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15-112 Spring 2021 Quiz 03

20 minutes. Do not use string indexing, loops, lists, dictionaries, try/except, or recursion on this quiz.

1. Code Tracing (Part 1) [4 pts] Indicate what the following program prints. (Hint: There are five lines of output.) **Put a box around your final answer.**

```
def fa(x, y, z):
    print("fa", x, y, z)
    return x*y+z
```

```
def fb(x, y, z):
    print("fb", x, y, z)
    z += 1
    a = fa(z,x,y)
    print(a)
    return a // (z+x+y)
```

```
def ct1():
    x = 5
    y = 6
    z = 7
    print(fb(x,y,z))
    print("ct1", x, y, z)
```

ct1()

2. Code Tracing (Part 2) [4 pts] Indicate what the following program prints. **Put a box around your final answer.**

```
def fc(x, y):
    return x/y == x//y
```

```
def fd(c, d):
    return c - d * 2
```

```
def ct2():
    for a in range(1,6):
        print(fc(10,a))
        print(fd(a,3))
```

ct2()

3. Reasoning Over Code [4 pts] For the following function, find a pair of int values (x,y) roc(x,y) will return True. **Put a box around your final answer.**

```
def roc(x, y):
    z = 10+x*y
    return (100>x>y>0) and (x-y<10) and math.isclose(z%(z-5),z**0.5)
```

4. Free Response – Doha Hour [8 pts] Write the function `dohaHour(londonHour)` that takes a non-negative integer, the current hour in London, and returns as an integer the current hour in Doha (which is 3 hours ahead of London). However, London time is given in 24-hour time (so `londonHour` is between 0 and 23, inclusive), but Doha time must be returned in 12-hour time (so the result must be between 1 and 12, inclusive, where “am” and “pm” are ignored). If the `londonHour` provided is invalid, then return `None`.

See the test cases in the code below for some examples:

```
def testdohaHour():
    print("Testing dohaHour()...", end="")
        # London      Doha
    assert(dohaHour( 0) == 3) # midnight 3am
    assert(dohaHour( 5) == 8) # 5am      8am
    assert(dohaHour(10) == 1) # 10am     1pm
    assert(dohaHour(12) == 3) # noon     3pm
    assert(dohaHour(17) == 8) # 5pm     8pm
    assert(dohaHour(21) == 12) # 9pm    12am
    assert(dohaHour(24) == None)
    print("Passed.")
```