

# What gets printed, Round 1

---

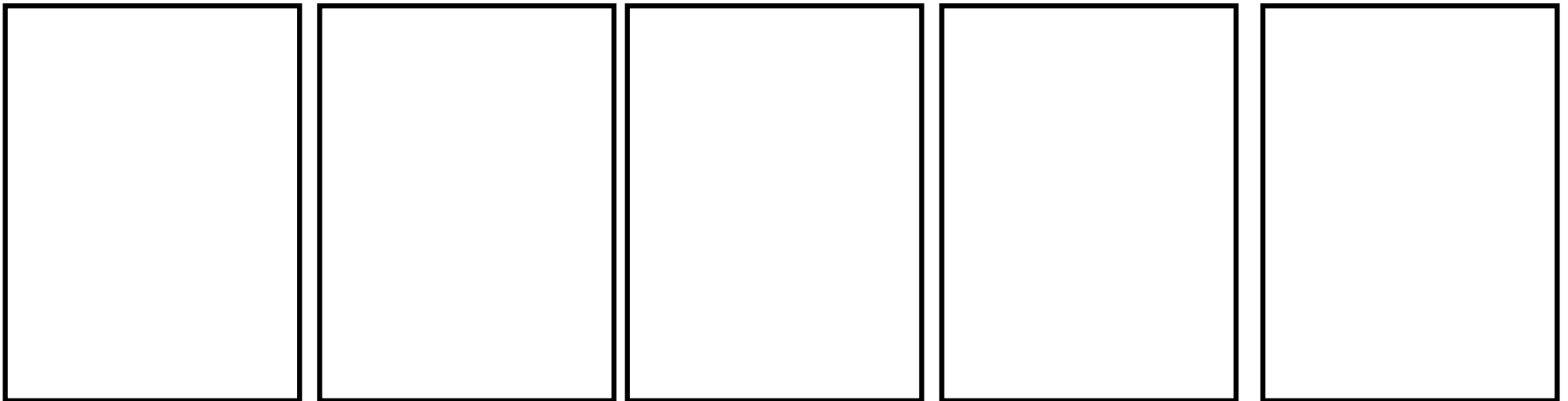
```
a = 0  
print(a)
```

```
a = 0  
a = a + 1  
print(a)
```

```
a = 0  
if a == 0:  
    a = a + 1  
print(a)
```

```
a = 0  
if a == 1:  
    a = a + 1  
print(a)
```

```
a = 0  
if a == 0:  
    a = a + 1  
a = a + 1  
print(a)
```



*(Let's look at these one by one.)*

# What gets printed, Round 1, Solutions

---

```
a = 0  
print(a)
```

```
a = 0  
a = a + 1  
print(a)
```

```
a = 0  
if a == 0:  
    a = a + 1  
print(a)
```

```
a = 0  
if a == 1:  
    a = a + 1  
print(a)
```

```
a = 0  
if a == 0:  
    a = a + 1  
a = a + 1  
print(a)
```

0

1

1

0

2

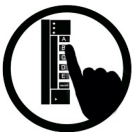
# What gets printed? (Question)

---

```
a = 0
if a == 0:
    a = a + 1
if a == 0:
    a = a + 2
a = a + 1

print(a)
```

- A: 0
- B: 1
- C: 2
- D: 3
- E: I do not know



# What gets printed? (Solution)

```
a = 0
```

Executed

```
if a == 0:
```

Executed

```
    a = a + 1
```

Executed

```
if a == 0:
```

Executed

```
    a = a + 2
```

Skipped

```
a = a + 1
```

Executed

```
print(a)
```

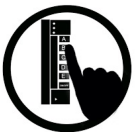
A: 0

B: 1

C: 2 CORRECT

D: 3

E: I do not know



# What gets printed, Round 2

---

```
a = 0
if a == 0:
    a = a + 1
else:
    a = a + 2
print(a)
```

```
a = 0
if a == 1:
    a = a + 1
else:
    a = a + 2
print(a)
```

```
a = 0
if a == 1:
    a = a + 1
else:
    a = a + 2
a = a + 1
print(a)
```

```
a = 0
if a == 1:
    a = a + 1
else:
    a = a + 1
a = a + 1
print(a)
```

*(Let's look at these one by one.)*



# What gets printed, Round 2

---

```
a = 0
if a == 0:
    a = a + 1
else:
    a = a + 2
print(a)
```

```
a = 0
if a == 1:
    a = a + 1
else:
    a = a + 2
print(a)
```

```
a = 0
if a == 1:
    a = a + 1
else:
    a = a + 2
a = a + 1
print(a)
```

```
a = 0
if a == 1:
    a = a + 1
else:
    a = a + 1
a = a + 1
print(a)
```

1

2

3

3

# What does the call frame look like next? (Q)

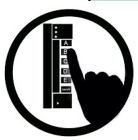
```

def max(x,y):
1  if x > y:
2      return x
3  return y
    
```

max(0, 3)

Current call frame:

max	1
x	0
y	3



A:

max	<del>1</del> 2
x	0
y	3

B:

max	<del>1</del> <del>2</del> <del>3</del>
x	0
y	3
RETURN	0

C:

max	<del>1</del> <del>2</del> <del>3</del>
x	0
y	3
RETURN	3

D:

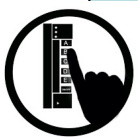
max	<del>1</del> 3
x	0
y	3

# What does the call frame look like next? (A)

```
def max(x,y):  
1  if x > y:  
2      return x  
3  return y
```

max(0, 3)  
Current call frame:

max	1
x	0
y	3



A:

max	<del>1</del> 2
x	0
y	3

B:

max	<del>1</del> <del>2</del> <del>3</del>
x	0
y	3
RETURN	0

C:

max	<del>1</del> <del>2</del> <del>3</del>
x	0
y	3
RETURN	3

D:

max	<del>1</del> 3
x	0
y	3
✓	



# Call Frame Explanation (1)

---

```
def max(x,y):  
1  if x > y:  
2      return x  
3  return y
```

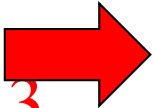
max(0, 3):

max		1
x	0	
y	3	

# Call Frame Explanation (2)

---

```
def max(x,y):  
1   if x > y:  
2       return x  
3   return y
```



max(0, 3):

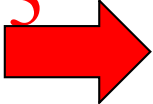
max		<del>1</del> 3
x	0	
y	3	

Skips line 2

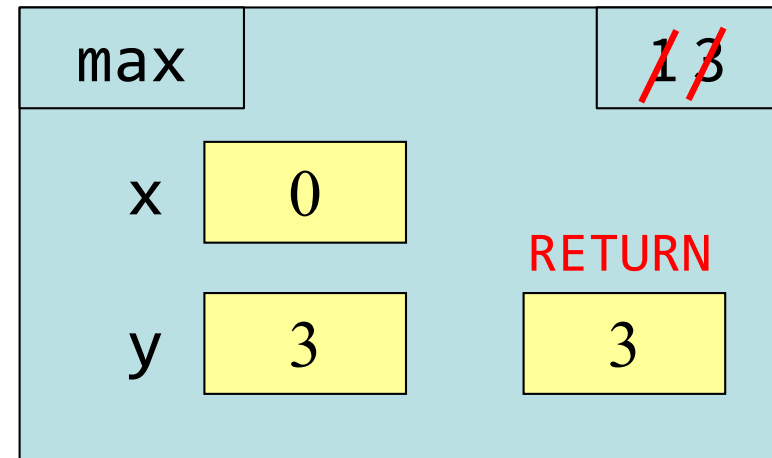
# Call Frame Explanation (3)

---

```
def max(x,y):  
1   if x > y:  
2       return x  
3   return y
```



max(0, 3):



# What gets printed, Round 3

---

```
a = 0
```

```
if a == 0:
```

```
    b = 0
```

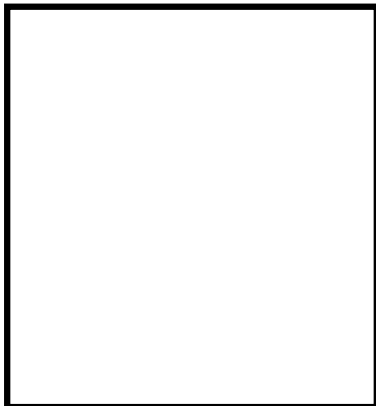
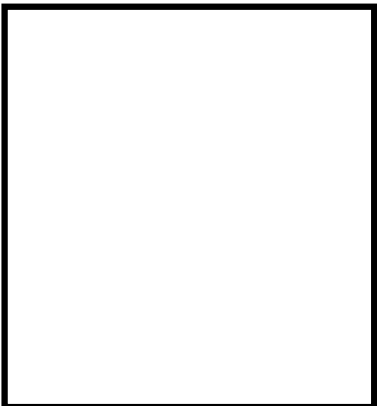
```
print(b)
```

```
a = 1
```

```
if a == 0:
```

```
    b = 0
```

```
print(b)
```



# What gets printed, Round 3, Solution

---

```
a = 0
```

```
if a == 0:
```

```
    b = 0
```

```
print(b)
```

```
a = 1
```

```
if a == 0:
```

```
    b = 0
```

```
print(b)
```

0

Error!

# Control Flow and Variables (Q1)

---

```
def max(x,y):  
    """Returns: max of x, y"""  
    # note: code has a bug!  
    # check if x is larger  
    if x > y:  
        bigger = x  
    return bigger
```

```
maximum = max(3,0)
```

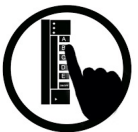
Value of `maximum`?

A: 3

B: 0

C: Error!

D: I do not know



# Control Flow and Variables (A1)

---

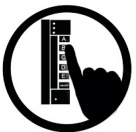
```
def max(x,y):  
    """Returns: max of x, y"""  
    # note: code has a bug!  
    # check if x is larger  
    if x > y:  
        bigger = x  
    return bigger
```

```
maximum = max(3,0)
```

Value of `maximum`?

A: 3      CORRECT  
B: 0  
C: Error!  
D: I do not know

- Local variables last until
  - They are deleted or
  - End of the function
- Even if defined inside `if`



# Control Flow and Variables (Q2)

---

```
def max(x,y):  
    """Returns: max of x, y"""  
    # note: code has a bug!  
    # check if x is larger  
    if x > y:  
        bigger = x  
    return bigger
```

```
maximum = max(0,3)
```

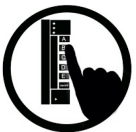
Value of `maximum`?

A: 3

B: 0

C: Error!

D: I do not know





# Control Flow and Variables (A2)

---

```
def max(x,y):  
    """Returns: max of x, y"""  
    # note: code has a bug!  
    # check if x is larger  
    if x > y:  
        bigger = x  
    return bigger
```

```
maximum = max(0,3)
```

Value of `maximum`?

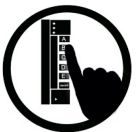
A: 3

B: 0

C: Error!      CORRECT

D: I do not know

- Variable existence depends on flow
- Generally terrible idea to refer to variables defined inside an `if` clause



# If-Elif-Else (Question)

---

```
a = 2
```

```
if a == 2:  
    a = 3  
elif a == 3:  
    a = 4  
print(a)
```

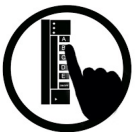
What gets printed?

A: 2

B: 3

C: 4

D: I do not know



# If-Elif-Else (Answer)

---

```
a = 2
```

```
if a == 2:  
    a = 3  
elif a == 3:  
    a = 4  
print(a)
```

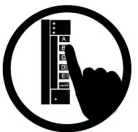
What gets printed?

A: 2

B: 3 CORRECT

C: 4

D: I do not know

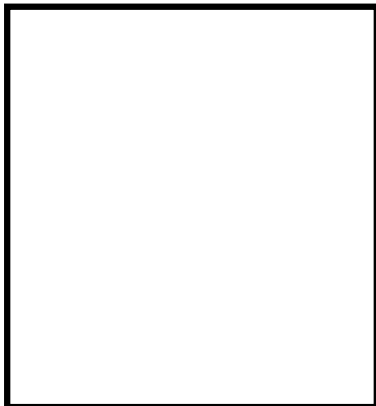
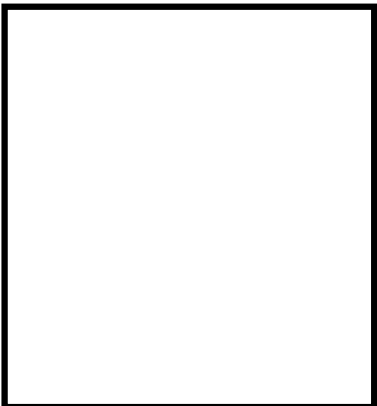


# What gets printed, Round 4

---

```
a = 2
if a == 2:
    a = 3
elif a == 3:
    a = 4
print(a)
```

```
a = 2
if a == 2:
    a = 3
if a == 3:
    a = 4
print(a)
```



# What gets printed, Round 4

---

```
a = 2
if a == 2:
    a = 3
elif a == 3:
    a = 4
print(a)
```

```
a = 2
if a == 2:
    a = 3
if a == 3:
    a = 4
print(a)
```

3

4