Task': strTask, 'Priority': strPriority + '\n'}
    lstTable.append(dicRow)
    print('Your task has been added!')
    continue
# Step 5 - Remove a new item from the list/Table
elif (strChoice.strip() == '3'):
    # print out current task list so user can choose one to remove
    print('Your current task list is:\n')
    for row in lstTable:
        print(row['Task'] + ', ' + row['Priority'].strip())
    # get item to be removed
    strRemove = input('\nWhat task would you like to remove: ')
    # find task to be removed
    for row in lstTable:
        if strRemove.lower() in row['Task'].lower():
            lstTable.remove(row)
            print(strRemove + ' has been removed from your task list.')
    continue
# Step 6 - Save tasks to the ToDoToDoList.txt file
elif (strChoice.strip() == '4'):
    objFile = open(strFile, 'w')
    for row in lstTable:
        objFile.write(row['Task'] + ', ' + row['Priority'])
    objFile.close()
    print('Data has been saved!\n')
    continue
# Step 7 - Exit program
elif (strChoice.strip() == '5'):
    print('Bye!')
    break # and Exit the program
```

Figure 3: Assignment05.py (part 2)

Running the Script

To run the script in PyCharm I right clicked and chose “Run” from the dropdown menu. I then ran through each menu item in order. When I got to the second menu option I added “Deposit Check” with a priority of “low” to the list. Next, I removed “Laundry” from the list and then I finally wrote the updated list back to the original text file. I verified that those changes were indeed reflected in the file as you can see below when compared to the original file above.



```
Run: Assignment05 x
Which option would you like to perform? [1 to 5] - 2
Please enter task: Deposit Check
Please assign priority level ["high", "medium", or "low"]: low
Your task has been added!

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] - 1

Your current task list is:

Call vet, high
Prep dinner, medium
Laundry, low
Walk dogs, high
Workout, medium
Deposit Check, low

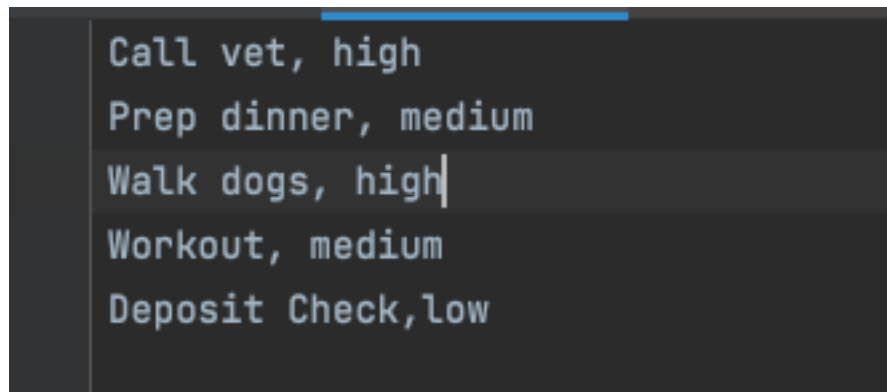
What task would you like to remove: laundry
laundry has been removed from your task list.

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] - 4

Data has been saved!
```

Figure 4: Output in PyCharm

A screenshot of a text editor window with a dark background. A blue horizontal line is at the top. The text is as follows:

```
Call vet, high  
Prep dinner, medium  
Walk dogs, high  
Workout, medium  
Deposit Check, low
```

Figure 5: Updated ToDoList.txt

I then opened a terminal window on my Mac and typed “python3 ../Assignment05.py” to run the program. I performed the same tasks as I did when I ran it in PyCharm and verified that the script worked as expected.

```
assignment05 python3 assignment05.py

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] - 1

Call vet, high
Prep dinner, medium
Laundry, low
Walk dogs, high
Workout, medium

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] - 2

Please enter task: Deposit Check
Please assign priority level ["high", "medium", or "low"]: low
Your task has been added!

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] - 1

Call vet, high
Prep dinner, medium
Laundry, low
Walk dogs, high
Workout, medium
Deposit Check, low

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

Your current task list is:

Call vet, high
Prep dinner, medium
Laundry, low
Walk dogs, high
Workout, medium
Deposit Check, low

What task would you like to remove: laundry
laundry has been removed from your task list.

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] - 1

Call vet, high
Prep dinner, medium
Walk dogs, high
Workout, medium
Deposit Check, low

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

Figure 6: Output in Terminal

Conclusion

This assignment was much more challenging than the previous ones. I often made good use of basic print functionality to view the data in a raw format as a test to check it before writing the processing code in each section. I definitely thought I had a good handle on the concept of a list storing rows of data as dictionaries before starting the assignment, but I did find myself confused at the beginning when trying to load the data into the script. However, after writing the rest of the code I now feel much more confident in my understanding of these concepts. This assignment was very helpful in growing my understanding of lists and dictionaries.