

Guerrilla Section 1: Functions, Control, Environment Diagrams

Solutions

Instructions

Form a group of 3-4. Start on Question 0. Check off with a staff member when everyone in your group understands how to solve the questions up to the first checkpoint. Repeat for the second checkpoint, the third checkpoint, and so on. **You're not allowed to move on after a checkpoint until you check off with a staff member.** You are allowed to use any and all resources at your disposal, including the interpreter, lecture notes and slides, discussion notes, and labs. You may consult the staff members, **but only after you have asked everyone else in your group.** The purpose of this section is to have all the students working together to learn the material.

Functions

Question 0:

What will Python output?

```
>>> from operator import add, mul
>>> mul(add(5, 6), 8)
88
>>> print('x')
x
>>> y = print('x')
x
>>> print(y)
None
>>> print(add(4, 2), print('a'))
a
6 None
```

Question 1: Raising the Bar

What will Python output?

```
>>> def foo(x):  
...     print(x)  
...     return x + 1
```

```
>>> def bar(y, x):  
...     print(x - y)
```

```
>>> foo(3)  
3  
4  
>>> bar(3)  
Error  
>>> bar(6, 1)  
-5  
>>> bar(foo(10), 11)  
10  
0
```

STOP!

Don't proceed until everyone in your group has finished and understands all exercises in this section, and you have gotten checked off!

Control

Question 2: Control yourself

- a) Which numbers (1-4) will be printed after executing the following code?

```
n = 0
if n:
    print(1)
elif n < 2:
    print(2)
else:
    print(3)
print(4)
```

2 and 4

- a) WWPD (What would Python Display) after evaluating each of the following expressions?

```
>>> 0 and 1 / 0
```

0

```
>>> 6 or 1 or "a" or 1 / 0
```

6

```
>>> 6 and 1 and "a" and 1 / 0
```

Error

```
>>> print(print(4) and 2)
```

4

None

```
>>> not True and print("a")
```

False

Question 3: You have control

- a) Define a function, `count_digits`, which takes in a positive integer, `n`, and counts the number of digits in that number.

```
def count_digits(n):  
    """  
    >>> count_digits(4)  
    1  
    >>> count_digits(12345678)  
    8  
    >>> count_digits(3)  
    1  
    """  
    count = 0  
    while n > 0:  
        count += 1  
        n = n // 10  
    return count
```

- b) Define a function, `count_matches`, which takes in two positive integers `n` and `m`, and counts the number of digits that match.

```
def count_matches(n, m):  
    """  
    >>> count_matches(10, 30)  
    1  
    >>> count_matches(12345, 23456)  
    0  
    >>> count_matches(121212, 123123)  
    4  
    >>> count_matches(111, 11) # only one's place matches  
    2  
    >>> count_matches(101, 10) # no place matches  
    0  
    """  
  
    matches = 0  
    while n > 0 and m > 0:  
        if n % 10 == m % 10:  
            matches += 1  
        n, m = n // 10, m // 10  
    return matches
```

STOP!

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Environment Diagrams

Question 4: A New Environment

- a) Draw the environment diagram for evaluating the following code

```
def f(x):  
    return y + x
```

```
y = 10  
f(8)
```

Solution: <https://goo.gl/rZnzaM>

- b) Draw the environment diagram for evaluating the following code

```
def dessef(a, b):  
    c = a + b  
    b = b + 1
```

```
b = 6  
dessef(b, 4)
```

Solution: <https://goo.gl/4m3NRD>

STOP!

Don't proceed until everyone in your group has finished and understands all exercises in this section, and you have gotten checked off!

Question 5:

- a) Draw an environment diagram for the following code

```
def foo(x, y):  
    foo = bar  
    return foo(bar(x, x), y)
```

```
def bar(z, x):  
    return z + y
```

```
y = 5  
foo(1, 2)
```

<https://goo.gl/7Kcx6n>

- b) Draw an environment diagram for the following code

```
def spain(japan, iran):  
    def world(cup, egypt):  
        return japan-poland  
    return iran(world(iran, poland))
```

```
def saudi(arabia):  
    return japan + 3  
japan, poland = 3, 7
```

```
spain(poland+1, saudi)
```

<https://goo.gl/iddW49>

c) Draw an environment diagram for the following code

```
cap = 9  
hulk = 3
```

```
def marvel(cap, thor, marvel):  
    iron = hulk + cap  
    if thor > cap:  
        def marvel(cap, thor, avengers):  
            return iron  
    else:  
        iron = hulk  
    return marvel(thor, cap, marvel)
```

```
def iron(man):  
    hulk = cap - 1  
    return hulk
```

```
marvel(cap, iron(3), marvel)
```

<https://goo.gl/sofcq2>

CONGRATULATIONS!

You made it to the end of the worksheet! Great work :)