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11/21/2023

Python 100

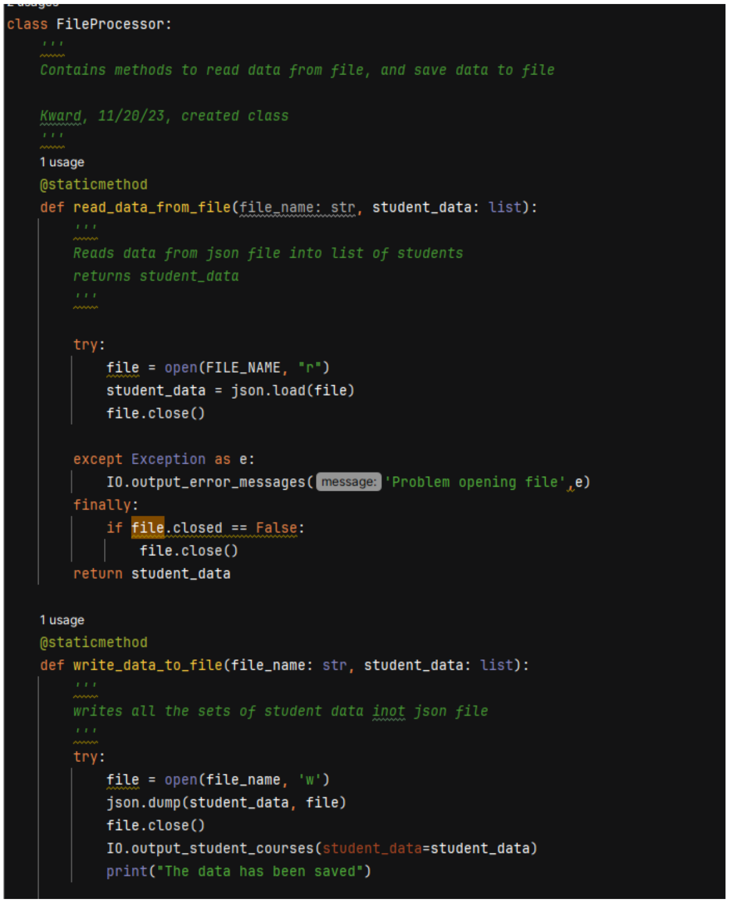
Assignment06

# Functions

In this assignment I put all of my code into functions and classes, to organize it, and also make it reusable.

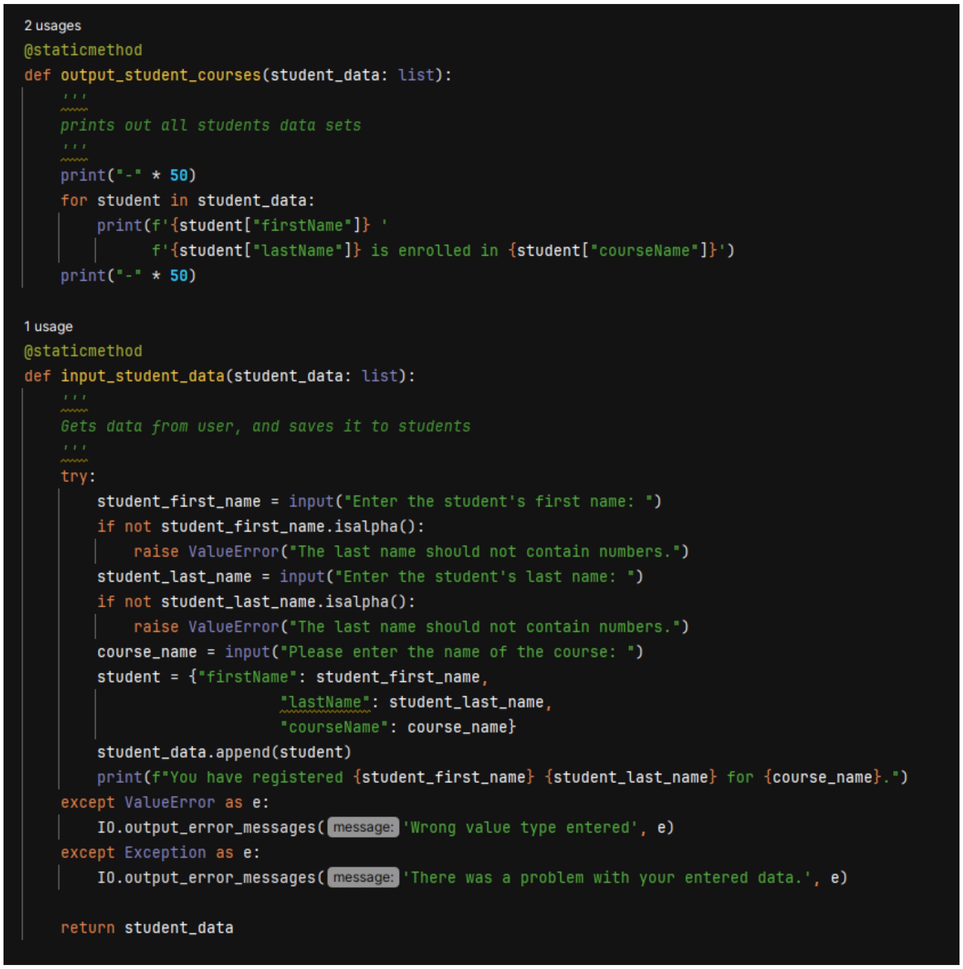
## Writing the Code

I started with creating the two classes, ‘IO’ and ‘FileProcessor’,  to put my functions in. Then I created all the functions listed in the assignment and put them into the correct classes. I pretty much just copied and pasted code into the functions, just making small adjustments. I did refer to the assignment 6 review video because I was confused on how to use student_data, and when to return it, and when to use students, but I figured it out.



```
class FileProcessor:
    '''
    Contains methods to read data from file, and save data to file

    Kward, 11/20/23, created class
    '''
    1 usage
    @staticmethod
    def read_data_from_file(file_name: str, student_data: list):
        '''
        Reads data from json file into list of students
        returns student_data
        '''

        try:
            file = open(FILE_NAME, "r")
            student_data = json.load(file)
            file.close()

        except Exception as e:
            IO.output_error_messages(message: 'Problem opening file',e)
        finally:
            if file.closed == False:
                file.close()
        return student_data

    1 usage
    @staticmethod
    def write_data_to_file(file_name: str, student_data: list):
        '''
        writes all the sets of student data inot json file
        '''
        try:
            file = open(file_name, 'w')
            json.dump(student_data, file)
            file.close()
            IO.output_student_courses(student_data=student_data)
            print("The data has been saved")
```

Figure 1: File processor class, and its functions

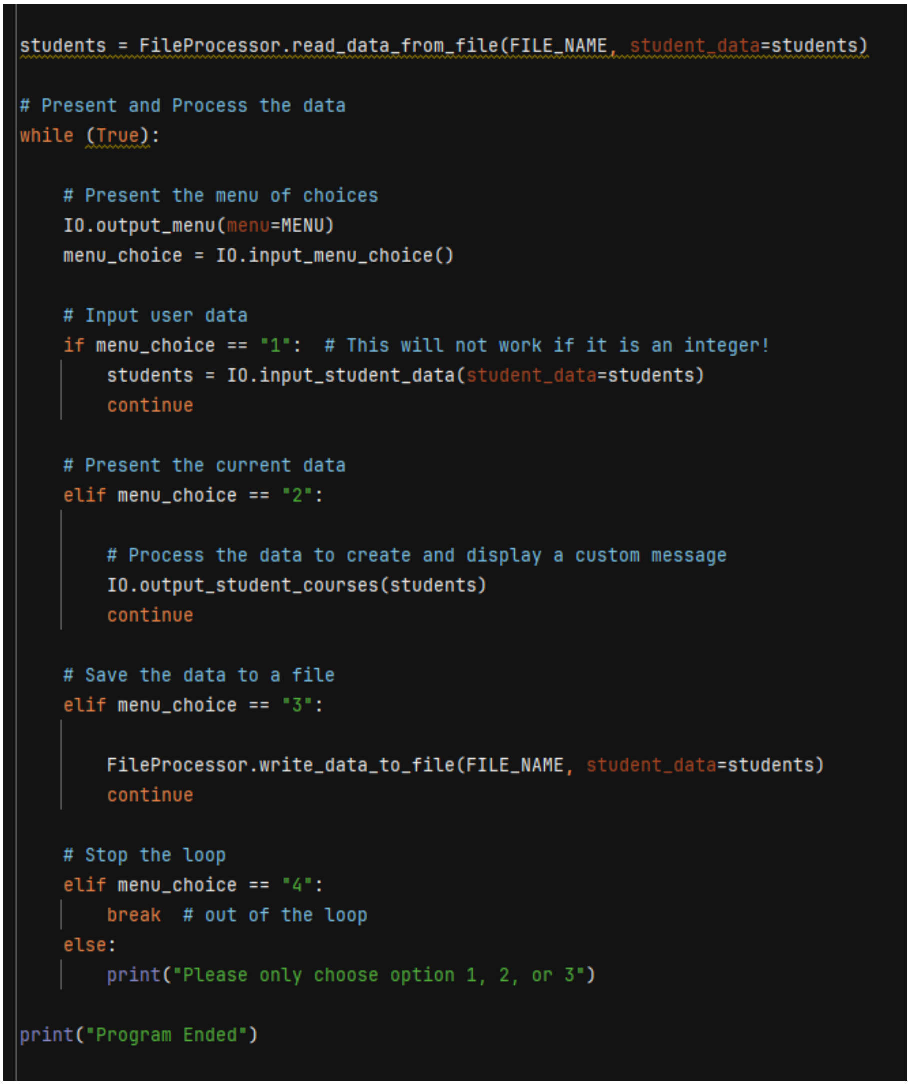


```
2 usages
@staticmethod
def output_student_courses(student_data: list):
    '''
    prints out all students data sets
    '''
    print("-" * 50)
    for student in student_data:
        print(f'{student["firstName"]} '
              f'{student["lastName"]} is enrolled in {student["courseName"]}')
    print("-" * 50)

1 usage
@staticmethod
def input_student_data(student_data: list):
    '''
    Gets data from user, and saves it to students
    '''
    try:
        student_first_name = input("Enter the student's first name: ")
        if not student_first_name.isalpha():
            raise ValueError("The last name should not contain numbers.")
        student_last_name = input("Enter the student's last name: ")
        if not student_last_name.isalpha():
            raise ValueError("The last name should not contain numbers.")
        course_name = input("Please enter the name of the course: ")
        student = {"firstName": student_first_name,
                   "lastName": student_last_name,
                   "courseName": course_name}
        student_data.append(student)
        print(f"You have registered {student_first_name} {student_last_name} for {course_name}.")
    except ValueError as e:
        IO.output_error_messages(message: 'Wrong value type entered', e)
    except Exception as e:
        IO.output_error_messages(message: 'There was a problem with your entered data.', e)

    return student_data
```

Figure 2: input and output functions

At some point while writing, something I did erased everything in the json file without me knowing, and my code stopped working. I was getting told that student_data was a noneType, even though it said it was a list when I hovered over it. It took me a while of searching for an issue, until I debugged and realized nothing was being put into student_data at the start. So I went into the file and put data back in and it worked fine.

Finally I just had to go into the main while loop and call all these functions, which was pretty straight forward.

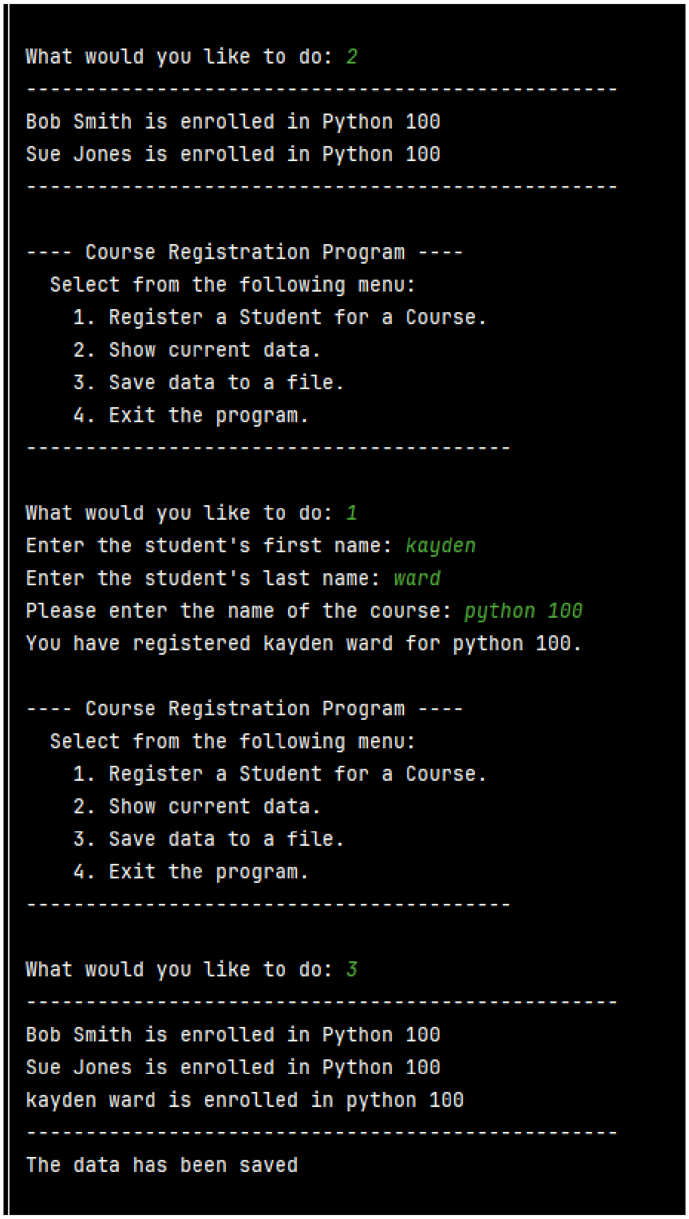


```python
students = FileProcessor.read_data_from_file(FILE_NAME, student_data=students)

# Present and Process the data
while (True):

    # Present the menu of choices
    IO.output_menu(menu=MENU)
    menu_choice = IO.input_menu_choice()

    # Input user data
    if menu_choice == "1":  # This will not work if it is an integer!
        students = IO.input_student_data(student_data=students)
        continue

    # Present the current data
    elif menu_choice == "2":

        # Process the data to create and display a custom message
        IO.output_student_courses(students)
        continue

    # Save the data to a file
    elif menu_choice == "3":

        FileProcessor.write_data_to_file(FILE_NAME, student_data=students)
        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: While loop

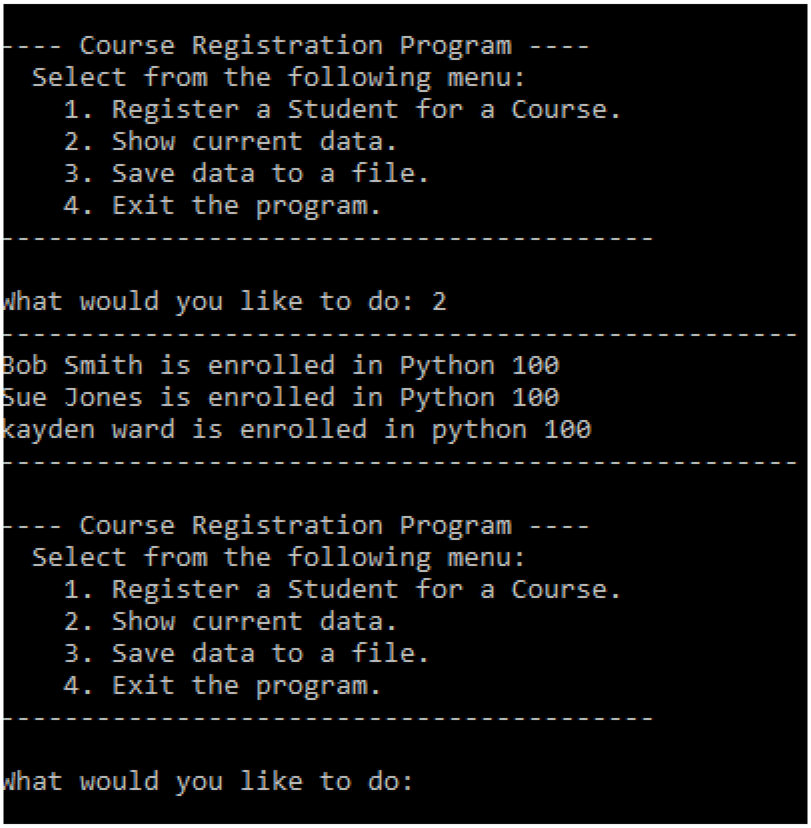
# Testing the Code

The code works in both PyCharm and the command prompt. I am able to load the data from the JSON file, add more data, save the new data, and print it all out.



```
What would you like to do: 2
--------------------------------------------------
Bob Smith is enrolled in Python 100
Sue Jones is enrolled in 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: kayden
Enter the student's last name: ward
Please enter the name of the course: python 100
You have registered kayden ward 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: 3
--------------------------------------------------
Bob Smith is enrolled in Python 100
Sue Jones is enrolled in Python 100
kayden ward is enrolled in python 100
--------------------------------------------------
The data has been saved
```

Figure 4: Code running in pyCharm



```
---- 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
--------------------------------------------------
Bob Smith is enrolled in Python 100
Sue Jones is enrolled in Python 100
kayden ward is enrolled in 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:
```

Figure 5: Code running in command prompt

## Summary

This assignment was a little confusing, but not too hard to figure out once I understood it. I was able to debug and fix the issues I did have. I think this was really good to help me learn functions and classes.