Quiz 4

Name: ________________________________

Question 1 (20 points). Each of the following Python programs prints "Hello" some number of times. For each program, indicate the number of times it prints "Hello" and then briefly justify your answer. Hint: try working out how the program runs by writing a stack diagram on a piece of scrap paper.

(a).

```python
1 def printHello(n):
2     for i in range(n):
3         print "Hello"
4 printHello(3)
5 printHello(2)
6 printHello(0)
```

(b).

```python
1 def maybePrintHello(n):
2     if n % 2 == 0:
3         print "Hello"
4         n+=1
5 x=0
6 maybePrintHello(x)
7 maybePrintHello(x)
```

Question 2 (30 points). Write a function called find_multiple. This function should take two arguments: lst, a list of integers; and n, an integer. This function should return the position of the first element in the list lst which is evenly divisible by n. If no such element exists, this function should return None.
Question 3 (40 points). Consider the following program; then, answer the questions below. You must answer at least five parts of this question correctly to receive full credit.

```python
def fib(lst, how_many):
    while len(lst) < how_many:
        second_to_last = len(lst)-2
        last = len(lst)-1
        # scope question here
        lst.append(lst[second_to_last] + lst[last])
    # stack trace question here
    return lst

def main():
data1 = ["a", "b"]
fib(data1, 5) # first call
print data1
data2 = [0, 1]
fib(data2, 5) # second call
print data2
main()
```

(a). What type of data is stored in the variable second_to_last?

(b). Which variables are in scope on line 5?

(c). Draw a stack diagram of the program the first time it reaches line 7.

(d). What are the elements of the list printed on line 12?

(e). What are the elements of the list printed on line 15?

(f). The variable data1 in main does not change after line 10. Why doesn’t line 12 print ["a", "b"]?

Question 4 (10 points). The following function was intended to convert a list of strings to a new list of integers, putting None in the place of any string which cannot be converted. For instance, int_list(['4', 'apple', '80']) should return [4, None, 80]. It does not do this. Explain what it does instead and then describe how to fix it.

```python
def int_list(str_list):
    accumulator = []
    try:
        for the_string in str_list:
            accumulator.append(int(the_string))
    except ValueError:
        accumulator.append(None)
    return accumulator
```