Name:_____ Section:____ AndrewID:_____

15-112 Fall 2021 Quiz 2a

*** Up to 20 minutes. * No calculators, no notes, no books, no computers. * Show your work!**

*** No strings, lists, string or list indexing, or recursion**

Code Tracing 1 [20pts]: Indicate what the following code prints. Place your answers (and nothing else) in the box to the right of the code.

```
def ct1(m):
    x = 1
    while x < 6:
        if x >= 5:
            break
        x += 2
        print(f'x = {x}')
    for y in range(m, m+2):
        print(f'y = {y}')
        x += y
    return x
print(ct1(2))
```

Code Tracing 2 [20pts]: Indicate what the following code prints. Place your answers (and nothing else) in the box to the right of the code.

```
def ct2(x, y):
    for i in range(x):
        if i < 2:
            print("yay")
        for j in range(i, y):
            if (i + j) % 3 == 0:
                print(i, j)
print(ct2(3, 5))
```

Free Response 1: countPalNumbers(n) [60 pts]

Write the function countPalNumbers(n), which takes a positive integer n and returns the number of palindrome numbers (pal for short) that exist between 1 and n (inclusive). A palindrome number is an int that is the same forwards as backwards; for example, 121 is a palindrome number, as is 7. 1231 is not a palindrome number, as it is not equal to 1321. countPalNumbers(10) would return 9, as all single-digit numbers are palindromes; countPalNumbers(44) would return 13, as 11, 22, 33, and 44 are also palindromes.

Note: you may not use strings in this problem!! A solution that uses strings will receive 0 points.

```
assert(countPalNumbers(1)==1) #Just 1
assert(countPalNumbers(5)==5) # 1, 2, 3, 4, 5
assert(countPalNumbers(10)==9) # all 9 non-zero digits
assert(countPalNumbers(50)==13) # 9 non-zero digits, 11, 22, 33, 44
assert(countPalNumbers(1000)==108) # should work for any positive int
```

Bonus/Optional: Code Tracing [+2.5pts]

Indicate what this prints. Place your answer (and nothing else) in the box.

```
def bonusCt(n):
    (a,b,c) = (0, 1000, 100)
    while (c < 1000):
        for x in range(a, b, c):
            (a,b,c) = (a+1, b-1, c+50)
    return a-n
print(bonusCt(2))
```