## **CONTROL & ENVIRONMENTS**

## CS 61A GROUP MENTORING

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**1** Environment Diagrams

1. When do we make a new frame in an environment diagram?

2. Draw the environment diagram that results from running the following code.

```
def swap(x, y):
    x, y = y, x
    return print("Swapped!", x, y)
x, y = 60, 1
a = swap(x, y)
swap(a, y)
```

```
3. Draw the environment diagram that results from running the following code.
def funny(joke):
    hoax = joke + 1
    return funny(hoax)
def sad(joke):
    hoax = joke - 1
    return hoax + hoax
funny, sad = sad, funny
result = funny(sad(1))
```

4. Draw the environment diagram that results from running the following code.

```
a = 1
c = 2
def b(b):
    def d():
        return b + c
        return d()
c = b(a)
a = b(c)
```

1. Write a function that returns true if a number is divisible by 4 and false otherwise.

2. Write a function, is\_leap\_year, that returns true if a number is a leap year and false otherwise. Recall that a *leap year* is divisible by 4 unless the year is not divisible by 400.

3. Implement fizzbuzz (n), which prints numbers from 1 to n (inclusive). However, for numbers divisible by 3, print "fizz". For numbers divisible by 5, print "buzz". For numbers divisible by both 3 and 5, print "fizzbuzz".

```
def fizzbuzz(n):
    .....
    >>> result = fizzbuzz(16)
    1
    2
    fizz
    4
    buzz
    fizz
    7
    8
    fizz
    buzz
    11
    fizz
    13
    14
    fizzbuzz
    16
    >>> result is None
    True
    .....
```