Quiz #7 (Top-Down Design and File Output)

ENGR 102 (Spears)

Follow good coding practice as discussed in class, and include the standard header and useful code comments.

Part 1: *(5 points)*

Which of the following best describe advantages of the top-down programming design method as discussed in class (select all that apply):

- Clarifies what project steps needs to be done
- Easy to reuse work from previously completed projects
- Difficult problems become less complicated and easier to solve
- Easy to divide work, so more than one person can contribute
- Easy to find relationships between several nodes of the project

Part 2: *(19 points)*

Consider that you are part of a team working on a project that:

a. Reads sensor data regarding
   - the volume of crude oil entering your refinery over time (flow rate, measured in gallons per minute)
   - the temperature of the crude oil (measured in °C)

b. Averages the readings over a one hour timeframe to create values for the *hourly average temperature* and *hourly average flow rate*.

c. Writes these data to a file named refineryInletLog.txt

Your task is to create the steps of the program that writes the log file, while your teammates work with the first two tasks. Your teammates have specified that the sensor data will be gathered and stored as a list-of-lists containing the entire day's information in the following format:

sensor_data = [[<*temp1*>, <*flowrate1*>], [<*temp2*>, <*flowrate2*>], …, [<*temp24*>, <*flowrate24*>]]

The log file should be saved as refineryInletLog.txt, and include the following:

- a line with the refinery name (make one up)
- a line with the date (you can type out today's date for this quiz)
- a line of dashes as a separator
- both pieces of data, formatted similar to the following example:

```
Flattering Rabbits Refinery
Log Date: Oct. 30, 2019
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Time   Avg Temp   Avg Flowrate
(hr)       (C)          (gpm)
   1     40.56         85.945
   2     40.75         87.112
  ...      ...            ...
  24     38.15         96.097
```

When finished, copy your code into the submission blank on eCampus.