CSci 1500 - Test 2 - 100 pts. Name Answers

Directions: For the purposes of this test you do not need to add the beginning docstring with your name and date. Functions do not need to include examples. Functions and programs should have a description and type contracts, but you can forgo the other documentation on this test. Please give only what is asked for. Do not waste time doing things you are not asked for.

1. Total all parts (25 pts.)

   a) For the string `s = "Because I'm happy"` give the positive and negative indices (index)(6pts):

B	e	c	a	u	s	e		I	‘	m		h	a	p	p	y
0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1

   b) What is the length of this string (2 pts)?
   17

   c) Give the syntax for the string function that returns the length of `s`, the string. (2 pts)
   len(s)

   d) Give the syntax for the string method that returns a copy of `s` converted to all capital letters. (2 pts)

   s.upper()

   e) Slice the string, `s` to get `'happy'` in 4 ways (4 pts).
   s[12:] s[-5:17]
   s[12:len(s)] s[-5:]
   s[12:17] s[-5:len(s)]

   f) What would `s.find('happy')` return? (2 pts)

   12

   g) What would `s.count('e')` return? (2 pts)

   2

   h) Write the syntax for the **string method** for `s` to change from `"Because I'm happy"` to `"Because I'm joyful"` (5 pts).

   ```
   >>> s.replace('happy', 'joyful')
   'Because I'm joyful'
   ```

2. Briefly define and give an example of each of the following: (10 pts.)

a) method

A function that is associated with an object and called using dot notation. String methods for example s.lower() changes the string s to lowercase letters.

b) Module

A file that contains a collection of related functions. For example Math module has many mathematical functions for use. Another example is the Random module. The modules must be imported.

c) **parameter** (as related to a function)

A name used inside a function to refer to the value passed as an argument. It is named in the function definition. For example in this header, height and base are the parameters. `def area (height, base):`

d) **argument** (as related to a function)

A value provided to a function when the function is called. The value is assigned to the corresponding parameter in the function. For example in this function call 4 and 5 are arguments passed to the function and assigned to height and base respectively `area(4, 5)`

e) immutable data structure

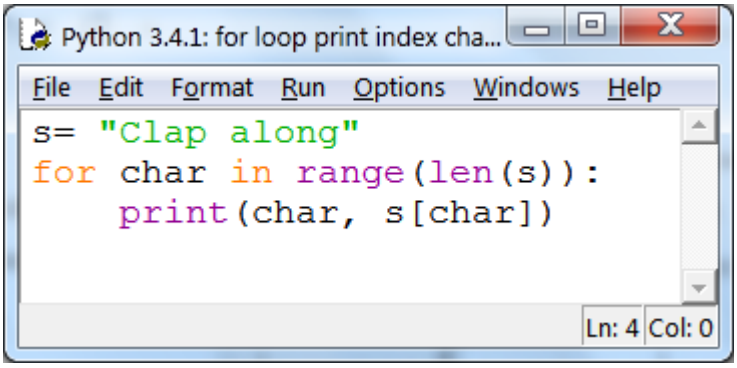
A data structure whose internal data or state cannot be changed. Examples: Strings, floats, ints, tuples

3. Let `data = 'Clap along'`. Write a **`for`** loop to display the characters in the string and their associated position (the character's index). (5 pts.)

Output: Shell

```
>>>
0 C
1 l
2 a
3 p
4
5 a
6 l
7 o
8 n
9 g
>>>
```

```
s= "Clap along"
for char in range(len(s)):
    print(char, s[char])
```



4. Write a **complete Python program** that receives a series of dollar amounts (input without a $) from the user until the user presses the enter key – without a number – to indicate he or she is finished providing inputs. After the user presses the enter key, the program should print the sum of the numbers and average, display with a dollar sign and two places of accuracy. Use a `while` loop. (20 pts.)

Example Shell output: bold numbers are user input

```
>>>
Enter a dollar amount or press Enter to quit: 12.50
Enter a dollar amount or press Enter to quit: 22.32
Enter a dollar amount or press Enter to quit: 1.12
Enter a dollar amount or press Enter to quit: 0.99
Enter a dollar amount or press Enter to quit:
The sum is $36.93 and the average is $9.23
>>>
"""
Program: Test 2 Problem 4 complete Python Program
Computes the sum and average of a series of input dollar amounts.
"""

sum = 0
count = 0
while True:
    number = input("Enter a dollar amount or press Enter to quit: ")
    if number == "":
        break
    else:
        sum += float(number)
        count += 1

if count > 0:
    print("The sum is $%0.2f and the average is $%0.2f" % (sum, (sum /
count)))
```

5. Write a **complete Python function** that returns all of the vowels from a string, call your function collect_vowels, be sure to include a conditional and loop (`for` or `while` and `if`). (20 pts.)

Examples Shell Output: (You do not need to re-write these in the docstring.)

```
>>> collect_vowels("Because I'm happy")
'eaueIay'
>>> collect_vowels("bcd")
''
```

```
def collect_vowels (s):
    '''str -> str
    return the vowels in s. Treat y as a vowel.

    >>> collect_vowels("Because I'm happy")
     'eaueIay'
     >>> collect_vowels("bcd")
     ''
     '''
    vowels = ''
    for char in s:
        if char in 'aeiouyAEIOUY':
            vowels = vowels + char
    return vowels
```

6. Given this **Python program** give the output, line-by-line that would be produced. (10 pts.)

```
count = 0
x = 2
print("start value: count = ", count, "and x = ", x)
while count < 4:
     count = count + 1
     print("count is", count)
     x = x ** (count)
     print("x is", x)
```

Shell	Work Area
>>> start value: count = 0 and x = 2 count is 1 x is 2 count is 2 x is 4 count is 3 x is 64 count is 4 x is 16777216	

7. **Find** and **correct** 5 syntax errors in this Python program. Circle or line through the error and indicate - write the correct syntax. (10 pts.)

```
#This program finds the average length of the words in a sentence
sentence = 'Clap along if you feel like a room without a roof."
     #Quotation marks must match either " and " or ' and '
listOfWords = sentence_split()
     #the string method requires . not _
n = lng(listOfWords)
     #the function is len not lng
print "There are", n, "words."
     #The version of Python we are using requires () with print
sum = 0
for word in listOfWords
     #must have a : colon
    sum += lgn(word)
     #the function is len not lng
print("The average word length is", sum / n)
```

```
#This program finds the average length of the words in a sentence
sentence = 'Clap along if you feel like a room without a roof.'
listOfWords = sentence.split()
n = len(listOfWords)
print ("There are", n, "words.")
sum = 0
for word in listOfWords:
    sum += len(word)
print("The average word length is", sum / n)
```