Name: \_

Recitation: \_\_\_\_\_ Andrew Id: \_

## 15-112 Summer 2019 Quiz 1

Up to 40 minutes. No calculators, no notes, no books, no computers, no extra paper. Show your work! Do not use lists, sets, dictionaries, or recursion on this quiz.

1. (35 points) Free Response: isCountish and nthCountish. A number is considered "countish" (a coined term) if it contains zero 0's (not counting leading 0's), one 1, two 2's, etc., up until the largest digit in the number. So, for example, 312233 is countish, but 3122332 is not (it has an extra 2). We do not consider 0 to be a countish number.

With this is mind, write the function the function isCountish(n) that takes a possibly negative integer n and returns True if n is "countish", and False otherwise. Also, write the function nthCountish(n) that returns the nth "countish" number. nthCountish(0) should return 1.

Note: You cannot use strings in this problem. Any solution that uses strings will recieve no credit.

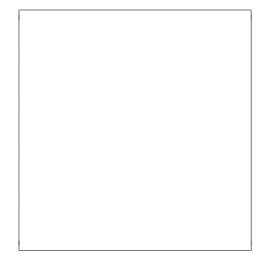
2. (25 points) Free Response: Write the function snazziestWord(message, letterPoints) that takes in a message, a space-separated string of words, and returns the "snazziest" word within the message as defined by letterPoints. letterPoints is a string where each character occurs a maximum of once, and a character's index in the string represents the number of "snazzy" points it should be awarded (starting at 1). The "snazzy score" of a word is the sum of all the points of each character in that word.

For example, if letterPoints = "abc", then "a" has 1 point, "b" has 2 points, and "c" has 3 points. Any character not in letterPoints should be awarded 0 points. So, using letterPoints = "abc", the word "cat" is worth 4 snazzy points ("c" has 3 points, "a" has 1 point, and "t" has 0 points).

For example, if message = "one small step for man", and letterPoints = "aml", then snazziestWord should return "small", since "small" is the highest scoring word, with a score of 0+2+1+3+3 = 9.

- 3. (5 points) Short Answer
  - (a) Name 2 distinct course resources you can use if you are struggling with one or more of the HW problems.
  - (b) Say there is a Python program that contains a runtime error, a syntax error, and a logical error. Which one will Python report first when you run the program?
  - (c) Write a Python expression that uses short-circuit evaluation.
  - (d) What is the length of the following string: "ab\t?1\n\\"?
  - (e) What does the following expression evaluate to: "TA's are superheros!!".find("a")

4. (10 points) **Code Tracing:** Indicate what the following program prints. Place your answer (and nothing else) in the box to the right of the code.



5. (10 points) **Code Tracing:** Indicate what the following program prints. Place your answer (and nothing else) in the box to the right of the code.

**Note:** you don't need to know the actual values for the ord of a character for this problem! You can (and should) solve this problem without needing to use those values.

```
def f(a):
   res = ""
    for c in a:
       res += chr(ord(c) + 2)
    return res
def ct2(a, b):
    result = 0
    while len(a) > 0:
        if a.isupper():
            print(f(a))
        else:
            print(a)
            result += b.count(a[0])
        a = a[-2:0:-1]
    return result
print(ct2("abCDEFgh", "yang gang"))
```

6. (15 points) **Reasoning Over Code**: Find an input value for s that makes roc(s) return True. Place your answer (and nothing else) in the box to the right of the code. Assume that the function isPrime exists and works as presented earlier in the course.

```
def f(s):
    a = 0
    for c in s:
        a += (ord(c) - ord('c'))
    return a // len(s)
def roc(s):
    assert(len(s) == 6)
    a = f(s)
    b = f(s[::2])
    return isPrime(a) and isPrime(b) and a != b
```

