Python Quiz (Optional - Not Graded)
CSCI 3202

September 11, 2019

This is a short quiz for you to check your understanding of basic python programming. This is an optional, non-graded but recommended assignment as it will help you get used to both Python as well as the online submission platform on Gradescope. To solve these questions please use the provided *solution.py* file (it has all the required TODOs except for Question 5) and once you are done, follow the instructions at the end of this document to submit on Gradescope.

Question 1

Complete this function to count the number of characters (character frequency) in a string.

```
def char_frequency(input_string):
  """Returns a dictionary containing letters as keys,
     and corresponding frequencies in input_string as values
     Example Input: intelligence
     Example Output:
     {'i': 2, 'n': 2, 't': 1, 'e': 3, 'l': 2, 'g': 1, 'c': 1}
  """
  # TODO: Your code here
```

Question 2

Complete this function that takes a sentence as input, and returns a list of unique words in sorted order from the input sentence. Please ensure that your function converts the input string into lower-case entirely before sorting to avoid duplicate words due to differences in case. When returning words, make sure all words are in lower-case.

```
def unique_words(sentence):
  """Returns a list of unique words in sorted order from sentence.
  Example Input: The quick brown fox jumped over the quick brown cat
  Example Output:
  ['brown', 'cat', 'fox', 'jumped', 'over', 'quick', 'the']
  """
  # TODO: Your code here
```

Question 3

Complete this function that takes 2 lists as input and returns True if there is at least one element in common.

```
def has_common(list1, list2):
  """Returns a True if list1 and list2 have at least 1 common element.
  Example Input: [1,2,3,4,5], [5,6,7,8,9]
  Example Output: True
  """
  # TODO: Your code here
```

Question 4

Part a

Complete the TODO in this class's *area()* method.

```
  class Rectangle:
    def __init__(self, l, w):
      self.length = l
      self.width  = w

    def area(self):
      """Returns the area of the rectangle"""
      # TODO: Your code here
```

Part b

Add a method *perimeter(self)* to Rectangle class to return the perimeter of the rectangle.

Part c

Add a method *is_bigger(self, target)* that takes another Rectangle object called target as an argument and returns *True* if the rectangle is bigger than the target rectangle in area or *False* if the target rectangle has a bigger area.

Question 5

Create a class called NumberConverter that has the following methods [1]:

- *to_roman(num)*: Converts the integer argument *num* to a Roman numeral string, and returns the string.
- *to_decimal(input_string)*: Converts the Roman numeral string argument *input_string* to an integer and returns it.
- *switch_format(data)*: Identifies whether the argument *data* is an *int* or a *str* and if it is an *int* converts it to a Roman number string, and returns the string. Otherwise, if *data* is a *str*, it converts it to an integer assuming the string is a Roman number and returns the integer. (*Hint: use the above two methods when defining switch_format*)

Submission Instructions

Once you have completed *solution.py* head over to `https://www.gradescope.com/courses/58766/assignments/239587` and upload your *solution.py* file. The autograder will then evaluate your code and gives you a score out of 16. [2]

[1] Please ensure that you use the exact same names as mentioned here for your methods and class name. Your submission is autograded and the software requires the names to be consistent

[2] This score doesn't count towards your grade, its just a measure for you to evaluate your performance on the quiz.