

Rakshit Govil

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Introduction to programming with Python

Assignment 05

GitHub URL: <https://github.com/rakgov21/IntroToProg-Python>

Introduction to Programming with Python

(Advanced Collections and Error Handling)

Introduction

In this assignment I will explain the steps I used to create a python script that provides user with 4 menu options to choose from to register a student to the course.

First the content of the "Enrollments.csv" file is read and shown in a list of dictionary rows format to make the user aware of students that have already been registered before. Then, when option-1 is chosen it allows user to enter students details which are students first name, last name and course name. In option-2, user is presented with a comma-separated string formatting the collected data in option-1 using the print () function and displays the output in a 2-D list of dictionaries table format. In option-3, the program opens a file named "Enrollments.csv" in write mode using the open () function. It writes the content of the option-2 output to the file using the write () function, then file is closed using the close () method and displays the content of the CSV file as an output. And at the end when option-4 is chosen the program ends. Also, if user enters any other menu option apart from 1 to 4 then "Invalid option chosen" is displayed and the user is asked to enter the correct option.

The script incorporates elements such as taking input from a user for three of the variables and then using string formatting, conditional logic, while loops, Lists, Dictionaries, Error Handling and CSV file writing and reading.

Drafting the Code

Defining the Constant

I began writing my code in the PyCharm IDE. The script needed following constants to be defined:

- MENU a string data type which is defined as a block of text which is the menu of options.
- FILE_NAME a string data type which is defined as "Enrollements.csv"

Defining the Variables

The script needs a total of eight variables to be defined three of which are the inputs that needs to be taken from the user. All the eight variables are defined as following:

- `student_first_name` a string data type which is taken as an input from the user
- `student_last_name` a string data type which is taken as an input from the user.
- `course_name` a string data type which is also taken as an input from the user.
- `csv_data` a string data type that gets to store the formatted string.
- `menu_choice` a string data type which stores the menu option chosen by the user to execute.
- `file` an object data type which is used for file referencing while writing CSV when a user selects option-3.
- `student_data` as a dictionary data type which is used for storing the input of student information entered by the user.
- `student` as a list data type which is used for creating 2-D list tables (lists of lists).

Performing Operations

The script performs a total of six operations. Which are defined as below:

- First the script opens the already present “Enrollements.csv” file to read the content of the file and store it in a 2-D list of dictionary table format and then displays that output to the user.
- Second is when the user chooses Menu Option-1 where the user is then prompted to enter students first name, last name and the course name. And, then a comma-separated formatted string is created, stored and appended (in case of multiple entries) in `csv_data` variable. Also, the information entered by the user is added to the “`student_data`” dictionary and then that data is appended to the “`student`” list to create a 2-D list of dictionary rows table.
- Third is when the user chooses Menu Option-2 where a comma-separated formatted string (multiple strings in case of multiple student details entries) is displayed consisting of the three values entered in Option-1. Along with the comma-separated output a 2-D list of dictionary row table created in Option-1 is also displayed as the output.
- Fourth is when the user chooses Menu Option-3 where the comma-separated string generated in option-2 is written to a CSV file named “Enrollements.csv” and the content of same is displayed to the user.
- Fifth is when the user chooses Menu Option-4, and the while loop breaks and displays user that program has ended.
- And, if the user chooses any option other than between 1 to 4 then script presents user with “Invalid choice please choose options between 1 to 4” statement.

Saving the Script

I created a folder in Documents/Python_Files called “Module_5_Assignment” and saved my python script as “Assignment05.py”.

Testing the Code

I decided to use the Assignment05_Starter.py file. Where I worked on adding all the additional requirements that were there for Assignment05. Then, I ran the entire script at once and the code ran as expected for me (Fig-1). I wrote and tested my script in PyCharm. Then at the end I worked on adding the other requirement for the assignment which is adding the structured error handling for some specific parts which were mentioned in the assignment asks.

```
/Users/rgovil/Documents/Python_Files/Module_3_Assignment/Module03/.venv/bin/python /Users/rgovil/Documents/Python_Files/Module_5_Assignment/Module05/Assignment05.py
Initial content of Enrollments.csv File is as follows:
{'FirstName': 'Rakshit', 'LastName': 'Govil', 'CourseName': '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: 1
Enter the student's first name: Vic
Enter the student's last name: Vu
Please enter the name of the course: Python 100
You have registered Vic Vu 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: 1
Enter the student's first name: Meghansh
Enter the student's last name: Govil
Please enter the name of the course: Python 100
You have registered Meghansh Govil 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: 2
-----
Rakshit,Govil,Python 100
Vic,Vu,Python 100
Meghansh,Govil,Python 100

The collected data in a 2-D List of Dictionary Rows Format is as below:
[{'FirstName': 'Rakshit', 'LastName': 'Govil', 'CourseName': 'Python 100'}, {'FirstName': 'Vic', 'LastName': 'Vu', 'CourseName': 'Python 100'}, {'FirstName': 'Meghansh', 'LastName': 'Govil', 'CourseName': '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
The following data was saved to file!
Rakshit,Govil, Python 100
Vic,Vu, Python 100
Meghansh,Govil, Python 100
```

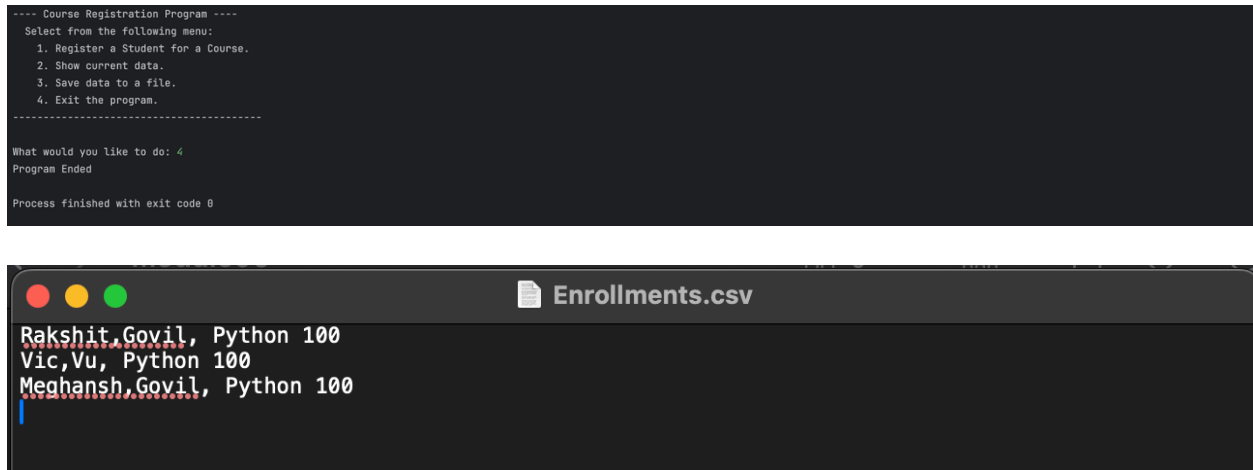


Fig-1: Screenshot showing the testing of the entire script and output of CSV File

Running the Script on Terminal

I opened the terminal console on my mac, navigated to the correct folder using the `cd` (change directory) and `ls` (list files) commands. Then I used the `python3` command along with the file name, `Assignment05.py` to run the script. And the script presented all the outputs and CSV File as expected. (Fig-2)

```

rgovil@rgovil-mbp ~ % cd Documents
rgovil@rgovil-mbp Documents % ls
Python_Files
rgovil@rgovil-mbp Documents % cd Python_Files
rgovil@rgovil-mbp Python_Files % ls
Module_1_Assignment    Module_2_Assignment    Module_3_Assignment    Module_4_Assignment    Module_5_Assignment
rgovil@rgovil-mbp Python_Files % cd Module_5_Assignment
rgovil@rgovil-mbp Module_5_Assignment % ls
Module05
rgovil@rgovil-mbp Module_5_Assignment % cd Module05
rgovil@rgovil-mbp Module05 % ls
Assignment05.py Enrollments.csv
rgovil@rgovil-mbp Module05 % python3 Assignment05.py
Initial content of Enrollments.csv File is as follows:
{'FirstName': 'Rakshit', 'LastName': 'Govil', 'CourseName': '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: 1
Enter the student's first name: Vic
Enter the student's last name: Vu
Please enter the name of the course: Python 100
You have registered Vic Vu 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: 1
Enter the student's first name: Meghansh
Enter the student's last name: Govil
Please enter the name of the course: Python 100
You have registered Meghansh Govil 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: 2

-----
Rakshit,Govil,Python 100
Vic,Vu,Python 100
Meghansh,Govil,Python 100

The collected data in a 2-D List of Dictionary Rows Format is as below:
[{'FirstName': 'Rakshit', 'LastName': 'Govil', 'CourseName': 'Python 100'}, {'FirstName': 'Vic', 'LastName': 'Vu', 'CourseName': 'Python 100'}, {'FirstName': 'Meghansh', 'Last
Name': 'Govil', 'CourseName': '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
The following data was saved to file!
Rakshit,Govil, Python 100
Vic,Vu, Python 100
Meghansh,Govil, 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

```

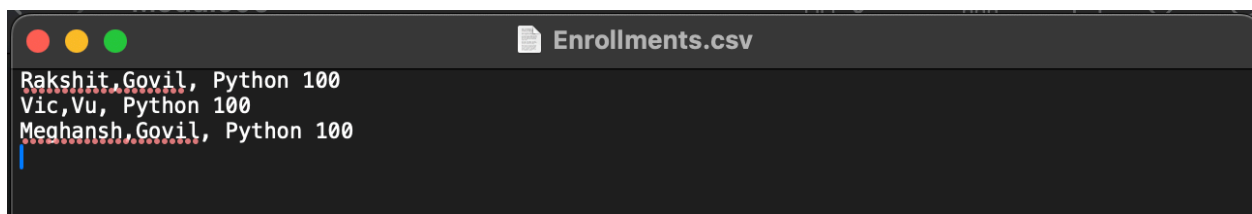


Fig-2: Screenshot showing commands to locate proper folder and running Assignment05.py

Summary

Using the Module 05 documentation and videos, and supplemental websites. I was able to successfully create a python script with all the required considerations. The program demonstrates my knowledge about programming tools and techniques including things like string formatting, conditional logic, while loops, using and creating Lists and Dictionaries and CSV file writing and reading along with Error Handling.