

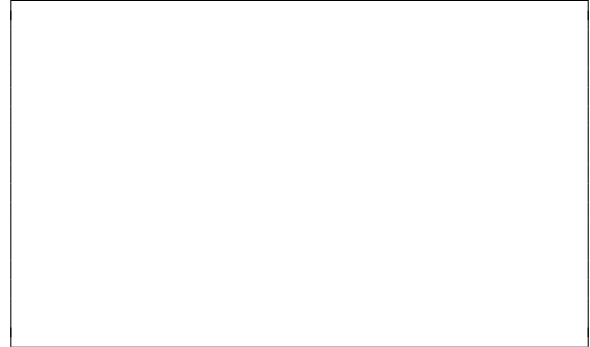
Name: _____ Andrew Id: _____

15-112 Spring 2023 Quiz 3

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

1. (8 points) **Code Tracing:** Indicate what the following program prints. Place your answer (and nothing else) in the box next to the code.

```
def f(x):  
    print(x)  
    return 42  
  
def ct(x):  
    counter = 0  
    target = x  
    for i in range(5, -1, -2):  
        if counter == target:  
            print("meet", counter)  
            target += 1  
        else:  
            print("miss", target)  
            counter += 2  
    return f(counter)  
  
ct(2) # starts here
```



2. (4 points) **Reasoning Over Code:** Find an argument, `n`, for the following function to cause it to return `True`. Place your answer (and nothing else) in the box below the code.

```
def roc(n):  
    if not isinstance(n, int) or n < 0 or n > 65:  
        return False  
    x = 1  
    while x <= 15:  
        n = n // x  
        x *= 2  
    return n == 1
```

3. (8 points) **Free Response:**

Write the function `longest42Run(n)`, that takes a positive integer `n` and returns the length of the longest run of the number of **42** within `n`'s digits.

Note: the definition of *run* is the same as the one given in the homework problem `longestDigitRun`, but this time applied to the two-digit sequence **42**.

For example...

- `longest42run(424200)` returns 2 because there are two **42** in sequence: $\underbrace{4242}_{2}00$
- `longest42run(42)` returns 1 because there is only one **42**: $\underbrace{42}_{1}$
- `longest42run(421142)` also returns 1 because not two consecutive **42**s appear in sequence: $:\underbrace{42}_{1}11\underbrace{42}_{1}$
- `longest42run(15112)` returns 0 because there is no **42** within the digits.
- `longest42run(142424242424200)` returns 6: $1\underbrace{4242424242}_{6}00$
- `longest42run(142424242004242)` returns 4: there are two runs of **42** of length 4 and 2, so you must return the longest: $1\underbrace{42424242}_{4}00\underbrace{4242}_{2}$

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