

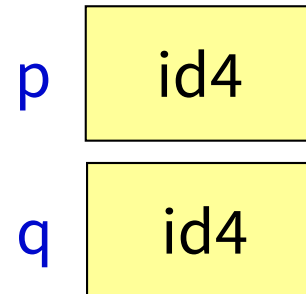
Attribute Assignment (Question)

- ```
>>> p = shapes.Point3(0,0,0)
>>> q = p
```
- Execute the assignments:

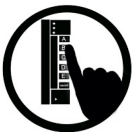
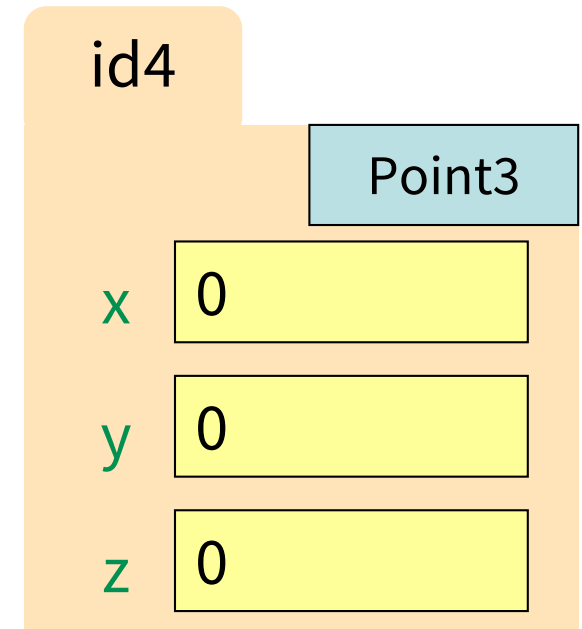
```
>>> p.x = 5
>>> q.x = 7
```
  - What is value of p.x?

A: 5  
B: 7  
C: id4  
D: I don't know

## Global Space



## Heap Space



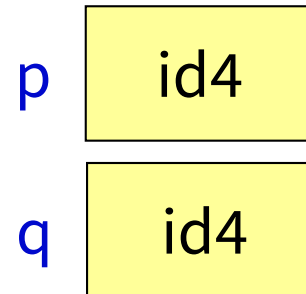
# Attribute Assignment (Solution)

- ```
>>> p = shapes.Point3(0,0,0)
>>> q = p
```
- Execute the assignments:

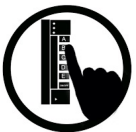
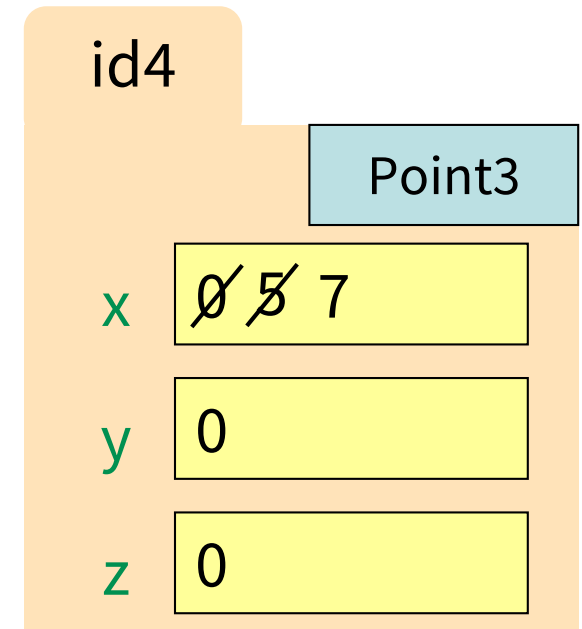
```
>>> p.x = 5
>>> q.x = 7
```
 - What is value of p.x?

A: 5
B: 7 **CORRECT**
C: id4
D: I don't know

Global Space



Heap Space



How Many Folders (Question)

```
import shapes  
p = shapes.Point3(1,2,3)  
q = shapes.Point3(3,4,5)
```

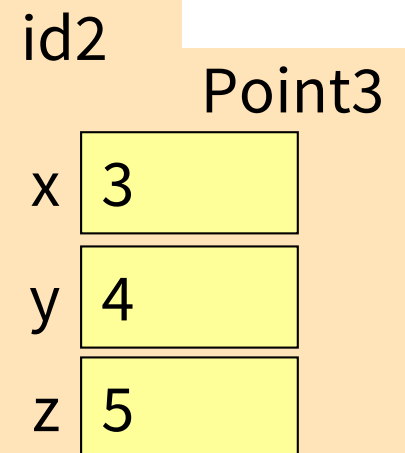
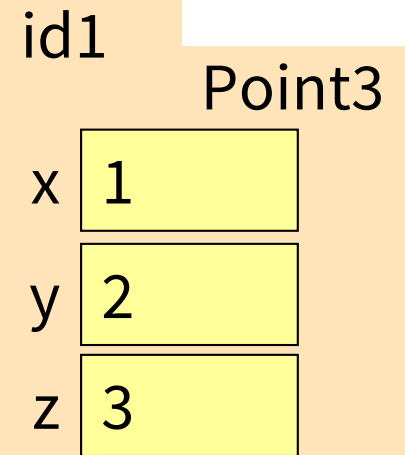
Draw everything that gets created (excluding the module variable & module folder).
How many folders get drawn?

How Many Folders (Solution)

```
import shapes
p = shapes.Point3(1,2,3)
q = shapes.Point3(3,4,5)
```

Draw everything that gets created (excluding the module variable & module folder).
How many folders get drawn?

Heap Space

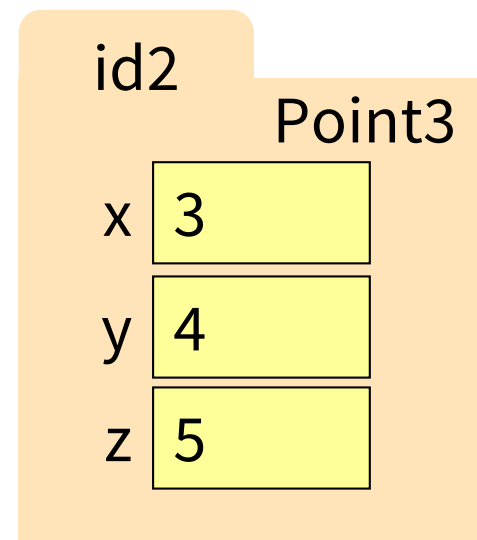
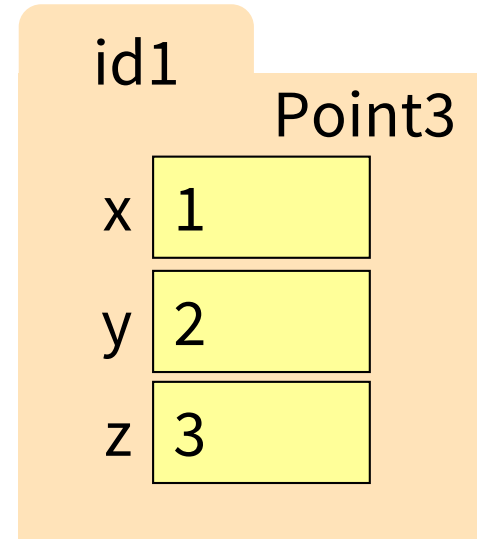


What Else Gets Drawn? (Question)

```
import shapes
p = shapes.Point3(1,2,3)
q = shapes.Point3(3,4,5)
```

Draw everything that gets created (excluding the module variable & module folder).
What else gets drawn?

Heap Space

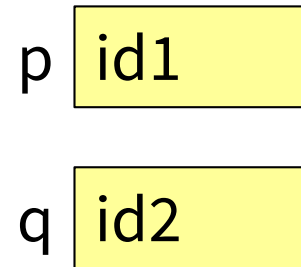


What Else Gets Drawn? (Solution)

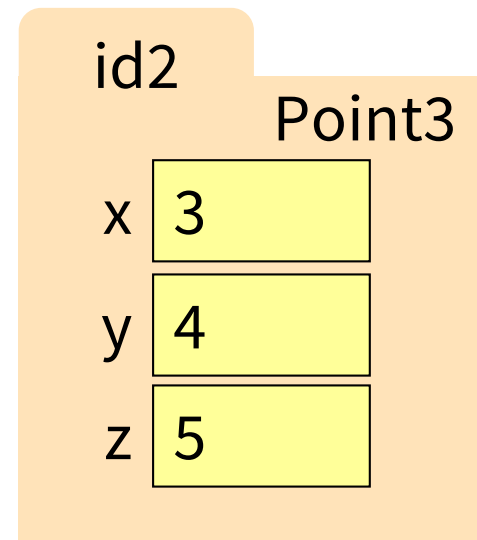
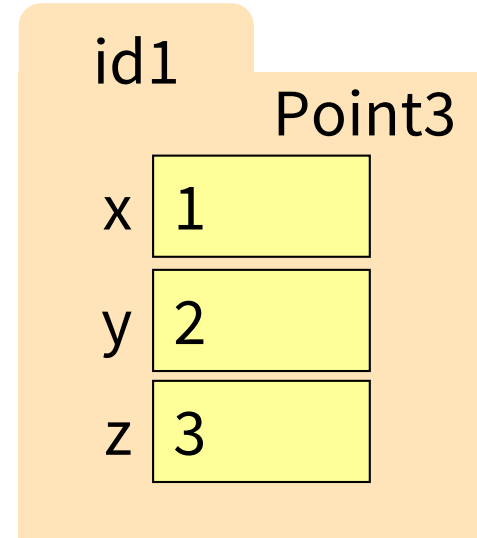
```
import shapes
p = shapes.Point3(1,2,3)
q = shapes.Point3(3,4,5)
```

Draw everything that gets created (excluding the module variable & module folder).
What else gets drawn?

Global Space



Heap Space





Swap Attributes (Question)

```
import shapes
p = shapes.Point3(1,2,3)
q = shapes.Point3(3,4,5)

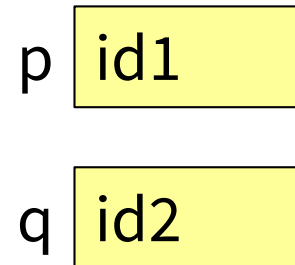
def swap_x(p, q):
    1 t = p.x
    2 p.x = q.x
    3 q.x = t

swap_x(p, q)
```

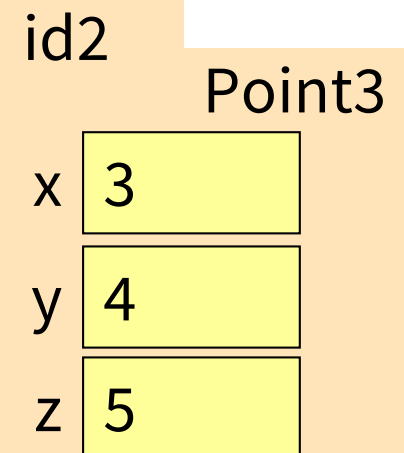
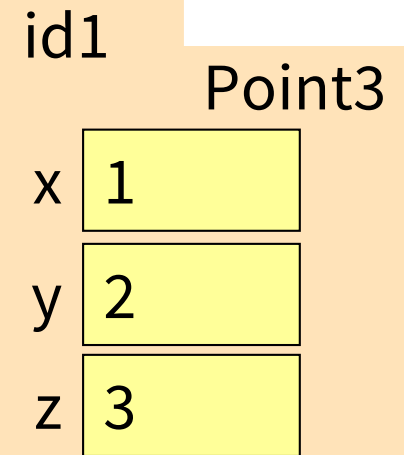
What is in `p.x` at the end of this code?

- A: 0 D: 3 **CORRECT**
B: 1 E: I don't know
C: 2

Global Space



Heap Space





Swap Attributes (Solution)

```
import shapes
p = shapes.Point3(1,2,3)
q = shapes.Point3(3,4,5)

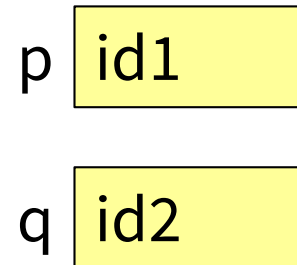
def swap_x(p, q):
    1 t = p.x
    2 p.x = q.x
    3 q.x = t

swap_x(p, q)
```

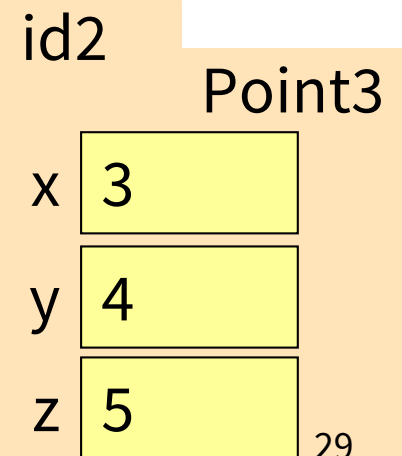
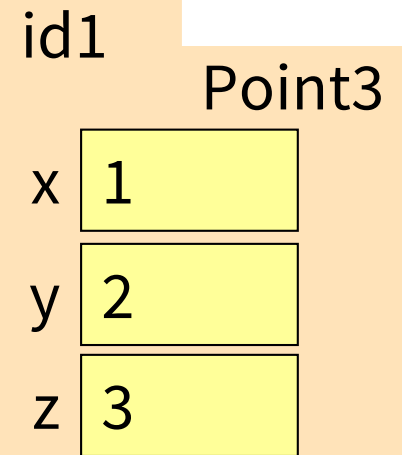
What is in `p.x` at the end of this code?

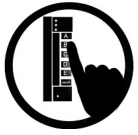
- A: 0 D: 3 **CORRECT**
B: 1 E: I don't know
C: 2

Global Space



Heap Space





Swap Attributes (Explanation-1)

```
import shapes
p = shapes.Point3(1,2,3)
q = shapes.Point3(3,4,5)

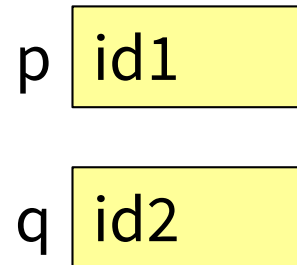
def swap_x(p, q):
    1 t = p.x
    2 p.x = q.x
    3 q.x = t

swap_x(p, q)
```

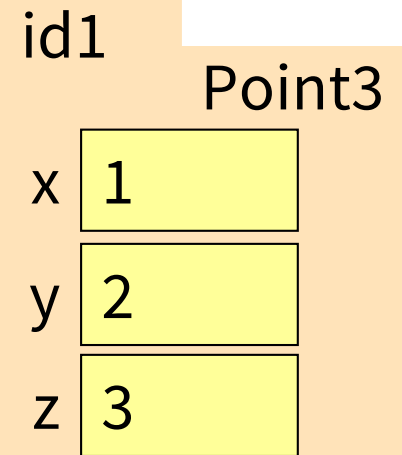
What is in `p.x` at the end of this code?

- A: 0 D: 3 **CORRECT**
B: 1 E: I don't know
C: 2

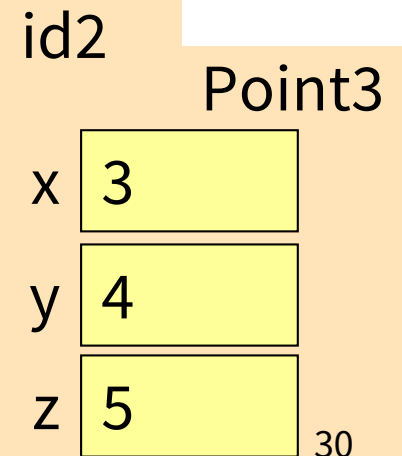
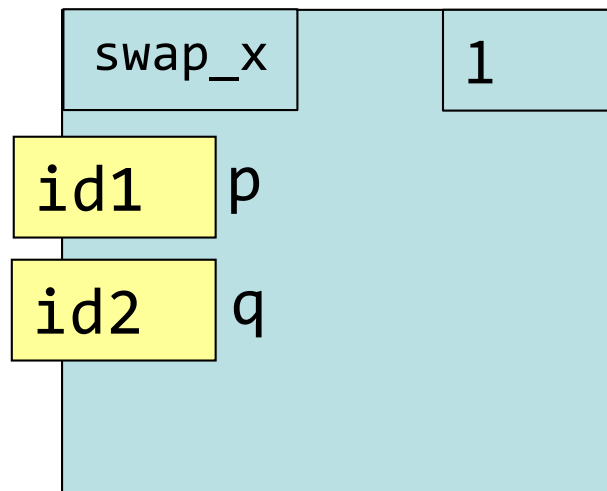
Global Space

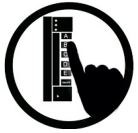


Heap Space



Call Stack (w/1Frame)





Swap Attributes (Explanation-2)

```
import shapes
p = shapes.Point3(1,2,3)
q = shapes.Point3(3,4,5)

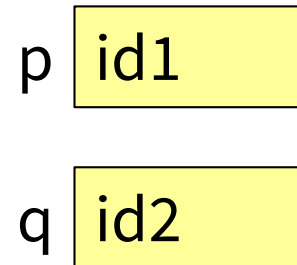
def swap_x(p, q):
    1 t = p.x
    2 p.x = q.x
    3 q.x = t

swap_x(p, q)
```

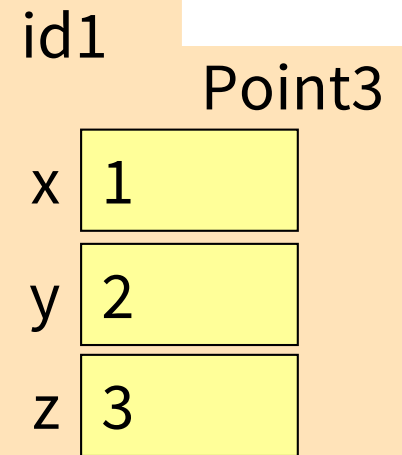
What is in `p.x` at the end of this code?

- A: 0 D: 3 **CORRECT**
- B: 1 E: I don't know
- C: 2

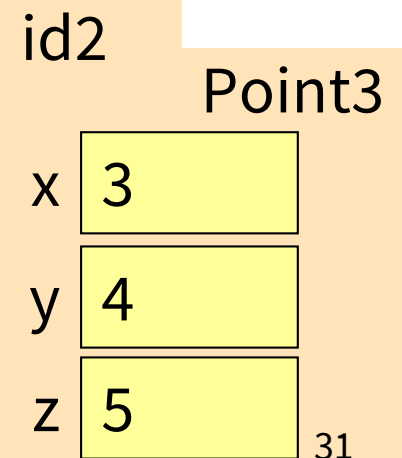
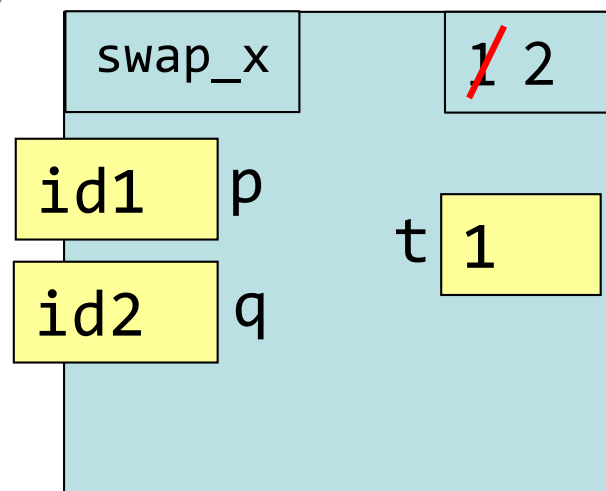
Global Space

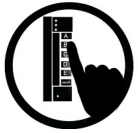


Heap Space



Call Stack (w/1Frame)





Swap Attributes (Explanation-3)

```
import shapes
p = shapes.Point3(1,2,3)
q = shapes.Point3(3,4,5)

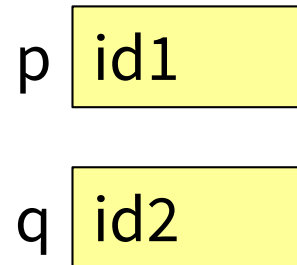
def swap_x(p, q):
  1 t = p.x
  2 p.x = q.x
  3 q.x = t

swap_x(p, q)
```

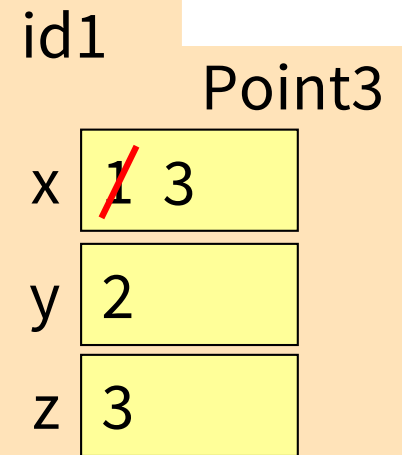
What is in `p.x` at the end of this code?

- A: 0
- B: 1
- C: 2
- D: 3 **CORRECT**
- E: I don't know

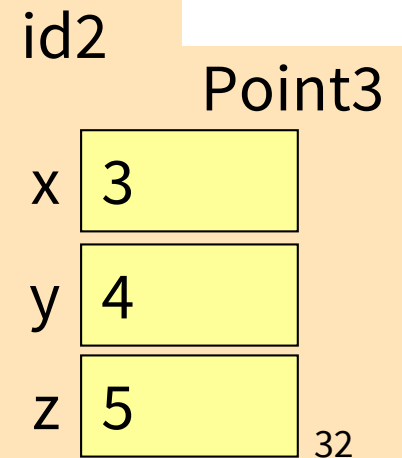
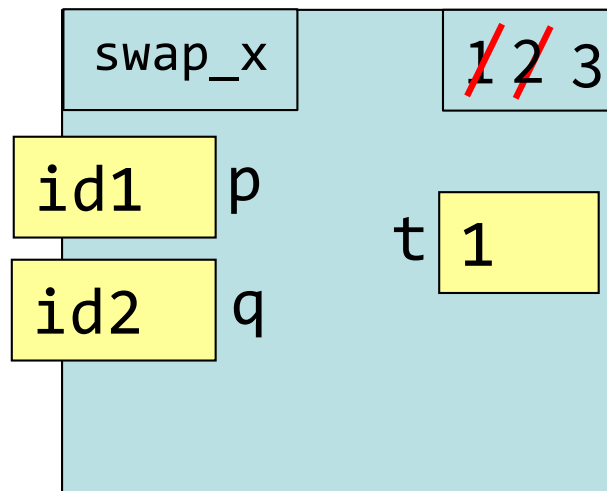
Global Space



Heap Space



Call Stack (w/1Frame)





Swap Attributes (Explanation-4)

```
import shapes
p = shapes.Point3(1,2,3)
q = shapes.Point3(3,4,5)

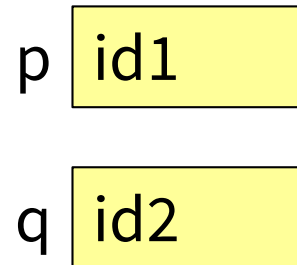
def swap_x(p, q):
1   t = p.x
2   p.x = q.x
3   q.x = t

swap_x(p, q)
```

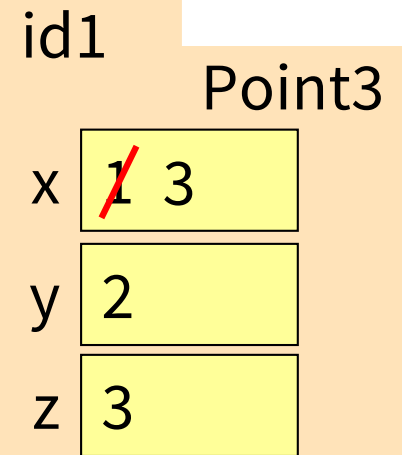
What is in `p.x` at the end of this code?

- A: 0
- B: 1
- C: 2
- D: 3 **CORRECT**
- E: I don't know

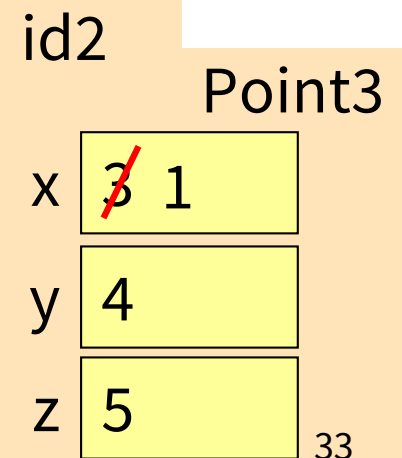
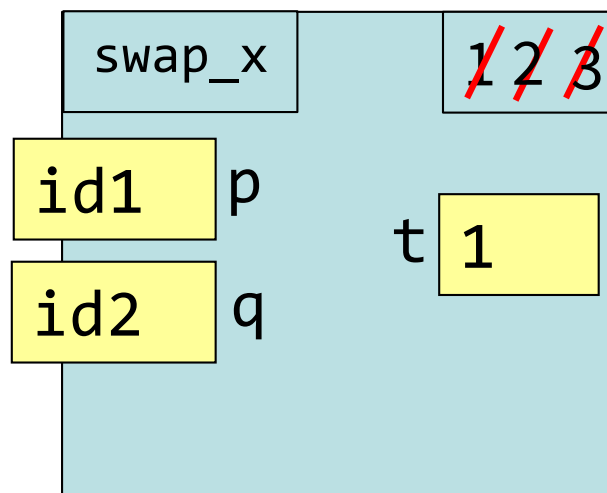
Global Space

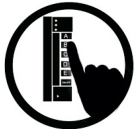


Heap Space



Call Stack (w/1Frame)





Swap Attributes (Explanation-5)

```
import shapes
p = shapes.Point3(1,2,3)
q = shapes.Point3(3,4,5)

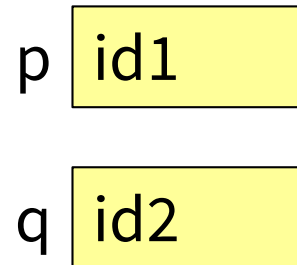
def swap_x(p, q):
    1 t = p.x
    2 p.x = q.x
    3 q.x = t

swap_x(p, q)
```

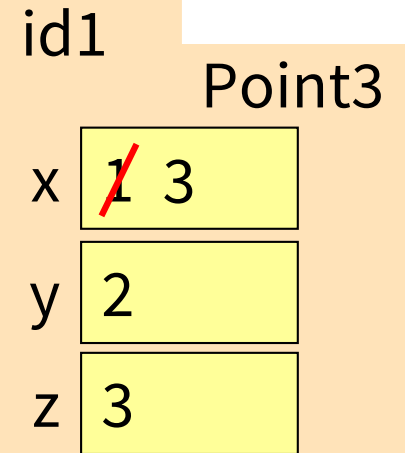
What is in `p.x` at the end of this code?

- A: 0
- B: 1
- C: 2
- D: 3 **CORRECT**
- E: I don't know

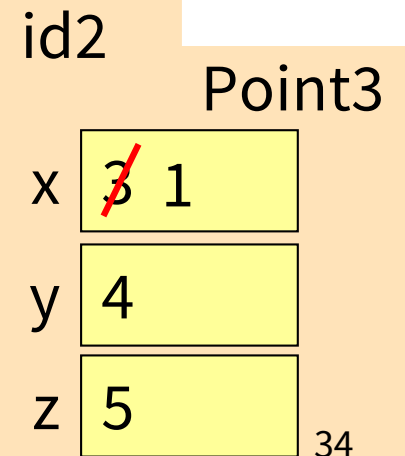
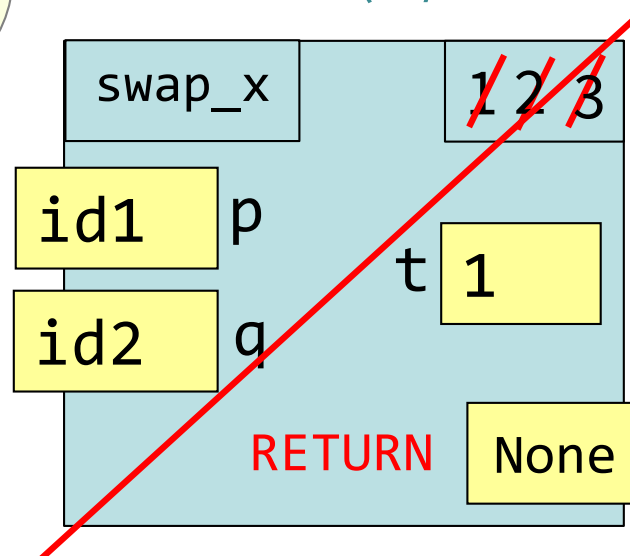
Global Space



Heap Space



Call Stack (w/1Frame)





Global p (Question)

```
import shapes
p = shapes.Point3(1,2,3)
q = shapes.Point3(3,4,5)

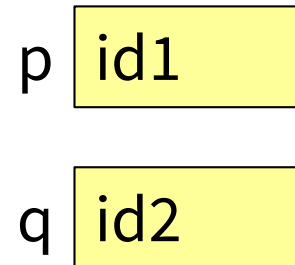
def swap(p, q):
    1 t = p
    2 p = q
    3 q = t

swap(p, q)
```

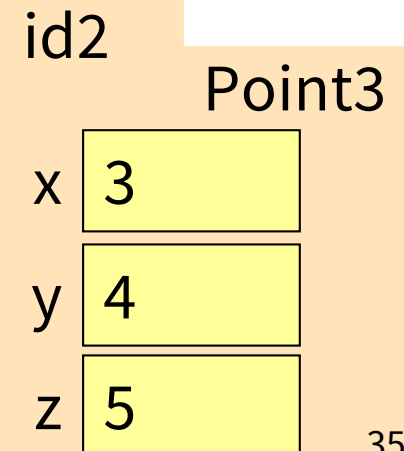
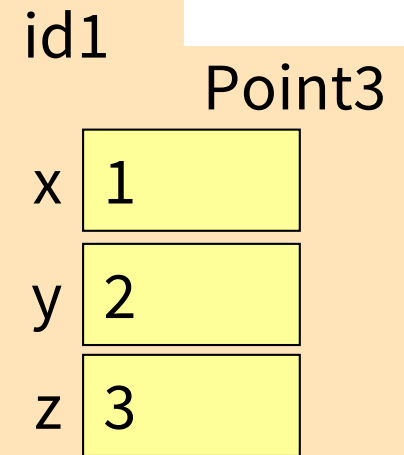
What is in global p after calling swap?

- A: id1
- B: id2 D: 2
- C: 1 E: I don't know

Global Space



Heap Space





Global p (Solution)

```
import shapes
p = shapes.Point3(1,2,3)
q = shapes.Point3(3,4,5)

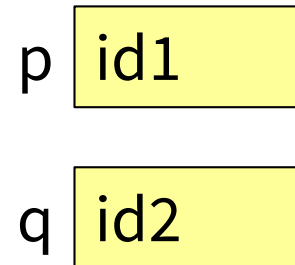
def swap(p, q):
    1 t = p
    2 p = q
    3 q = t

swap(p, q)
```

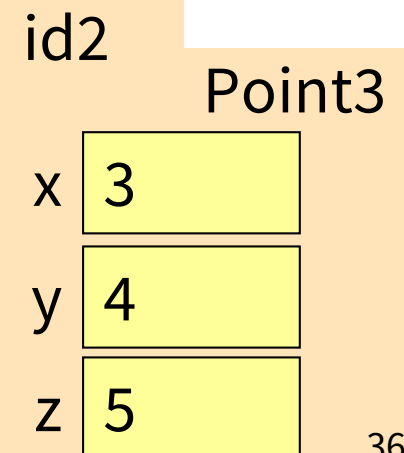
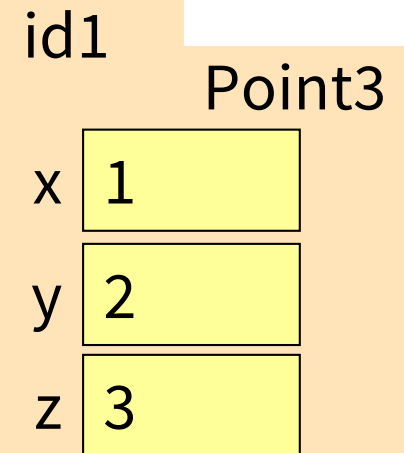
What is in global p after calling swap?

- A: id1 ← CORRECT
B: id2 D: 2
C: 1 E: I don't know

Global Space



Heap Space





Global p (Explanation-1)

```
import shapes
p = shapes.Point3(1,2,3)
q = shapes.Point3(3,4,5)

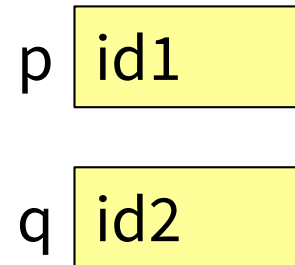
def swap(p, q):
    1 t = p
    2 p = q
    3 q = t

swap(p, q)
```

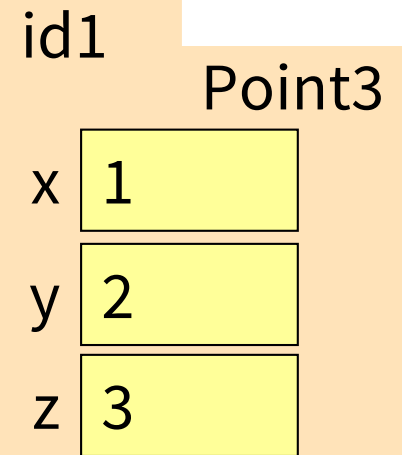
What is in global p after calling swap?

- A: id1 ← CORRECT
- B: id2 D: 2
- C: 1 E: I don't know

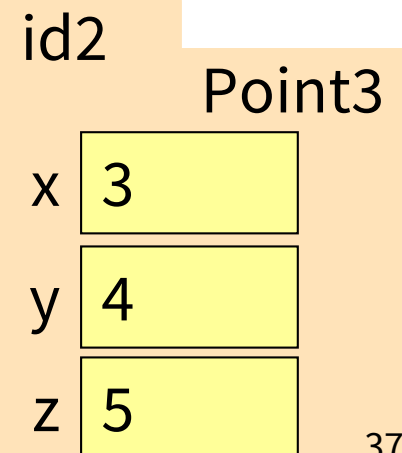
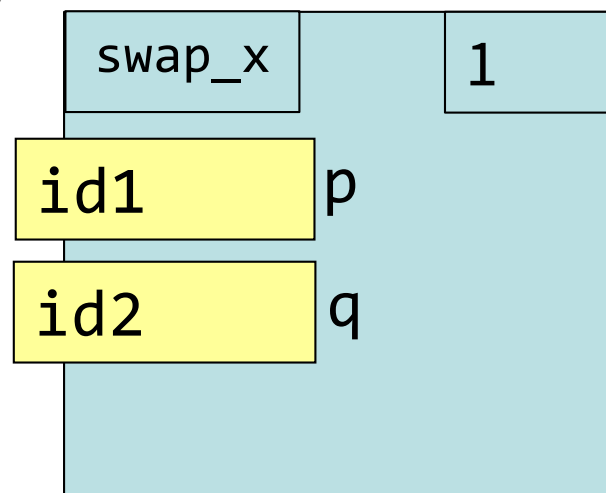
Global Space

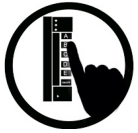


Heap Space



Call Stack (w/1Frame)





Global p (Explanation-2)

```
import shapes
p = shapes.Point3(1,2,3)
q = shapes.Point3(3,4,5)

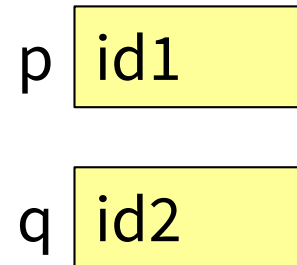
def swap(p, q):
    1 t = p
    2 p = q
    3 q = t

swap(p, q)
```

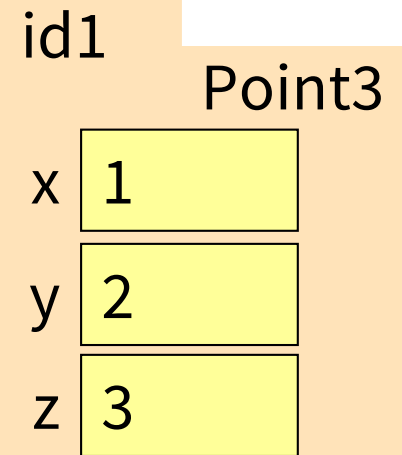
What is in global p after calling swap?

- A: id1 ← CORRECT
- B: id2 D: 2
- C: 1 E: I don't know

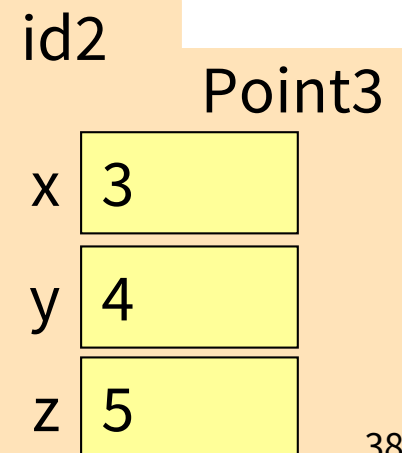
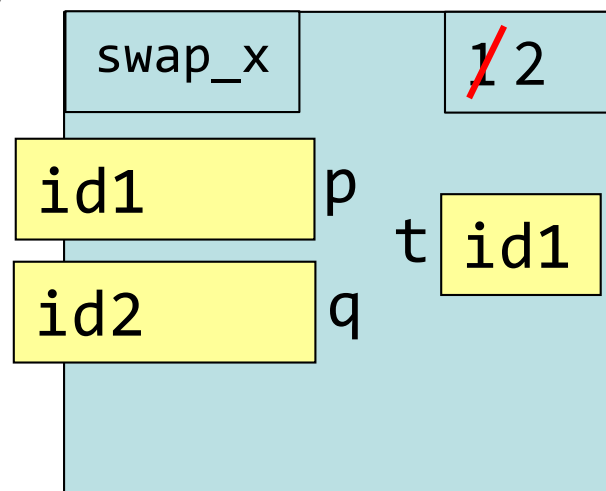
Global Space

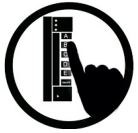


Heap Space



Call Stack (w/1Frame)



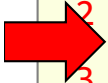


Global p (Explanation-3)

```
import shapes
p = shapes.Point3(1,2,3)
q = shapes.Point3(3,4,5)

def swap(p, q):
  1 t = p
  2 p = q
  3 q = t

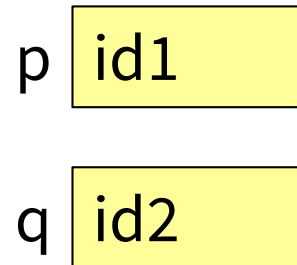
swap(p, q)
```



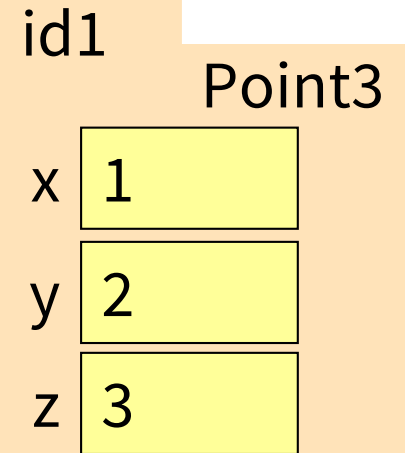
What is in global p after calling swap?

- A: id1 ← CORRECT
- B: id2 D: 2
- C: 1 E: I don't know

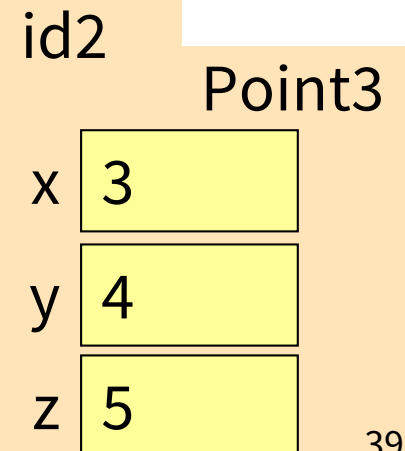
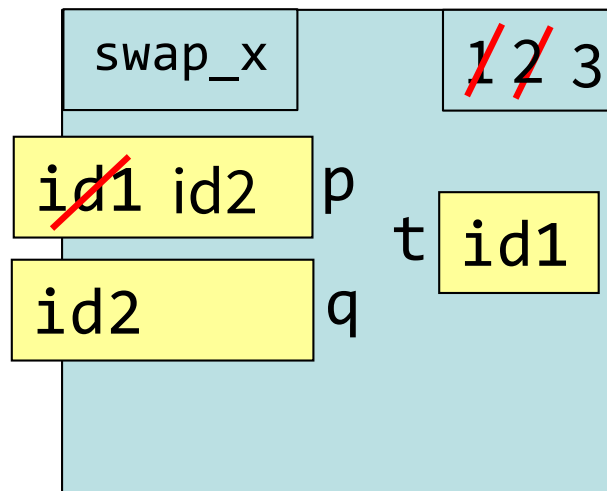
Global Space

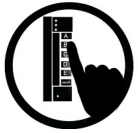


Heap Space



Call Stack (w/1Frame)





Global p (Explanation-4)

```
import shapes
p = shapes.Point3(1,2,3)
q = shapes.Point3(3,4,5)

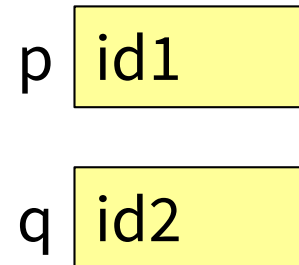
def swap(p, q):
1   t = p
2   p = q
3   q = t

swap(p, q)
```

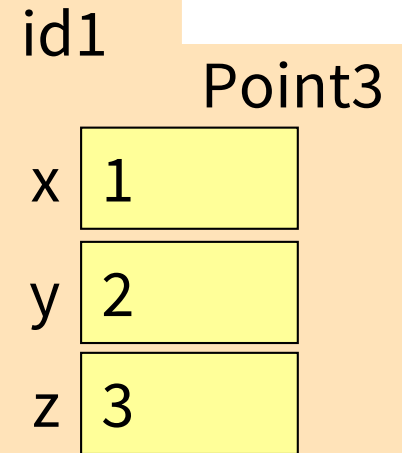
What is in global p after calling swap?

- A: id1 ← CORRECT
- B: id2 D: 2
- C: 1 E: I don't know

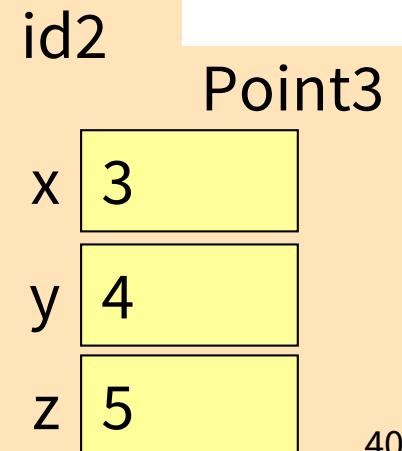
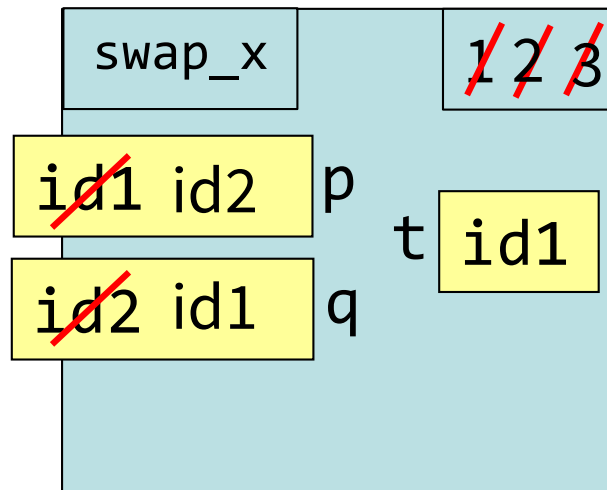
Global Space

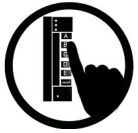


Heap Space



Call Stack (w/1Frame)





Global p (Explanation-5)

```
import shapes
p = shapes.Point3(1,2,3)
q = shapes.Point3(3,4,5)
```

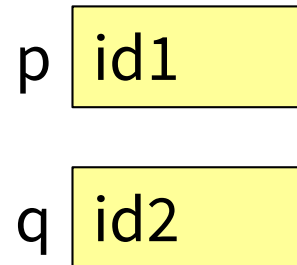
```
def swap(p, q):
1   t = p
2   p = q
3   q = t
```

swap(p, q)

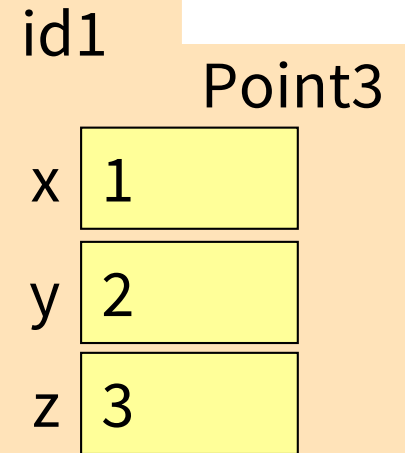
What is in global p after calling swap?

- A: id1 ← CORRECT
- B: id2 D: 2
- C: 1 E: I don't know

Global Space



Heap Space



Call Stack (w/1Frame)

