3.2 Lesson Summary - Reading, Writing, and Pyrithmetic

Python offers a number of tools to allow the user to access and manipulate data stored in other locations. Python can read and edit text files. Python also allows the user to organize their code in a number of different, useful ways including modules and functions.

Concept: Data that we wish to process is rarely stored in code files. Data can often be stored in text or csv files. Python can access the contents of a file using the **open** function. Accessing data in text files with Python is best performed using a **with** statement. The with statement insurers that the file will be closed regardless of the success or failure of the accessing operation. Once you have created a file stream using your with statement you can use the read function to access the contents of that file. If I want to print the contents of the important\_data.txt file you can use the following command:

*with open(‘important\_data.txt’, 'r') as my\_text\_file:*

*print(my\_text\_file.read())*

* Activity: 05-Ins\_BasicRead

Concept: Code functionality in Python is often stored away in **Modules**. This allows developers to share code that is useful for other developers. Python can continue to run efficiently by ignoring code in Modules that you don’t need to use. To access code in a Module you should use an **import** statement. There are a number of useful functions for generating random numbers in the **random** Module. To access this Module, you would use the following line of code:

*import random*

* Activity: 06-Ins\_Modules, 07-Stu\_ModulePlayground
* Suppl link: <https://docs.python.org/3/py-modindex.html>

Concept: Comma Separated Value or **CSV** files provide a lightweight portable way to store tabular data in a text file by separating the values with commas or some other delimiter. Rows are usually differentiated by a new line. Because CSV files are text files you can use the same *with* statement to open them. Parsing the CSV data is easiest when using the *reader* function *csv* module. To print all rows of a CSV file named my\_csv\_file.csv you could use the following code:

*import csv*

*with open(‘csv\_file.csv’) as csvfile:*

*csvreader = csv.reader(csvfile, delimiter=',')*

*for row in csvreader:*

*print(row)*

* Activity: 08-Ins\_ReadCSV, 09-Stu\_ReadNetFlix

Concept: Writing data to a CSV file is not dissimilar to reading data from it. The two main differences are you must open the file in write mode and you should use the *writer* method in the *csv* module. To write two columns to a CVS file named my\_cvs\_file.csv you could use the following code:

*import csv*

*with open(‘csv\_file.csv’, 'w') as csvfile:*

*csvwriter = csv.writer(csvfile, delimiter=',')*

*csvwriter.writerow(['First Column Data', 'Second Column Data'])*

* Activity: 10-Ins\_WriteCSV

Concept: When you wish to combine a group of lists or tuples into an object more closely resembling a table you can use the *zip* function. The zip function combines the lists into a zip object were the elements of the original lists are paired together based on their original order. A zip object is a group of tuples that can be iterated. So the result of the following code *print(tuple(zip((“first”,”second”), (“third”,”forth”))))* would be ((‘first’, ‘third’), (‘second’,’forth’))

* Activity: 11-Ins\_Zip, 12-Stu\_UdemyZip

Concept: A **Function** allow you to organize code into distinct unit. This allows you to distinguish code that works together to complete an operation. Functions also allows you to share and reuse your code. Copying and pasting code is usually frowned upon and can be prevented with the liberal use of functions. Functions are designated by using the *def* keyword. A simple function in Python that prints “Hello World” would have the following code:

*def function\_to\_print\_hello():*

*print("Hello World")*

* Activity: 13-Ins\_Functions

The functionality Python provides to read and edit CSV and text files is extremely useful when storing and accessing data. The ability to organize your code in modules and functions prevents you from duplicating your code and allows you to access only the code you need when you need it.