Exercise Set 4

Introduction

This exercise set focuses on the use of `datetime` module functions and a review of previous course topics such as file reading and string operations. Many of the exercises here will operate on the messages.log file. **Download the support file for development and testing (https://cbu.instructure.com/courses/9073/files/1187094?wrap=1) (https://cbu.instructure.com/courses/9073/files/1187094/download?download_frd=1)** .

ex_4_0.py

In this exercise you will work with the `messages.log` (https://cbu.instructure.com/courses/9073/files/1187094?wrap=1) (https://cbu.instructure.com/courses/9073/files/1187094/download?download_frd=1) file. In a module called `ex_4_0.py`, implement a function called `get_shutdown_events(logfile)` that returns log entries where shutdowns were initiated. Here's an example of the lines of interest. Note that other log entries are also included in the file.

```
INFO 2014-07-03T23:27:51 supybot Shutdown initiated.
INFO 2014-07-03T23:27:51 supybot Killing Driver objects.
...
INFO 2014-07-03T23:31:22 supybot Total CPU time taken: 1.12 seconds.
INFO 2014-07-03T23:31:22 supybot No more Irc objects, exiting.
...
INFO 2014-07-03T23:31:22 supybot Shutdown initiated.
```

Your function should implement the following:

- opens the filename argument `logfile`
- returns a list of lines where a shutdown was initiated.
- If no shutdown lines are found in the list, your function should return an empty list.

ex_4_1.py

In a module called `ex_4_1.py` create a function called `num_shutdowns(logfile)` that uses your function from `ex_4_0.py` to count and return the number of shutdowns present in the file with name `logfile`.

Your function should *return* the integer count of shutdowns present in the file. *Note: a single shutdown event will have two entries: "Shutdown initiated" and "Shutdown complete"*

ex_4_2.py

In a module called `ex_4_2.py` create a function called `logstamp_to_datetime(datestr)` that takes in an input date string of the following format (note that date fields are largest to smallest).

```
2014-07-03T23:31:22
```

Your function should parse the `datestr` argument and return a `datetime.datetime` object.

ex_4_3.py

Write a function `time_between_shutdowns(logfile)` that takes in a filename for a log file such as `messages.log` and returns the amount of time between the *first* and *last* shutdowns as a `datetime.timedelta` object.

Your function should:

- pass the `logfile` argument to `get_shutdown_events()` from `ex_4_1.py` to get the shutdown entries.
- for the first and last shutdown entries, convert the date field to a `datetime.datetime` object using `logstamp_to_datetime()` from `ex_4_2.py`.
- Compute the difference in time between the two events using the appropriate order (the value should be positive).
- return the resulting `datetime.timedelta` object.