(0) Create a string variable, name, that is assigned to your name:

(1) What is the result of executing `>>> q1(90)`?

```python
def q1(score):
    ''' No docstring on the exam '''
    gradepoint = 0

    if score >= 90:
        gradepoint = 4

    if score >= 80:
        gradepoint = 3

    if score >= 70:
        gradepoint = 2

    if score >= 60:
        gradepoint = 1

    return gradepoint
```
(2) Replace the ?? with the results of executing the following code in the Python Shell (indicate 'error' if the result would be a Python error message)

```python
>>> x = 210
>>> y = '210'
>>> len(x)
??
>>> len(y)
??
>>> x / 3
??
>>> y / 3
??
>>> x = y
>>> y = '211'
>>> x + '_212'
??
>>> y + '_212'
??
```

(3) Replace ?? (2 places) with the expected results:

```python
def twice(x):
    
    result = 2 * x
    print(result)
    return None

>>> x = 99
>>> twice(10)
??
>>> x
??
```
(4) An approximation for the square root of \( n \) can be generated using the following equation:

\[
x_{k+1} = \frac{1}{2} \left( x_k + \frac{n}{x_k} \right), \text{where } x_0 = 1
\]

Each value of \( x \) should be a better approximation for the square root of \( n \).

(a) Supply the type contract for function `approx_sqrt` below, consistent with this equation.

(b) Replace the `??` (2 places) with the code needed to implement the approximation.

```python
def approx_sqrt(num, iterations):
    '''TYPE CONTRACT GOES HERE

    Generates an approximate square root of num, a positive number, via an iterative process that runs iterations times. The approximate square root is returned.
    
    >>> approx_sqrt(1, 1)
    1.0
    >>> approx_sqrt(4, 1)
    2.5
    >>> approx_sqrt(4, 5)
    2.000000000000002
    
    value = ??
    for ctr in range(??):
        value = .5 * (value + num/value)
    
    return value
```
(5) Mark the code below to show the (6) changes that would be needed to revise `isInCircle` to check whether point \((x, y)\) were inside a circle with a radius of any length. (Don't forget the docstring!)

```python
import math
def isInCircle(x, y):
    '''(number, number) -> Boolean

    Returns True if point \((x, y)\) is in the circle with radius 1.

    >>> isInCircle(.5, .5)
    True
    >>> isInCircle(1, 2)
    False
    '''
    d = math.sqrt(x**2 + y**2)
    return (d <= 1)
```

(6) (a) The following code does not execute as expected. Add the missing code:

```python
total = 0
astr = 'a b c d e f'
i = 0
while i < len(astr):
    if astr[i] == ' ':
        total += 1
print(total)
```

(6) (b) Rewrite the while loop as a for loop:
(7)(a) Complete the docstring for function q7.
(7)(b) What is the result of executing `q7('hello')`?

```python
def q7(myStr):
    '''(str) -> str
    FINISH THIS DOCSTRING
    ...
    newStr = ''
    for nextCh in myStr:
        if nextCh not in newStr:
            newStr += nextCh
    return newStr
```

(8) What is the result of executing `q8(7, 2)`?

```python
def q8(w, z):
    '''(int, int) -> None
    Exam function type contract only.
    ...
    while z < w :
        w += 1
        z += 2
    print(w, z, z - w)
    return None
```