**Python – Session 5 Learning Activities: Files**

1. **Read**

Python\_Session05\_Slides.pptx

For the following examples you will need the data text files from Learn. The text files must be copied into the appropriate Python project folder (e.g. session05), the same folder your python files will be saved.

1. Input file Example (***input\_addams\_file\_example.py***)

The open() method is used to open files and specify how they will be used (reading, writing, appending etc.). This is an efficient way to read data from files as it provides good performance.

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| *''' This program will open a text file (addams.txt) and display the contents to the screen '''  # Pseudocode # Program input\_addams\_file\_example # OPEN "addams.txt" FOR INPUT AS input\_file # # FOR EACH line IN input\_file # OUTPUT line # END FOR # # CLOSE input\_file # END*  def main() is a function that controls the execution of our script. It is good practice to have this as it helps us to modularize the code by breaking a program into logical parts where each part is responsible for a specific task. The main() function will be the starting point for the Python script.  Create a file variable called input\_file to read (r) from the addams.txt file.  **def** main(): input\_file = open(**"addams.txt"**, **"r"**) **for** line **in** input\_file:  print(line, end=**''**)  Output the line read from the file and output a newline  For each line read from the file …  input\_file.close()   main()  The file needs to be closed when you have finished using it.  This is where our program starts. |

1. Output File Example

We can write to the same file (addams.txt) but we need to open this file in append mode first

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| *''' This program will open a text file (addams.txt) and display the contents to the screen. It will then request a name and append this name back to the file '''  # Pseudocode # Program input\_addams\_file\_example # OPEN "addams.txt" FOR INPUT AS input\_file # # FOR EACH line IN input\_file # OUTPUT line # END FOR # # CLOSE input\_file # # INPUT new\_name # OPEN "addams.txt" FOR APPEND AS output\_file # write new\_name TO output\_file # CLOSE output\_file # END*  Now open the addams.txt file for append mode (a). If we opened the file using “w”, all contents will be erased.  **def** main():  input\_file = open(**"addams.txt"**, **"r"**)   **for** line **in** input\_file:  print(line, end=**''**)   input\_file.close()   new\_name = input(**"\nEnter your name:"**)  output\_file = open(**"addams.txt"**, **"a"**)  output\_file.write(new\_name)  output\_file.write(**"\n"**)  output\_file.close()  main() *# Variable new name is out of scope here # print(f"The new name is{new\_name:s}")*  We need to write a new line character to the file as the write() statement does not do this for you.  Trying to access the variable new\_name here will give you an error as this variable is only used inside the main() function. Try it, uncomment this line and run the script. |

1. Write a program to read in 5 employees’ hours of work (integers) from the text file empHours.txt. Calculate the employees pay as the hours multiplied by the pay rate of $27.50 per hour and output the hours and pay to the screen.

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| *''' This program will read in 5 employees’ hours of work (integers) from the text file empHours.txt. It will calculate the employees pay as the hours multiplied by the pay rate of $27.50 per hour and output the hours and pay to the screen. '''  # Pseudocode # Program payroll\_file\_calc # # PAY\_RATE = 27.5 # # OPEN "empHours.txt" FOR INPUT AS input\_file # # OUTPUT heading # # FOR EACH line IN input\_file # hours = line # pay = hours \* PAY\_RATE # OUTPUT hours, pay # END FOR # # CLOSE input\_file #  # END* **def** main():  PAY\_RATE = 27.5   input\_file = open(**"empHours.txt"**, **"r"**)   print(**'{:>5}{:>10}'** .format(**'Hours'**,**'Pay'**))  Read each line of the file and convert the hours to integer using int()  This will format hours to use 5 character spaces and right justify the output, and format pay to using 10 character spaces and right justify the output.  *# this allocates 5 positions for the first heading  # and 10 positions for the second heading  # and right aligns them(>)  # or you could use a simple print(‘Hours Pay’)* **for** line **in** input\_file:  hours = int(line)  pay = hours \* PAY\_RATE  print(**f"{hours:5d}{pay:10.2f}"**)   input\_file.close()  main()  What happens if you try and access PAY\_RATE here (after main())? Why? |

1. Write a program to input the beers.txt file and output this to the screen. Add your own beer to the file. Remember to add the main() function.
2. Write a program that will read and output the student scores from the text file scores.txt. It will also calculate the total and average of all scores and output the number of scores and average to the screen.
3. Make sure you have completed Assignment part 1 – check Learn (are any resubmissions required??)
4. Start Assignment part 2.