CSC2-140 Foundations of Computer Science
Exam 2 Part 1 October 18, 2017

solution

name

This exam has 2 parts and this is part 1. This part is worth 60 points. Closed book, closed notes. You may not use any devices while taking this part of the exam.

1.　(2 pts. each) Fill in the blanks.

a. A data type whose values cannot be changed (modifying functions create a totally new object that does not change the original one) is called a(n) ___immutable___ data type.

b. A(n) ___index___ is a variable or value used to select a member of an ordered collection, such as a character from a string, or an element from a list.

c. A function which has no side effects rather it only make changes to the calling program through their return values is called a(n) ___pure___ ___function___.

d. A(n) ___side___ ___effect___ is a change in the state of a program made by calling a function that is not a result of reading the return value from the function.

e. A(n) ___collection___ data type is a data type in which the values are made up of components, or elements, that are themselves values.

f. A(n) ___slice___ is a part of a string (substring) specified by a range of indices.

g. You must ___open___ a file before you can read its contents. When you are done with a file, you should ___close___ it.

2.　(8 pts.) What is the value of each of the following expressions:

a. 'Python'[1]　　y

b. "Strings are sequences of characters."[5]　　g

c. len("wonderful")　　9

d. 'Mystery'[:4]　　Myst

e. 'p' in 'Pineapple'　　True

f. 'pear' not in 'Pineapple'　　True

g. 'apple' > 'pineapple'　　False

h. 'pineapple' < 'Peach'　　False

3. (5 pts.) Write a code segment that will create a list called scores that will contain 1000 random integers.

```
import random
ls = []
for n in range(1000):
    tmp = random.randInt(0, 100)
    ls.append(tmp)
```

4. (5 pts.) Write a code segment that will create a tuple called evens containing all the even integers between 2 and 100 inclusive. *Hint: recall that a tuple holding the integer 5 has to be represented as (5,) rather than just (5).*

```
tup = ()
for i in range(2, 101, 2):
    tup = tup + (i,)
```

5. (2 pts. each) What is printed by the following code segments?

a. fr = {'one':'un', 'two':'deux', 'three':'trois'}
    del fr['one']
    print(len(fr))   2

b. fr = {'one':'un', 'two':'deux', 'three':'trois'}
    print('two' in fr)   True

c. fr = {'one':'un', 'two':'deux', 'three':'trois'}
    print(fr['four'])

    nothing it is an error

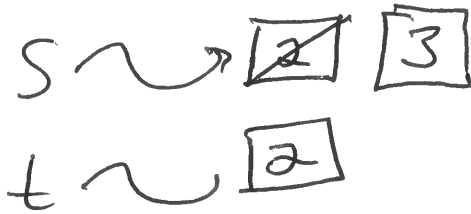6. (8 pts.) Consider the following 2 code segments, similar in structure:

```
#segment 1
s = 2
t = s
s = s + 1
print (t)
```
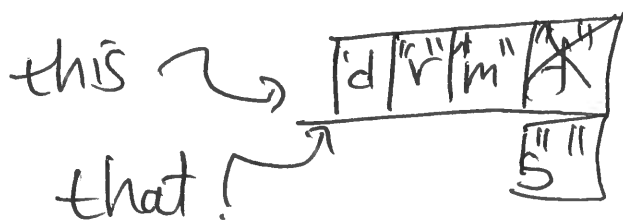
(handwritten reference diagram: s → [2] [3], t → [2])

```
#segment 2
this = ["do", "re", "me", "fa"]
that = this
this[3] = "sol"
print (that)
```

(handwritten reference diagram: this → ["d"|"r"|"m"|"f"], that → , "s")

Produce a reference diagram for each code segment. What will be printed by this code? Explain the difference.

The first code prints a 2, references to s do not change t.
The second prints

7. (3 pts) What will the following code do?

```
this = "Oops that wat a typo"
this[12] = "s"
print(this)
```

Error. Strings are immutable

8. (4 pts.) Consider the following function and function invocation. What is printed? Explain.

```
def change ( myList):
        myList.append('The End')

demo = [1,2,3]
change(demo)
print (demo)
```

[1, 2, 3, 'The End']
The function changes the list by "side effect", "call by reference"

9. (3 pts.) Write a Python statement that would create a dictionary to translate acronyms to their full string. Include these three—GIF is "graphics interchange format", IP is "internet protocol", and RAM is "random access memory".

acr = { "GIF": "graphics interchange format",
        'IP': ("internet protocol",
        'RAM': ('random access memory" }

10. (4 pts.) Give what is printed out by the following code segments
a.
aList= ["Hello","Goodbye"]   Elone
other = aList[:]
print(aList == other)   True
print (aList is other)   False

b.
str = 'Hello'
print(str.find('h'))   -1
print(str.find('o'))   4