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IT FDN 110 A Au21: Foundations of Programming: Python

Assignment Module 08: Classes and Objects

GitHubURL: <https://github.com/GermanGornalusse/ITFnd100-Mod08>

How to Use Classes through the Creation of Objects-Instances and by the Application of the Static Method

Introduction

In this paper, I will show you how to create three different classes, using object-instances and applying the static method. In this example, the user will be prompted to enter a product name and a corresponding price. You will learn how to create a **Product** class to store the data for both variables. You will learn how this Product class will be useful to “bundle” this data and how you can create objects from this Product class. This class will have attributes attached to it to maintain its state and methods (of embedded functions) to modify it. You will also review the concept of the Static Method, applied to both a **FileProcessor** and an **I/O classes**. In this latter method, you will learn how to call the class directly, without making an object of its class.

In this exercise, you will apply the concept of error handling (“Try:Except” modules) and you will also be introduced to the **GitHub desktop** application.

For simplicity, I will assume you will be using Windows operating system.

Step 1. Create a subfolder in your C: Drive_PythonClass

The following instructions will allow you to create this subfolder in your hard drive:

C:/_PythonClass/Assignment08

- a) Left double click on “_PythonClass” folder (to open it)
- b) Right click> New > Folder
- c) Name the folder as Assignment 08_Yourlastname

I am showing you how the final path to this folder will look like (**Figure 1**):

📁 > This PC > Windows (C:) > _PythonClass > Assignment 08_Gornalusse

Figure 1. Path to the folder where you will save your Assignment 08. I used my last name (“German Gornalusse”) as an example to personalize my subfolder.

Step 2. Create a new Project in PyCharm

You will create a new project in PyCharm that uses the _PythonClass\Assignment08_last name folder as its location. I assume you will have installed PyCharm on your C:\ drive or on your desktop.

- Double click the icon “PyCharm Community Edition 2021.2.3”. Mine shows up on my desktop.
- Select: File> New Project
- In location type C:_PythonClass\Assignment08 to select the file subfolder wherein you will save your project. Alternatively, you can browse the destination folder by selecting the “open folder” symbol at the end of “Location” and manually by browsing and selecting the final folder. [See yellow arrow, on **Figure 2**]
- Select “New environment using Virtualenv” option. And “Create a main.py” welcome script option. [See orange arrow, Figure 2]. Make sure the Base interpreter is set “Python 3.10” (or the latest version you installed in your computer).
- Select “Create” (lower right corner of your screen). [**Figure 2**]

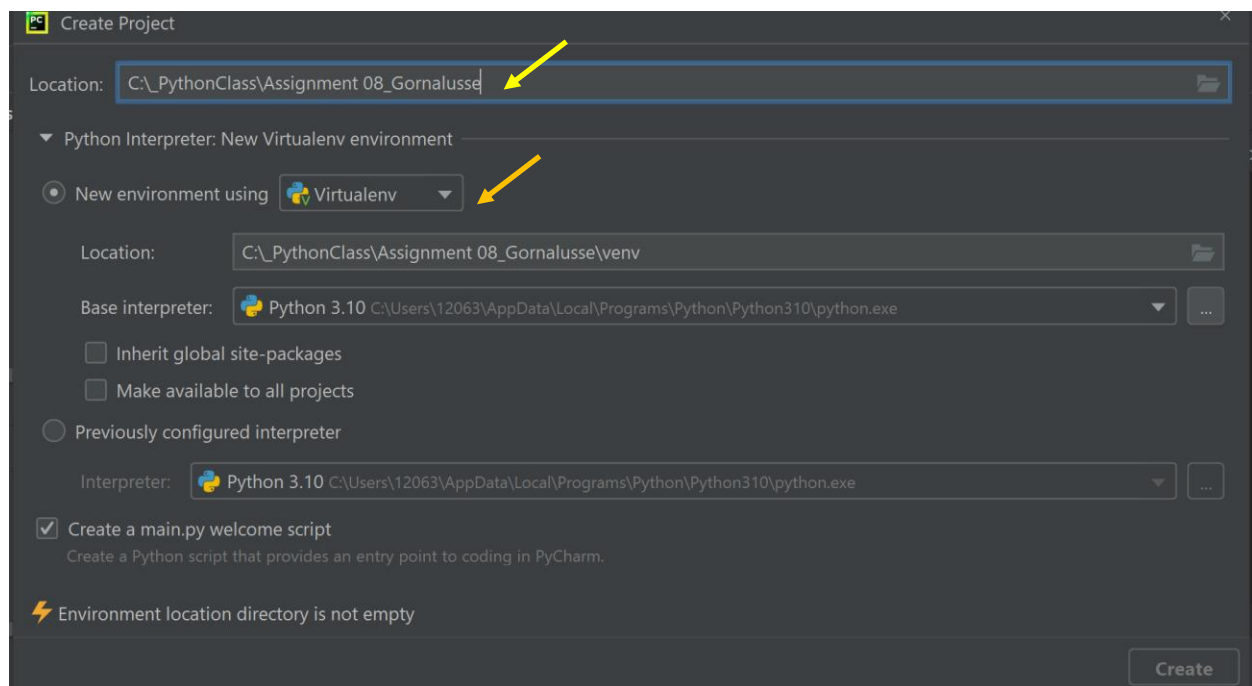


Figure 2 How to create a new project in C:_PythonClass\Assignment 08 subfolder using the IDE PyCharm

To do that:

a) File> Open

b) Select Assignment 08 subfolder

c) Select either “This window” or “New Window”. Notice how, on the left-hand side, the “Assignment 08” subfolder shows up. In **Figure 3** I am illustrating this example.

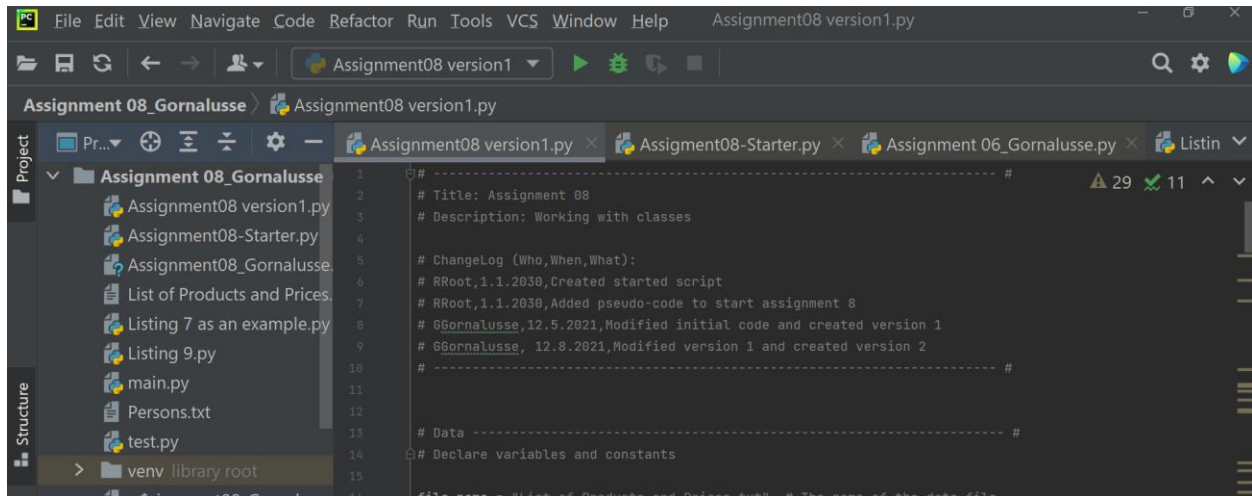


Figure 3. PyCharm window showing current folder where your Python scripts for the Assignment08 will be saved

Note # 1: In the Assignment08 project folder, I also saved ancillary files (e.g., Listing 7, Listing 9) because I used them as examples to build the final assignment. I will delete the “unnecessary” files before I upload them onto GitHub folder.

Note # 2: The initial script (draft) was saved as Assignment 08 version1. The final version to be corrected and graded will be named: “Assignment 08_Gornalusse”.

Step 3. Create a Python Script in the Project Folder: “Assignment08_Gornalusse” using as a template: “Assignment 08_Starter”.py

a) Right click (Context menu) Assignment 08 folder

b) File> New> Python File > Assignment 08_version 1

You will copy and paste the content of the script from Assignment 08_Starter (you previously have to drag this file to the Assignment 08_last name folder) to Assignment 08_version 1 file.

After you finish doing or the edits to this file, you will save the final file as “Assignment 08_last name” (in my case, Assignment 08_Gornalusse).

Below in **Figure 4**, you will see the Assignment 08_version 1 ran properly in the PyCharm console:

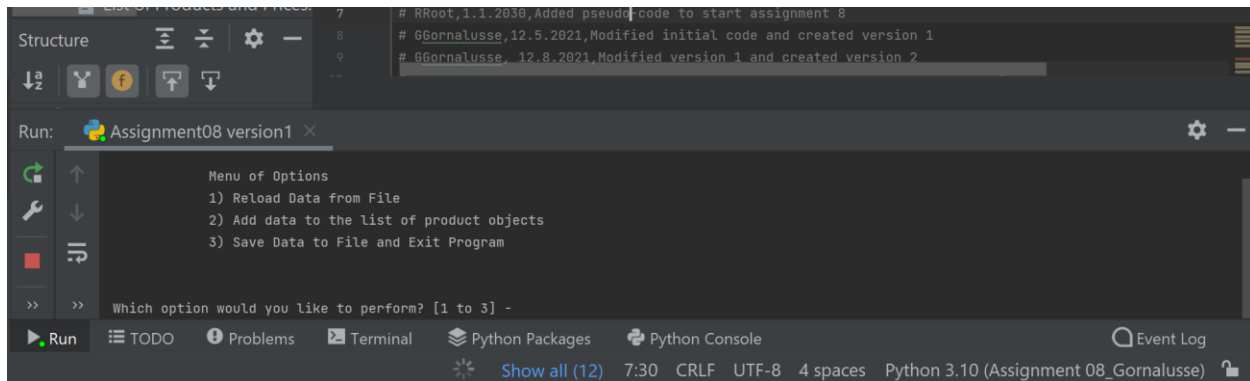


Figure 4. PyCharm console showing Assignment08.py running properly in the console

In the following **Figure 5** below, I illustrate how the assignment 08 worked properly once it is ran on OS command shell:

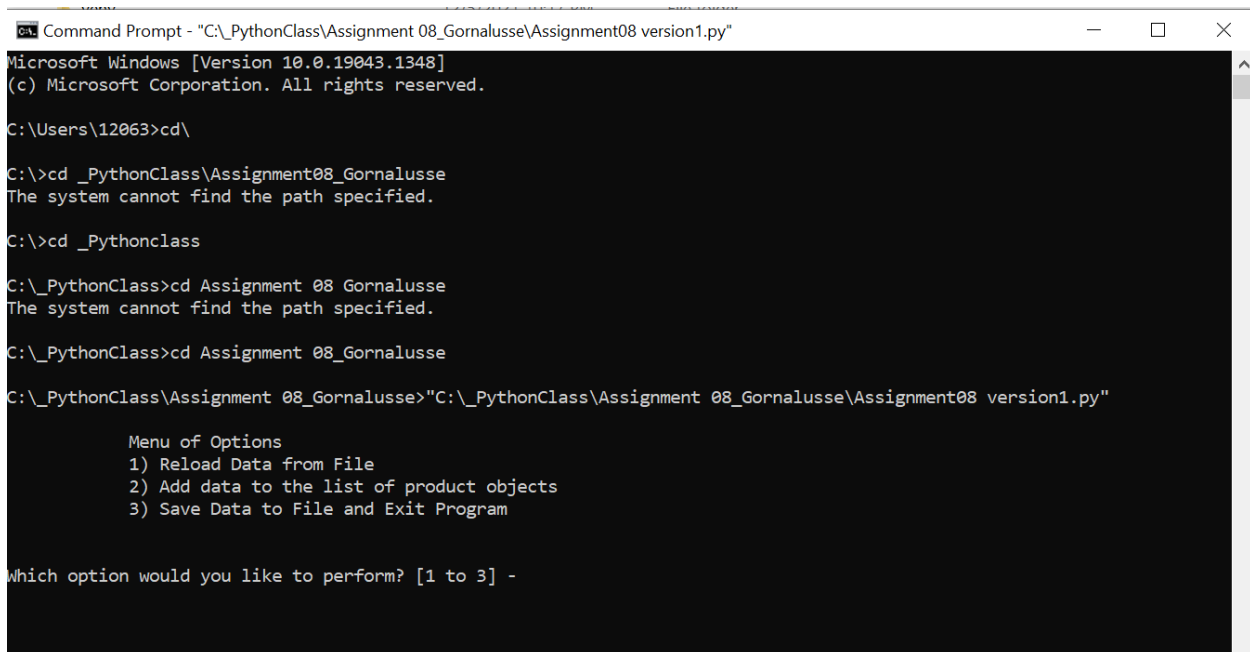


Figure 5. PyCharm can be ran correctly in the OS command shell

Step 4. Post Files to GitHub using GitHub Desktop

In this section, you will post your files (Word document and Python file) on a public GitHub repository.

a) Create a new repository called "IntroToProg-Python-Mod08" on your local computer. The pathway I used in my case is: "C:\Users\12063\Documents\GitHub\ITFnd100-Mod08\". The steps below will create a GitHub folder in your computer.

File > New Repository >

Give it a name and a description. Select “Create a repository” (**Figure 6**).

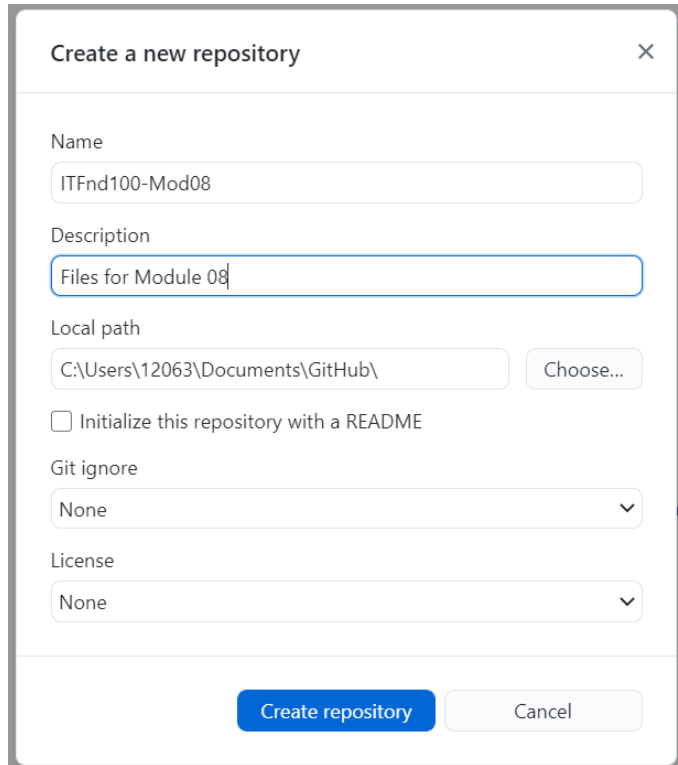
The image shows a 'Create a new repository' dialog box. It has a title bar with a close button (X). The form contains several fields: 'Name' with the text 'ITFnd100-Mod08', 'Description' with the text 'Files for Module 08', 'Local path' with the text 'C:\Users\12063\Documents\GitHub\' and a 'Choose...' button, an unchecked checkbox for 'Initialize this repository with a README', a 'Git ignore' dropdown menu set to 'None', and a 'License' dropdown menu set to 'None'. At the bottom, there are two buttons: 'Create repository' (highlighted in blue) and 'Cancel'.

Figure 6. Creating a new local repository

Copy your Python script and knowledge document (Word file) from your _Pythonclass folder ("C:_PythonClass\Assignment 08_Gornalusse", in my case) **into the local GitHub repository folder** "C:\Users\12063\Documents\GitHub\ITFnd100-Mod08\".

Review the new copied files in GitHub Desktop, add a title and description of the change, then click the "Commit to main" button to finalize the change.

To upload both of your files to the repository using GitHub Desktop's "Push origin" button (**Figure 7**).

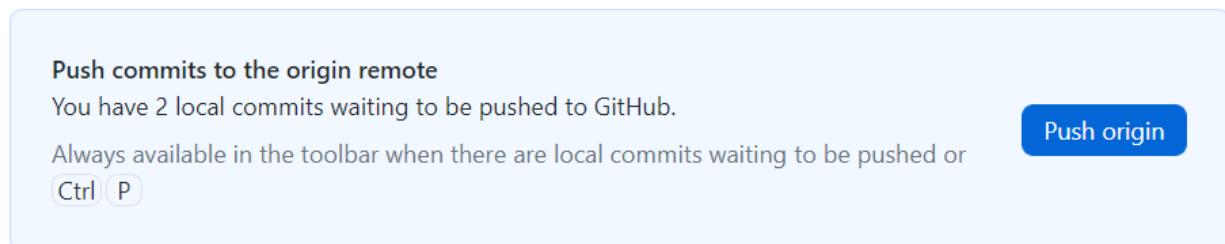


Figure 7. Uploading files with the "Push origin" button

Go to your GitHub website, login, and verify that the new repository and your files are there.

Summary

In this paper, you were introduced to the creation and usage of different type of classes. I showed you how you can store data from a product and a price the user entered. By doing so, you learned what a class is, how is the architecture of a class, its attributes, properties and methods. The most important concept is you will have practiced how you can create an instance of a class (akin to a “copy”) using objects. You will probably be able to practice the concepts you previously learned in other papers that covered the static method and error handling. The take-home message of this assignment is for you to conceptualize how by using classes, you can “bundle” data and functionality to streamline programming. In addition to this core concept, you will be able to upload your files to GitHub using the GitHub desktop application.