

UNOFFICIAL QUIZ *for* PRACTICE

QUIZ 2

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This quiz will not count towards your grade. It exists to simply gauge your understanding. You will have 5 minutes to complete this quiz. In that timespan, your goal is to complete one question and at least attempt the other two.

01. ENVIRONMENT DIAGRAMS

What does the following code return when you run `piece('BATMAN!')`? (**Hint:** Use an environment diagram)

```
x = y = 0
name = 'NaN'

def piece(name):
    """Mysterious function"""
    x = y = 5
    def move(f, dx, dy):
        if dx % 3 == 0:
            return f(move, dx-2, dy-2)
        return f(fly, x-1, y-1)
    return move(move, 7, 7) + name

def fly(f, x, y):
    """Take note that multiplying a
    string s by integer x will repeat
    a string s x times.
    >>> 'yo' * 2
    'yoyo'
    """
    if x*y < 5:
        return name * (x+y)
    return f(fly, x-1, y-1)
```

NaNNaNNaNNBATMAN! # prints NaN four times
environment diagram: <http://goo.gl/6nPWY7>

UNOFFICIAL QUIZ *for* PRACTICE**02. RECURSION**

Implement the new and improved hailstone function below. You may wish to write this on a separate sheet of paper.

```
def hailstone_repeater(k):
    """
    Print each number n in the hailstone sequence n+k times. Remember
    that for every iteration in hailstone:
        - if the number n is even, divide n by 2.
        - if n is odd, multiply by 3 and add 1.
    Return the total number of iterations, including repeats.
    >>> hailstone = hailstone_repeater(1) # k = 1
    >>> a = hailstone(2) # first iter: n + k = 2 + 1 = 3 times print(2)
    2
    2
    2
    1
    1
    >>> a # 5 items were printed, total (including repeats)
    5
    """

    def printh(n, i):
        print(n)
        if i == 1:
            return 1
        return 1 + printh(n, i-1)

    def hailstone(n):
        increment = printh(n, n+k)
        if n == 1:
            return increment
        elif n % 2 == 0:
            return increment + hailstone(n // 2)
        else:
            return increment + hailstone(3 * n + 1)

    return hailstone
```

UNOFFICIAL QUIZ *for* PRACTICE**03. BOOLEAN OPERATORS**

Complete the following one-line function that satisfies the function doctests.

```
def default(x):
    """Default returns a function that accepts an argument y and:
    - if y is True, return x + 1
    - if y is an integer or a stringified integer, return x + y
    - if y is False or falsey, return x - 1
    Assume that default will not receive non-integer strings. Without
    using if's, fill in the following.
    >>> f = default(5)
    >>> f(True)
    6
    >>> f('10')
    15
    >>> f(0)
    4
    """
    return lambda y: int(y or -1) + 1
```