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15-112 Spring 2019 Quiz 1

Up to 15 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) (20 points) CT1

```
def a(x):
    print("A")
    return x%2==0
def b(x):
    print("B")
    return x//5 == x/5
def ct1(x):
    print(a(x))
    print(b(x))
    if a(x) and b(x):
        return True
    else:
        return False

print(ct1(7))
print(ct1(10))
```

   (b) (20 points) CT2

```
import math
def p(x): # print and return x
    print(x)
    return x
def g(x):
    return p(int(x-x/2))
def h(x):
    return p(math.ceil(x-x/2))
def ct2(x, y, z):
    return p(z+y**x)

print(ct2(g(5), g(8), h(5)))
```

2. (20 points) **Reasoning Over Code**: Find an argument (the value of n) for the following function that makes it return True. Place your answer (and nothing else) in the box below the code:

```
def rc1(n):
    a = (n//1000)%10
    b = n%10
    c = (n//10)%100
    return (a == b+1) and (c == a + b) and (c > 9) and  (n > 6000) and (n < 7000)
```

3. (40 points) **Free Response**: Write the function `pairedNumber(n)` that returns True if the six digit number n contains a matching set of three, two digit numbers in order, and False otherwise. For example...
`pairedNumber(121212)` returns True (the three, two digit numbers are 12, 12, and 12)
`pairedNumber(121312)` returns False (one of the two digit numbers is 13)
`pairedNumber(1212)` returns False (there are only two, two digit numbers)
`pairedNumber(565656)` returns True
`pairedNumber(555)` returns False