

CSC108H Week 6 Lab

To earn your lab marks, you must actively participate in the lab. *You do not need to finish in the time allotted, you just need to arrive on time and try hard.*

1 Objectives

- Practice reading from text files.
- Practice processing files.

2 Driver and navigator

driver: The person typing at the keyboard.

navigator: The person watching for mistakes and thinking ahead.

The rest of these instructions call you `s1` and `s2`. Pick which one is which. `s1` should log in, start up Wing, and be the first driver.

3 Reading text files: practising the basics

The `media` module contains a function called `choose_file`. This function returns a string: the name of the file selected by the user. Instead of using `raw_input` to obtain a filename, we could use this function to provide the user a graphical way to select a file.

We can open a text file by using its name as the argument for the `open` function. In this section, you will practice opening the files `lab6a.txt` and `lab6b.txt`. You should download these files from the labs section of the course web site.

In the Python shell, do the following:

- (a) Import the `media` module.
 - (b) Call `choose_file` and choose `lab6a.txt`. Associate a variable `file_name` with the string returned from this function.
 - (c) Call `open` with `file_name` as the argument, and associate `input_file` with the value returned from the function. `input_file` now refers to an object of type `file`. Use `dir` and `help` to find out about methods that `input_file` has. Read the help information for `readline`. (“EOF” stands for “End Of File”.)
 - (d) Call `input_file`’s `readline` method. Observe what happens. Call the `readline` method again.
 - (e) Keep calling the `readline` method until you are sure it returns nothing but **an empty string**.
 - (f) Call `input_file`’s `close` method. Show your TA your work and switch roles.
- (a) Now, open `lab6b.txt` by calling `choose_file` and `open` as above. As before, use the variable name `input_file` for the open file object.
 - (b) Write a “for” loop that prints every line in `input_file`. You should not need to call `readline`; instead, the for loop should iterate over the lines of the file. When you are done, `close` the file.
- Open `lab6b.txt` again. Write another loop, similar to the one above, but print only the lines which contain the strings “LOL” or “lol”. (Hint: look up the `find` method for strings with `help(str.find)`). Show your TA your work.

4 File processing

This section of the lab will involve processing temperature data stored in a file. Download the file `w6.py` from the Labs page of the course website.

That file contains headers (with `docstring` comments) for functions that you need to implement. To complete the functions, follow the instructions below:

- First, finish implementing the helper function `open_temperature_file`. Once implemented, you will call it with this URL:

`http://robjhyndman.com/TSDL/data/cryer2.dat`

Note that this data file contains a description at the top, and your function `open_temperature_file` will need to skip that description, as the `docstring` says. Hint: there is a method of `urllib` that takes a URL and returns an object that supports the usual file methods.

Second, finish implementing the function `avg_temp_march` and make sure that it produces the correct result for the data at the URL above.

Switch roles: s2 drives and s1 navigates

- The next function to implement is called `avg_temp`. It will do the same thing as `avg_temp_march`, but it is more general: it will find the average temp for *any* month, not just for March. Copy your `avg_temp_march` code to the `avg_temp` function and make a small change to it, so that it works with any month. Show your TA that it works.
- Implement the function `higher_avg_temp`. Call the function with the URL above and open the URL in the function. With your partner, discuss the test cases that you would need to use to verify this function. If you aren't sure how many test cases are necessary, ask your TA.

Switch roles: s1 drives and s2 navigates

- Implement the function `three_highest_temps`. Call the function with the open URL above.

Switch roles: s2 drives and s1 navigates

- Implement the function `below_freezing`. Call the function with the open URL above. Show your TA that it works.