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Foundations of Programming: Python

Assignment 8

Repo: https://github.com/mah765/IntroToProg\_Assignment08

12/7/21

**Working With Classes**

**Summary**

* In this assignment, we were required to create a script that stores a list of products and their associated prices. Each product is in an instance of a “product” class, and the name and price are attributes/properties of that object.
* We were additionally required to incorporate error handling, as we learned in the previous assignment.
* The script initially reads in any existing products/prices from a file, and then asks the user to display, add, or write the new results back to that same file.
* We were required to run this script in both PyCharm and in a command window and show a screenshot of the output. We were also required to post the files to a new Github repository using Github Desktop.
* In the sections below, I provide more detail on this process, and provide screenshots to document key steps and outputs.

**Part 1: Creating the Script**

In PyCharm, I created a new project in the ‘Assignment\_08” directory and then opened a new Python script file. I then pasted in my syntax from the starter file and made some additions:

* The script first automatically reads in a list of products based on a relative path with a pre-specified filename. If no list is found, it prints an error message to the user, but then continues. It next prompts the user with a menu and waits for input. The user may choose to add items to the list, to remove an item, to write to an output (text) file, or to exit.
* There are three classes in this script: (1) a Product class, which defines the Product object and its attributes/properties, (2) a FileProcessor class, which contains static methods used for reading and writing data, and (3) an IO class, which contains methods for getting inputs from a user and creating/tracking Product objects.
* Each product is an instance of a class called “Product.” A Product object has two attributes: (1) a name, and (2) a price. These are private attributes and should only be accessed through the appropriate property methods/procedures.
* Whenever a new product is added, we create a new instance of a Product object. There is a class attribute called “totalProd” which keeps track of the total number of Product objects in existence at any one time.
* Some of the methods are static methods, which means they do not pertain to a specific object (though they still belong to a class). Other methods, like the property methods used to “get” and “set” Product object attributes, are not static.

**Part 2: Running the Script**

The next part of this assignment was to run the script I had just created. I first ran it directly in the PyCharm IDE, starting with a list file with the following items as a text file:

Graphical user interface, text, application

Description automatically generated

The initial read-in of this file was shown to be successful:

**Screenshot 1 of 3**

Text

Description automatically generated

After reading this file in from the text file, I added a new product called “C” with a price of 10.00, as shown in Screenshot 2. We see that the class attribute had increased to 3.

**Screenshot 2 of 3:**

Text

Description automatically generated

After saving the results to file, the text file now looked like this, including the new product “C”:

Graphical user interface, text, application

Description automatically generated

I then opened a command terminal window by typing “cmd” in the file directory bar. I then typed in “python Assignment\_08.py” to execute the script located within this folder. For this part, I chose to read in the data from the pickle file I had just created. The results of the script are shown below:

**Screenshot 1 of 1:**

Text

Description automatically generated

I also checked that the structured error handling enhancements were working correctly by trying to read in a file that did not exist. As shown in Screenshot 2 below, this threw an error message back to the user:

**Screenshot 2 of 2:**

Text

Description automatically generated

**Posting to Github**

Files were posted to the new repository located here:

**Conclusions and Observations**

In this assignment we extended our use of classes, and began working directly with objects (i.e., the products). It was immediately clear that objects can be useful programming constructs because they can hold information (in attributes) which varies from instance to instance. It was a little confusing to understand the difference between attributes and properties, though by the end of the exercise this distinction had become much clearer.