

15-112 Spring 2020 Quiz 3

Up to 20 minutes. No calculators, no notes, no books, no computers. Show your work!
Do not use string indexing, loops, lists, dictionaries, try/except, or recursion on this quiz.

1. **Code Tracing:** Indicate what the following two programs print. Place your answers (and nothing else) in the boxes next to the code.

(a) (2 points) CT1

```
def a(x):
    print("Cat")
    return (x//5)%4

def b(x):
    print("Dog")
    return x+4/2

def ct1(x):
    myVar = a(x)
    print(b(x))
    print(myVar)

ct1(50)
```

(b) (2 points) CT2

```
def ct2():
    a = [1,3,8,4,0]
    b = [2,0,1]
    i = 0
    for x in [4,1,2]:
        print(x,b[i])
        print(a[x-b[i]])
        i = i + 1

ct2()
```

2. (2 points) **Reasoning Over Code:** Find an argument, `b`, for the following function to cause it to return `True`. Place your answer (and nothing else) in the box below the code. Hint: `b` should be a list of numbers.

```
def foo(b):
    sum = 0
    for i in b:
        if i == 3:
            sum = sum + i
        else:
            sum = sum - i
    return len(b) == 7 and sum == 17
```

3. (4 points) **Free Response:** Write the function `distance(n)` which, given a non-negative integer `n` that encodes two points, returns the distance between those two points. You should assume that each point consists of a pair of two-digit numbers.

For example...

- `distance(10011305)` returns the distance between points (10,1) and (13,5), which is 5.
- `distance(20003000)` returns the distance between points (20,0) and (30,0), which is 10.
- `distance(101)` returns the distance between points (0,0) and (1,1), which is 1.4142135623730951.