CIS 210 Winter 2017 More Midterm 1 Practice Questions

(1) The Taylor series expansion for $e^x$ has the following form:

$$e^x = \sum_{n=0}^{\infty} \frac{x^n}{n!}$$

If we truncate the sum after $N$ terms, we have an approximation for $e^x$ as:

$$e^x \approx \sum_{n=0}^{N-1} \frac{x^n}{n!}$$

Complete the docstring for function `approx_exp()` below, consistent with this approximation for $e^x$.

```python
from math import factorial  # factorial(n) returns n!

def approx_exp(x, terms):
    '''docstring goes here'''

    >>> approx_exp(1, 100)
    2.7182818284590455
    ...

    acc = 0
    x_to_power = 1
    for n in range(terms):
        acc += x_to_power/factorial(n)
        x_to_power *= x
    return acc
```
(2)(a) Complete the docstring for function `periscope`.

(2)(b) What is the result of executing `>>> q2()`?

```python
def periscope(x, y):
    '''(int, int) -> int

    ...'
    x = 2 * x
    y = 2 * y
    return x - y

def q2():
    '''() -> None
    What does this function do?
    ...'
    x = 7
    y = 5
    z = periscope(x, y)
    print(x + y + z)
    return None
```
(3)(a) Complete the docstring for function q3.

(3)(b) What is the result of executing `>>> q3('abcccfdef')`?

```python
def q3(s):
    '''(str) -> int

Finish this docstring.

...'''

    if len(s) != 0:
        prev_char = s[0]
        dup_ct = 1
        high_ct = 1
    else:
        high_ct = 0

    for i in range(1, len(s)):
        if s[i] == prev_char:
            dup_ct += 1

        else:
            prev_char = s[i]

    if dup_ct > high_ct:
        high_ct = dup_ct
        dup_ct = 1

    return high_ct
```

(4)(a) Complete the docstring for function $q_4$.

(4)(b) What is the result of executing $\gg\gg\gg q_4('CIS 210')$?

```python
def q3(astring):
    """(str) -> Boolean

    Finish this docstring.
    """

digits_ctr = 0

    for c in astring:
        if c.isdigit():
            digits_ctr += 1

    return (digits_ctr >= 2)
```

(5) Add the missing line of code:

```python
total = 0
anum = 1
while anum <= 10:
    total += anum
print(total)
```