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IT FDN 110 A

Assignment 05

https://github.com/erickalucia/IntroToProg-Python-Mod05

Advanced Collections and Error Handling

Introduction

In this script we used new tools to work in Python including the data structure list of dictionaries, exception handling, and Github.

List of Dictionaries

Overview

A dictionary is a great tool for when we have data that follows the structure of a key and a value. A list is great for data that has consistent structure. We can combine these and make a list of dictionaries to store data. This is what we have done in this assignment and saved the data to a JSON file.

How to set up

A list of dictionaries was set up using student_data which is a dictionary of type string and string. This is the row of student data. A list of students was also used, this is for the table of student data. A json_data string is used to hold combined string data. And a file of type None is used to hold reference to an opened file. See Figure 1 for these variables. Figure 2 shows the dictionary of student_data including key-value pairs.

```
student_data: dict[str,str] = {}  # one row of student data
students: list = []  # a table of student data
json_data: str = ''  # Holds combined string data separated by a comma.
file = None  # Holds a reference to an opened file.
```

Figure 1 Variables

```
student_data = {'first_name':student_first_name,'last_name':student_last_name,'course_name':course_name}
```

Figure 2 Dictionary student_data

Adding Data

To add data to the list of dictionaries we get data from user and append to the table. See figure 3.

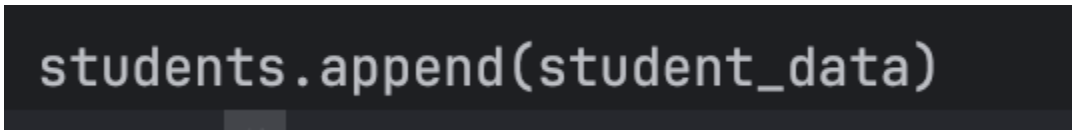

Figure 3 Append data

Processing data

Dictionary data is processed by using a for statement, for student in students, meaning that we are looking at each student in the list of students. We then use a print statement to write out a sentence using our data of student_first_name, student_last_name, and course_name.

```
for student in students:
    print(f"Student {student['first_name']} {student['last_name']} is enrolled in {student['course_name']}")
```

Figure 4

JSON files

Overview

JSON stands for JavaScript Object Notation and is similar to a CSV file. It is a great tool to use for data storage because it is easy to read and simple for computer systems to parse. JSON files consist of key-value pairs. Keys are in double-quotes and values are various data types like strings, numbers, objects, arrays, boolean, or null values. Commas separate out the key-value pairs as in Figure 5.

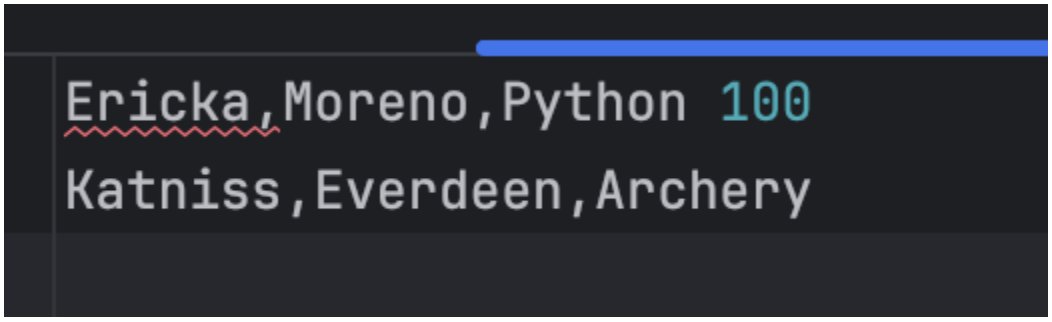

Figure 5 JSON file

Exception Handling

Purpose

Exception handling is a great tool to provide custom error messages and to better handle error messages within our code. It allows us to add customized messages to our errors and to catch errors before they halt the running of our code. These are great benefits during the development and also production phases of our development.

Try and Except

The try clause is the block of code we are asking the program to try and the exception is the handling of the code if there is an error in the try block. In figure 6 the try block is trying the write to file.

```
try:
    # For each student in the students list, write their first name, last name, and course name into JSON file
    file = open(FILE_NAME, "w")
    for student in students:
        csv_data = f"{student['first_name']},{student['last_name']},{student['course_name']}\n"
        file.write(csv_data)
    print("The following data was saved to file!")
    for student in students:
        print(f"Student {student['first_name']} {student['last_name']} is enrolled in {student['course_name']}")
# Catch error in saving data to JSON file
except Exception as e:
    print('Error saving data to file')
    print(e)
```

Figure 6 Try and Except Error Handling

GitHub

Overview

GitHub is great when working on a coding project with a team. It is also very useful for independent projects when we are making multiple commits and want to track our changes or share our code with other developers for review. GitHub allows a team of developers to work on the same repository and make commits to the same code. It serves as a central hub of information.

Setting up a new Repository

Figure 7 below shows a new repository in GitHub. To set this up I chose ‘new’ then added in the repo title and description and chose to add a ReadMe document. This repo will have files added to it including the script for assignment_05 and this PDF file.

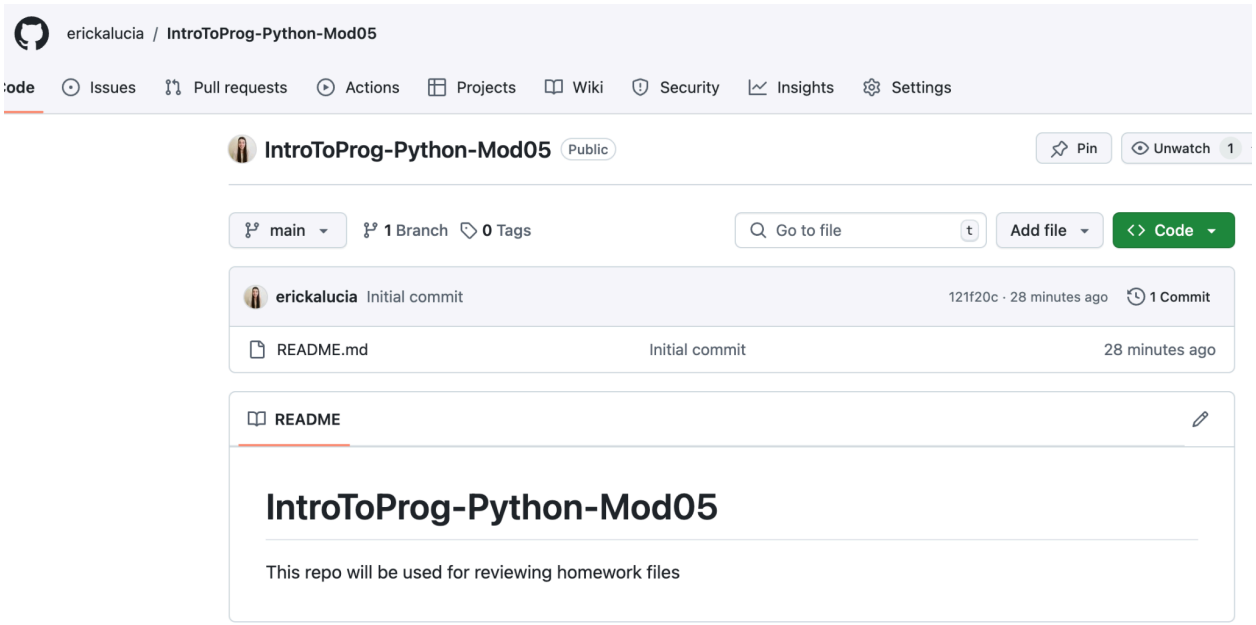

Figure 7 GitHub

Summary

Creating a list of dictionaries, exception handling, and github were all covered in this module. A list of dictionaries is a data structure that is useful for storing data where there are multiple sets of key value pairs. Exception handling is useful to gracefully handle errors and also catch custom errors. Github is a great tool to share repositories and work on projects with a larger team.