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"""Lecture 5 Examples: More higher-order functions."""
from ucb import main, interact

# Review

from operator import floordiv, mod

def divide_exact(n, d):
    """Return the quotient and remainder of dividing n by d."""
    return floordiv(n, d), mod(n, d)

def cube(k):
    return pow(k, 3)

def summation(n, term):
    """Sum the first n terms of a sequence.

    >>> summation(5, cube)
    225
    """
    total, k = 0, 1
    while k <= n:
        total, k = total + term(k), k + 1
    return total

def make_adder(n):
    """Return a function that takes one argument k and returns k + n.

    >>> add_three = make_adder(3)
    >>> add_three(4)
    7
    """
    def adder(k):
        return k + n
    return adder

# Composition

def compose1(f, g):
    """Return a function that composes f and g.

    f, g -- functions of a single argument
    """
    def h(x):
        return f(g(x))
    return h

def square(x):
    return x * x

def triple(x):
    return 3 * x

squiple = compose1(square, triple)
tripare = compose1(triple, square)

@main
def run():
    interact()
```