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Foundations of Programming: Python
Assignment 05

Creating a To Do List

Introduction

In this assignment and lecture I learned more about the difference between lists and dictionaries. How to use these collections to work with .txt files in order to read and write data. I also learned about how to organize my code in a more standardized fashion and a little bit about some simply type of error handling. Finally, I learned about GitHub and the version control software that runs on it.

Dictionaries v. Lists

One of the first and most important things that I learned about in this module was the difference between lists and dictionaries. While both of these are collections of data, they differ in how the data are referenced in them and the subscripts that they use. In lists are data are listed by using an index position in order to reference the specific data. For example, if I had a list of [1,2,3] and I wanted to get the value of 3 then I would reference index position 2 (since lists start at position 0). In a dictionary, elements are not listed on their own but rather as a key value pair. Every data is assigned key which serves as a reference for the value. A dictionary might look like the following {'First':1, 'Second':2,'Third':3}. Here if we wanted to get the value of 3, we would pass the key 'Third' as a reference in order to pull up that value. Like most built-in python functions both lists and dictionaries have various methods that can be called on them to perform functions.

Using collections to work with files

When working with data in python we can think of lists as rows of data in a spread sheet. It follows that dictionaries can be thought of in a similar vein with the keys representing table headers and the values being a row. Putting these two ideas together we can create a list of dictionaries which we can think of as a table.

We can read data from a file but using a for loop and using the .split() method to separate the data and load it as a list into python (assuming that the file is a CSV file). When we use the .split() method it separates the row of data in a file into a list separated by the character we passed into the method. From here we can list unpack in order to load the value into a list or dictionary (but if load into a dictionary we have to be sure to include a key for each value). This looks like the following (as taken from my code).

```
28      strFile = open(objFile,'r')
29      for row in strFile:
30          strData = row.split(',')
31          dicRow = {"Task":strData[0],"Priority":strData[1].strip()}
32          lstTable.append(dicRow)
33      strFile.close()
```

Code organization

There has been an effort in recent years to try and standardize code so that it all follows the same format to a certain degree. This is known as the "Separations of Concern". This is the idea that you should break up you code into distinct sections such that each section deals with a separate concern. Most programs can be divided into three sections: Data, Processing, and Presentation (for Input-Output). Doing this ensures that code is readable to other parties and things are where they are expected to be. Functions (which will be learnt about in the next module) play an important role in organizing data this way and would fall in the processing section so that they can be called later in the presentation section when the user inputs the data. A script template can be useful since it sets a standardized way to lay out code. This can help to make is readable to other people in an organization as well as save some time when setting up or making a new script.

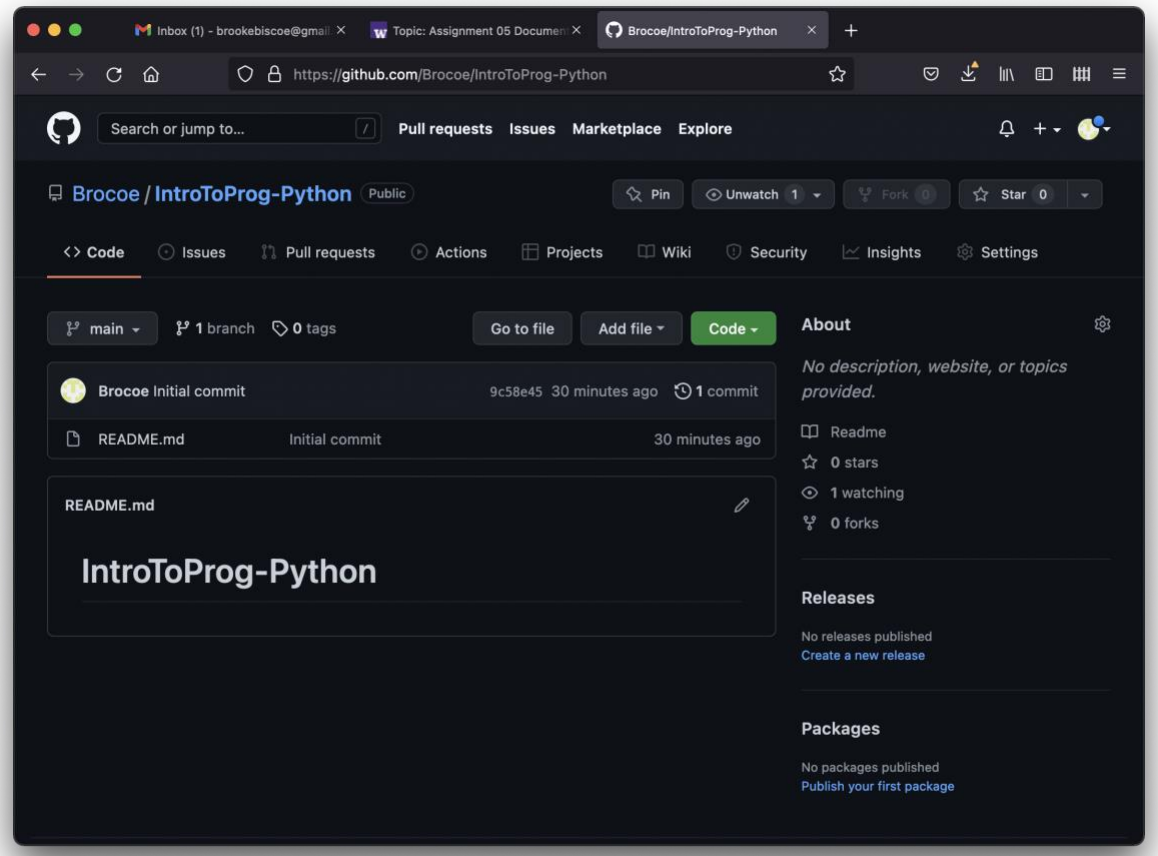
Basic Error Handling (Try-Except)

One of the final concepts that I learned about in this model was the Try-Except method. This involves using the keywords Try and Except to handle errors that may occur in code. In order to do this, you run a block of code indented in the 'Try' keyword. If there is error or a problem in that indented block of code, then the code in the 'Except' area will execute. This is useful to ensure that a program doesn't end or for making error message more readable to a user.

Github

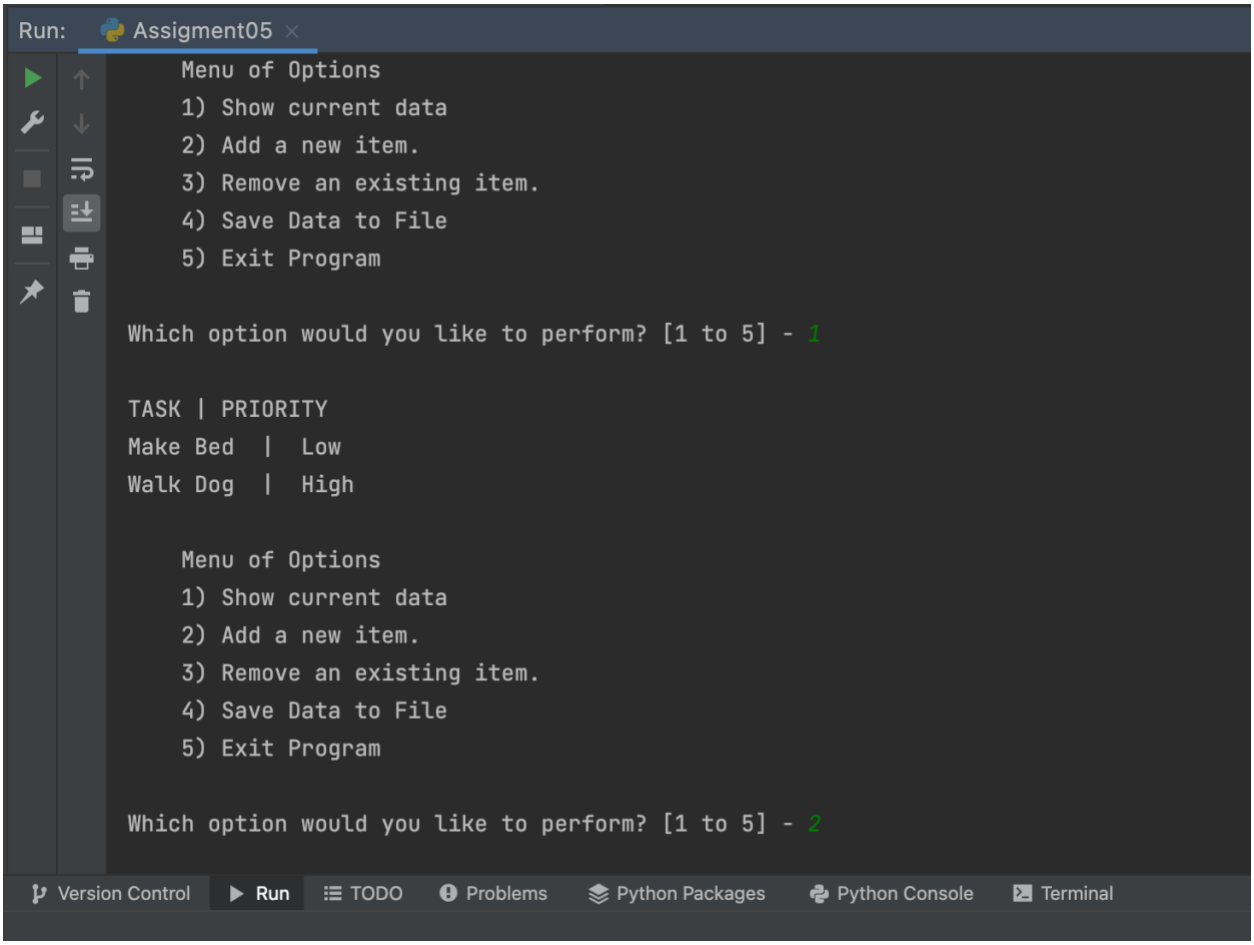
Github is an open-source, free to use, repository that be accessed via the internet. Git is a version control software that allows users to share code and track changes that are made to code that is posted there. This can be an excellent way to share code when multiple people are working on it to ensure that everything is kept organized.

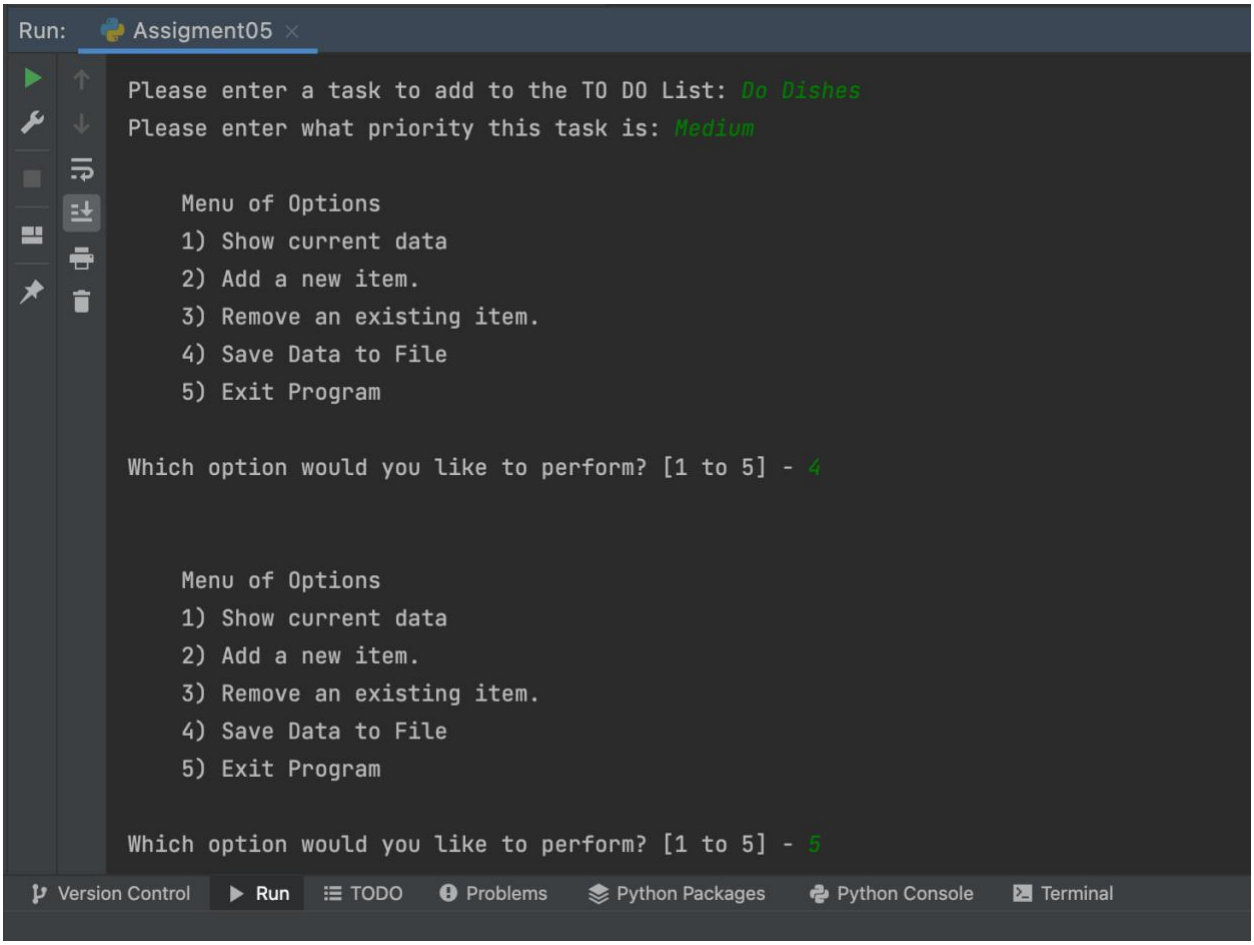
As part of the assignment this week I was asked to create a GitHub account. I have some prior experience coding, so I have used GitHub before. I am comfortable using my existing account for this class to below is a screen shot of my accessing my GitHub.

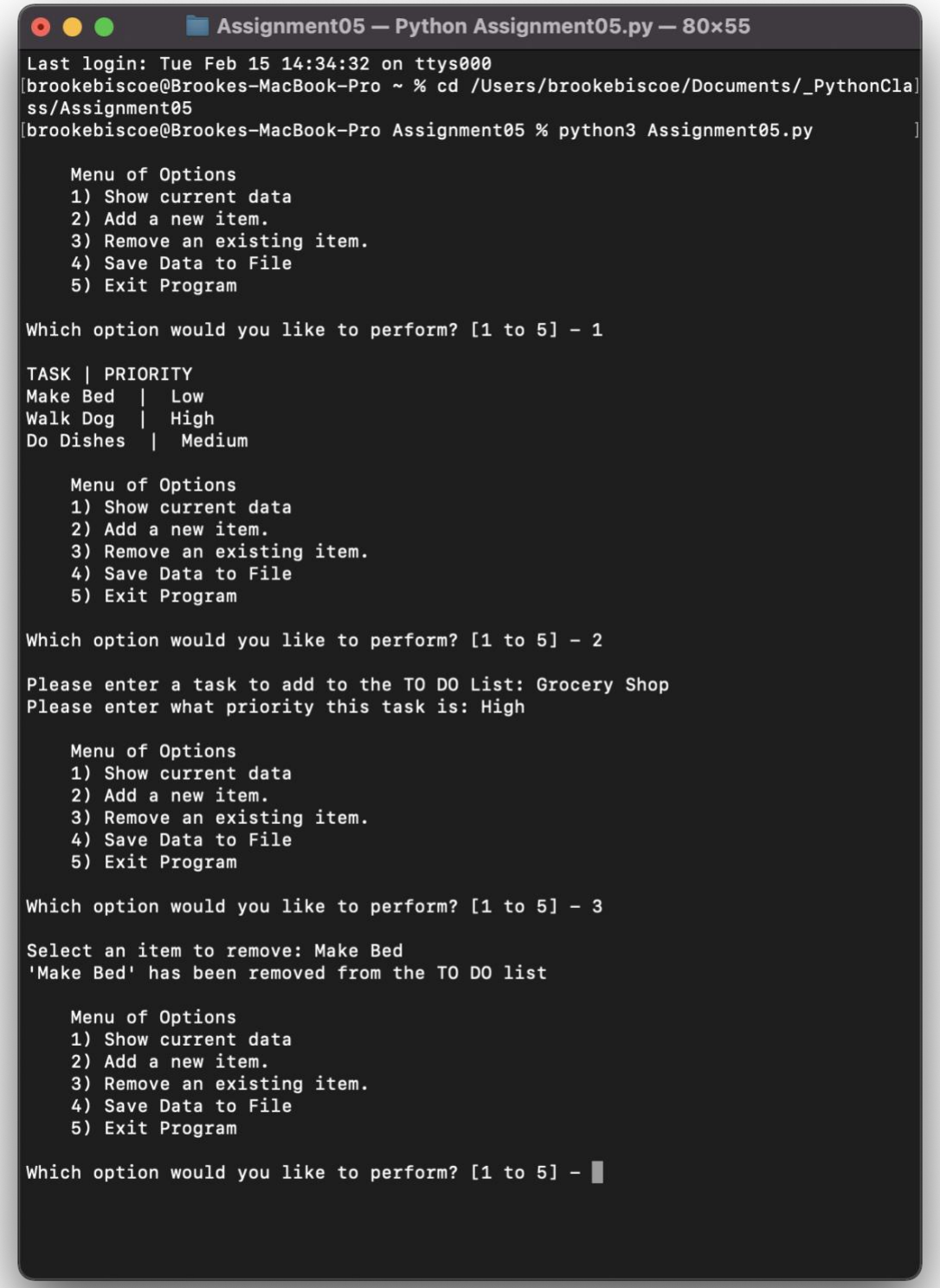


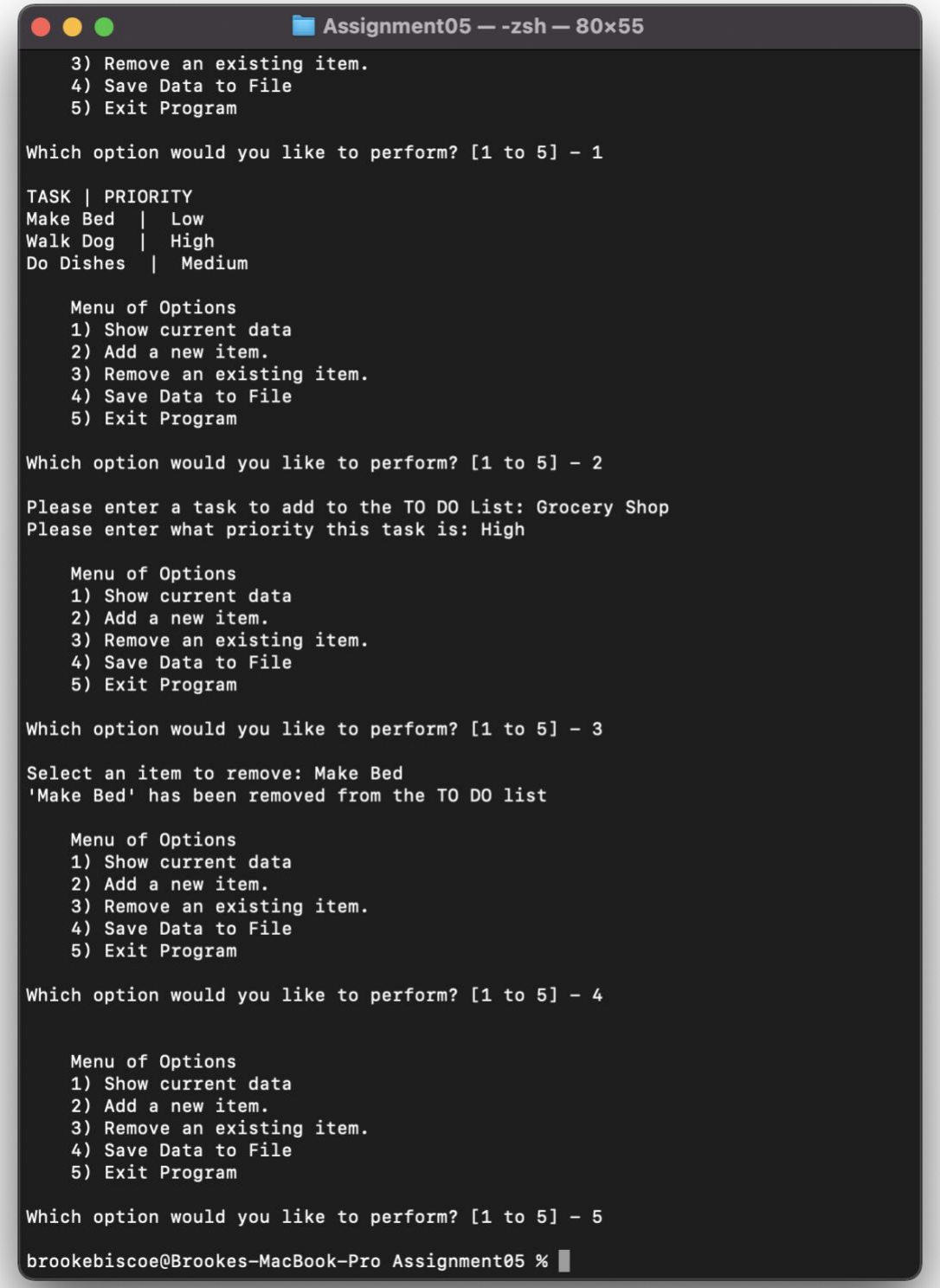
Assignment

For this assignment I was asked to expand on what I learned last week by having a menu of options for writing, reading and storing data to a file. I used a list of dictionaries in order to read and write my code from the .txt file. By saving the data as comma separated values it enabled easy reading and writing of my code. Below is an example of this code working. In PyCharm and from the command window.


Run:
Assigment05
Menu of Options
1) Show current data
2) Add a new item.
3) Remove an existing item.
4) Save Data to File
5) Exit Program
Which option would you like to perform? [1 to 5] - 1
TASK | PRIORITY
Make Bed | Low
Walk Dog | High
Menu of Options
1) Show current data
2) Add a new item.
3) Remove an existing item.
4) Save Data to File
5) Exit Program
Which option would you like to perform? [1 to 5] - 2
Version Control
Run
TODO
Problems
Python Packages
Python Console
Terminal


Run:
Assigment05
Please enter a task to add to the TO DO List: Do Dishes
Please enter what priority this task is: Medium
Menu of Options
1) Show current data
2) Add a new item.
3) Remove an existing item.
4) Save Data to File
5) Exit Program
Which option would you like to perform? [1 to 5] - 4
Menu of Options
1) Show current data
2) Add a new item.
3) Remove an existing item.
4) Save Data to File
5) Exit Program
Which option would you like to perform? [1 to 5] - 5
Version Control
Run
TODO
Problems
Python Packages
Python Console
Terminal


Assignment05 — Python Assignment05.py — 80×55
Last login: Tue Feb 15 14:34:32 on ttys000
[brookebiscoe@Brookes-MacBook-Pro ~ % cd /Users/brookebiscoe/Documents/_PythonCla]
ss/Assignment05
[brookebiscoe@Brookes-MacBook-Pro Assignment05 % python3 Assignment05.py]
Menu of Options
1) Show current data
2) Add a new item.
3) Remove an existing item.
4) Save Data to File
5) Exit Program
Which option would you like to perform? [1 to 5] - 1
TASK | PRIORITY
Make Bed | Low
Walk Dog | High
Do Dishes | Medium
Menu of Options
1) Show current data
2) Add a new item.
3) Remove an existing item.
4) Save Data to File
5) Exit Program
Which option would you like to perform? [1 to 5] - 2
Please enter a task to add to the TO DO List: Grocery Shop
Please enter what priority this task is: High
Menu of Options
1) Show current data
2) Add a new item.
3) Remove an existing item.
4) Save Data to File
5) Exit Program
Which option would you like to perform? [1 to 5] - 3
Select an item to remove: Make Bed
'Make Bed' has been removed from the TO DO list
Menu of Options
1) Show current data
2) Add a new item.
3) Remove an existing item.
4) Save Data to File
5) Exit Program
Which option would you like to perform? [1 to 5] -


Assignment05 — -zsh — 80×55
3) Remove an existing item.
4) Save Data to File
5) Exit Program
Which option would you like to perform? [1 to 5] - 1
TASK | PRIORITY
Make Bed | Low
Walk Dog | High
Do Dishes | Medium
Menu of Options
1) Show current data
2) Add a new item.
3) Remove an existing item.
4) Save Data to File
5) Exit Program
Which option would you like to perform? [1 to 5] - 2
Please enter a task to add to the TO DO List: Grocery Shop
Please enter what priority this task is: High
Menu of Options
1) Show current data
2) Add a new item.
3) Remove an existing item.
4) Save Data to File
5) Exit Program
Which option would you like to perform? [1 to 5] - 3
Select an item to remove: Make Bed
'Make Bed' has been removed from the TO DO list
Menu of Options
1) Show current data
2) Add a new item.
3) Remove an existing item.
4) Save Data to File
5) Exit Program
Which option would you like to perform? [1 to 5] - 4
Menu of Options
1) Show current data
2) Add a new item.
3) Remove an existing item.
4) Save Data to File
5) Exit Program
Which option would you like to perform? [1 to 5] - 5
brookebiscoe@Brookes-MacBook-Pro Assignment05 %

Conclusion

In this module I learnt about how to use dictionaries and lists and how using the two in combination can be thought of as a table of data in a spread sheet. I learnt how to read and write multiple data to a file and learnt about how to organize code in way that makes it easily readable to another person. Finally, I learnt about some basic error handling and how to use it to help make my code more readable to a user.