

CE 232 Python Programming

Apr 25, Thursday 9:45 a.m. - 11:45 a.m.

2019 Spring Final Exam (This is an O3 Exam)

(Solutions must be sent to homeworkflc02@gmail.com)

1. **(20 points)** Given that the `.split()` function can split a string into pieces using certain separators (search for it for examples if it is new to you). For example, I can split a string by commas using this: `exampleString.split(',')`.

Now, **define a function** that passes a sentence (a string) inside the function and returns a dictionary that shows all the words as the keys in the dictionary and the frequency of these words as values.

Test your code using this sentence: 'Rah, rah, ah, ah, ah, roma, roma, ma, Gaga, ooh, la, la, want, your, bad, romance'.

2. **(20 points)** The data collected in the spreadsheet 'data.xlsx' has 3 worksheets: 'data1', 'data2', and 'data3'. Use your Python code to detect if any of them have data in there. If data is detected, plot all temperature data and their deviations (error bars) versus time for the year of 2018 use a line chart.

The figure should be presentable: with a proper title, X and Y axis labels, and a legend.

3. **(40 points)** (1) Create a singly linked list class that has the `__init__()` constructor and the methods of `append`, `print_list`, and `prepend`. Create a `Node` class. Add a method in the singly linked list class to enable inserting a data at a certain location in the list. (The location is provided by the user as one of the arguments of the method).

(2) Design a method to move the second last node of a singly linked list to the front (as a head node).

Draw the diagram to receive some partial credit if you need.

4. **(20 points)** Create a very simple GUI that only contains a push button using **Qt Designer**. Convert it into a .py file. Manually add some python script in the .py file to let the user clicks the push button to close this window. (Refer to the examples in the Tutorial of Apr 1 and Apr 10 on my website for your reference.