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November 6, 2024

Foundations of Programming: Python

Assignment 04

Collections of Data

Introduction

Assignment 04 was built on the script previously written for assignment 03. However, it added a new technique of using lists and files for data processing. PyCharm IDE was used for the script with basic outline provided as a starter file.

Define Data Constants and Variables

Data constants and variables were all the same from assignment 03 apart from student_data and students. The list was set to empty based on page 12 of note 4 as shown in figure 1.

```
# Define the Data Constants
MENU: str = '''
---- Course Registration Program ----
  Select from the following menu:
    1. Register a Student for a Course.
    2. Show current data.
    3. Save data to a file.
    4. Exit the program.
-----------------------------------------
'''
FILE_NAME: str = "Enrollments.csv"

# Define the Data Variables
student_first_name: str = ''  # Holds the first name of a student entered by the user.
student_last_name: str = ''  # Holds the last name of a student entered by the user.
course_name: str = ''  # Holds the name of a course entered by the user.
csv_data: str = ''  # Holds combined string data separated by a comma.
file_obj = None  # Holds a reference to an opened file.
menu_choice: str  # Hold the choice made by the user.
student_data: list = [] # Row of student data.
students: list = [] # Table for student data.
```

Figure 1. Application of list.

Processing

Enrollement.csv was automatically read into a two-dimensional list table using the example from lecture 4 at 58:00. The “r” made the file be read with the python code while split and strip function allowed the data to be structured as shown in page 27 of note 4. The students were appended to allow multiple registrations.

```
with open(FILE_NAME, "r") as file:
    for line in file:
        line_data = line.strip().split(',')
        students += line_data
```

Figure 2. Read enrollment.csv when script runs.

The rest of the code aligned with assignment 03 apart from menu_choice 1 having the addition of appending multiple student names and how students should be inputted with the defined user inputs. Menu 2 was updated to be able to pull previously entered data to display the multiple registrations. Please see figure 3 for more details on the script.

```
while (True):
    # Present the menu of choices
    print(MENU)
    menu_choice = input("What would you like to do: ")
    # Input user data
    if menu_choice == "1":  # This will not work if it is an integer!
        student_first_name = input("Enter the student's first name: ")
        student_last_name = input("Enter the student's last name: ")
        course_name = input("Please enter the name of the course: ")
        csv_data += f"{student_first_name},{student_last_name},{course_name}\n"
        students = [student_first_name, student_last_name, course_name]
        student_data += [students]
        continue
    # Present the current data
    elif menu_choice == "2":
        print("\nThe current data is:")
        print(csv_data)
        print(f'Data in enrollments: {student_data}')
        continue
    # Save the data to a file
    elif menu_choice == "3":
        file_obj = open(FILE_NAME, "w")
        file_obj.write(csv_data)
        file_obj.close()
        print(f"You have registered {student_first_name} {student_last_name} for {course_name}.")
        continue
    # Stop the loop
    elif menu_choice == "4":
        break  # out of the loop
    else:
        print("Please only choose option 1, 2, or 3")
print("Program Ended")
```

Figure 3. Menu_choices

Testing

The program was tested in PyCharm and CMD with the results shown in figure 4. It met the requirements of multiple registration of the user and having it exported into a csv file. For testing on CMD, assignment 01 was referred. Figure 4 demonstrates the requirement being met on PyCharm while figure 5 demonstrates the script running on CMD.

```
What would you like to do: 2

The current data is:
Ryan,Choi,Python 100
Yumin,Song,Python 100

Data in enrollments: [['Ryan', 'Choi', 'Python 100'], ['Yumin', 'Song', 'Python 100']]

---- Course Registration Program ----
  Select from the following menu:
    1. Register a Student for a Course.
    2. Show current data.
    3. Save data to a file.
    4. Exit the program.
----------------------------------------

What would you like to do: 3
You have registered Yumin Song for Python 100.

---- Course Registration Program ----
  Select from the following menu:
    1. Register a Student for a Course.
    2. Show current data.
    3. Save data to a file.
    4. Exit the program.
----------------------------------------

What would you like to do: 4
Program Ended
```

Figure 4. Demonstrates the requirements being met on PyCharm.

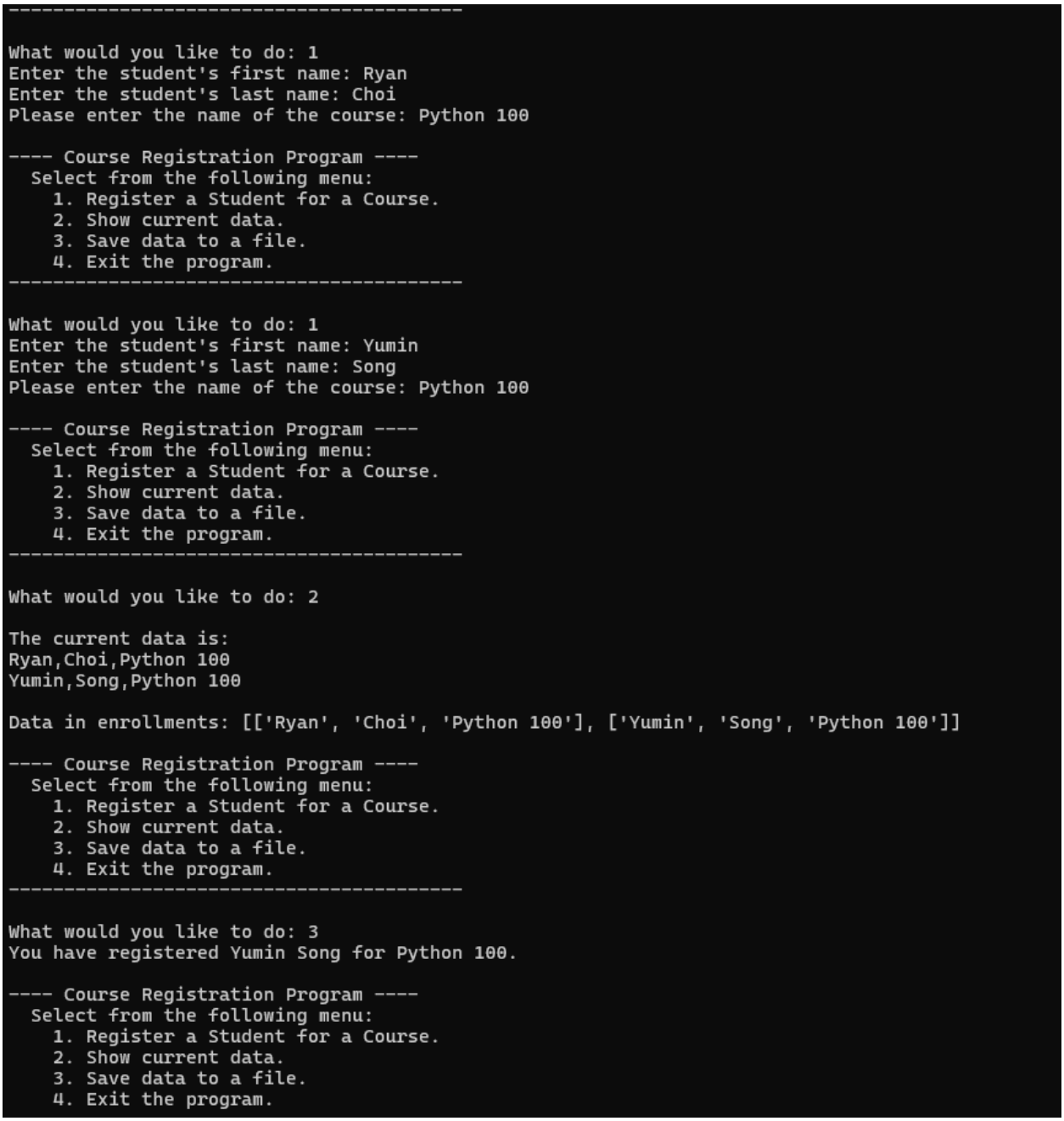

Figure 5. Demonstrates the requirements being met on CMD.

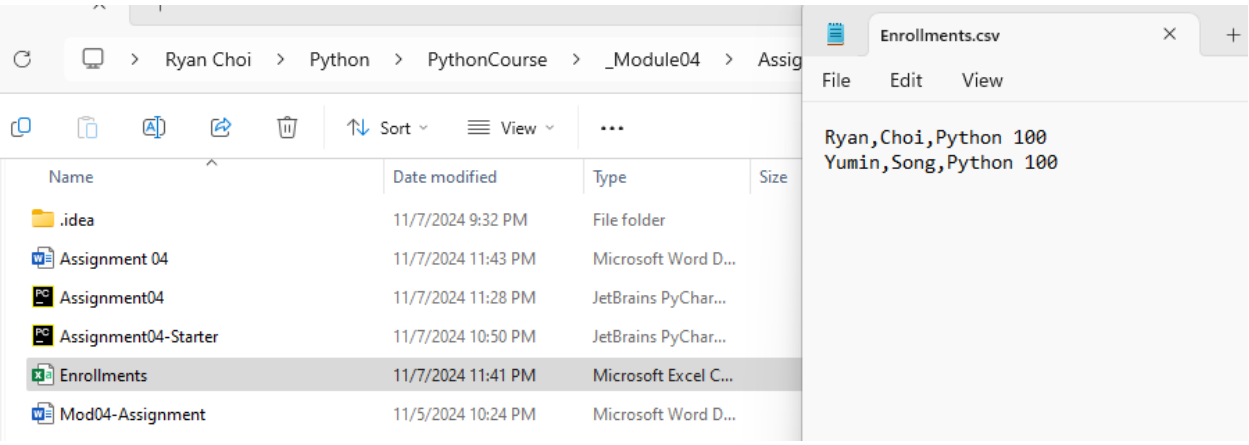

Figure 6. Data recorded in the csv.

Summary

The assignment was like 3 but it included information on how to use techniques for data processing. I found the append to be helpful as it allowed multiple entries to be saved. It was nice to learn the basics as I was used to using pandas functions. Note 04 was helpful and was informative in using the additional techniques to meet the requirements for Assignment 04.