

Intro to Coding with Python—Animation

Dr. Ab Mosca (they/them)

Slides based off slides courtesy of Jordan Crouser (<https://jcrouser.github.io/>)

Plan for Today

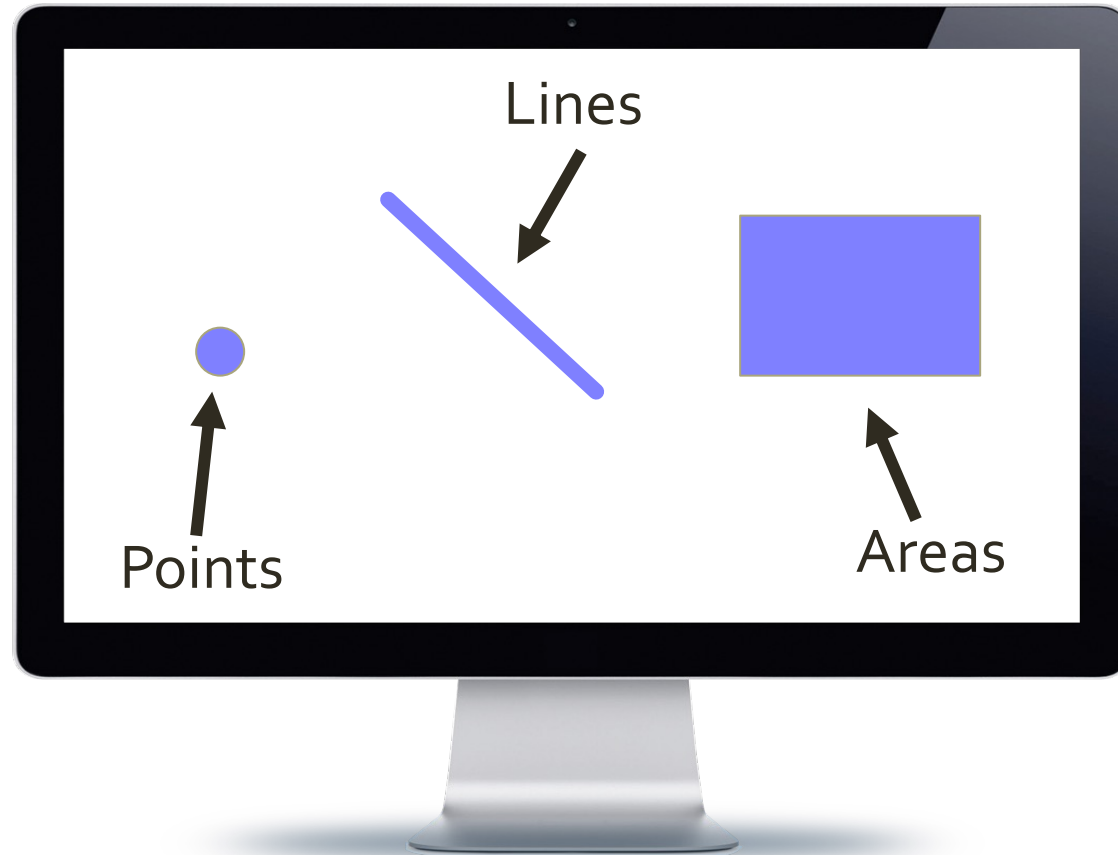
- Final Project
- Animation basics
 - understanding motion
 - the `.move()` method
 - keeping objects on the screen

Final Project

- Please read the final project instructions, if you have any questions, please ask!
- While that happens, if you need help downloading the graphics package, please let me know

✓ Draw stuff

“graphical primitives”



✓ Draw stuff

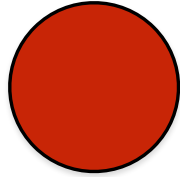
using the **graphics** module



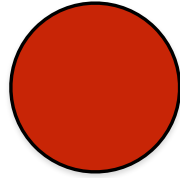
2. Make it
move



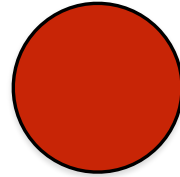
Animation basics



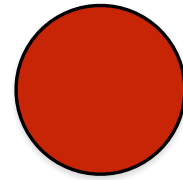
Animation basics



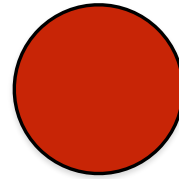
Animation basics



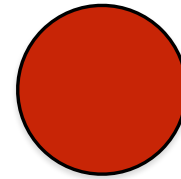
Animation basics



Animation basics



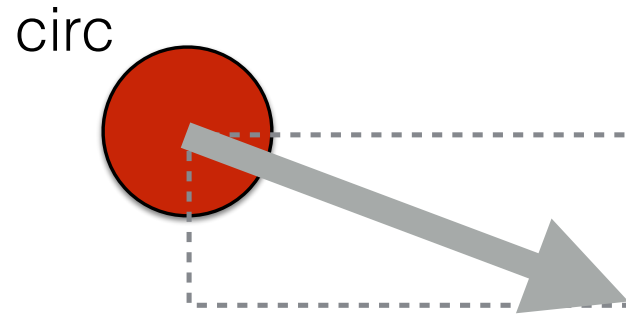
Animation basics



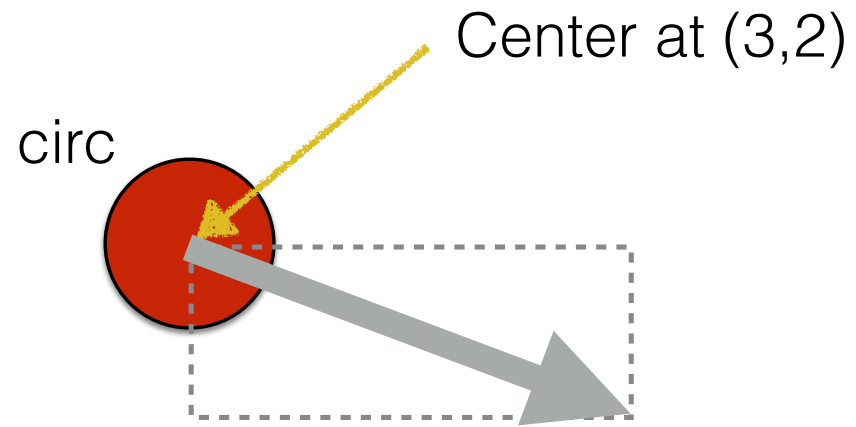
Discussion

What do I need to **be able do**
to make that happen?

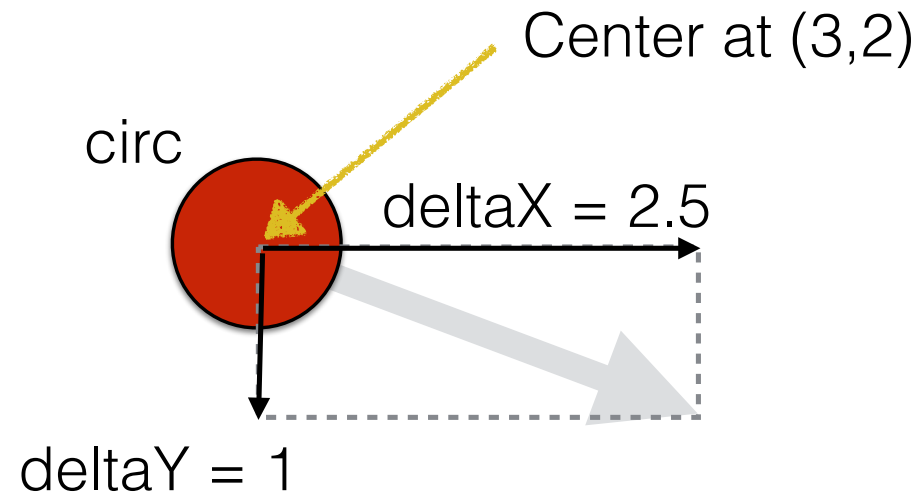
Understanding motion



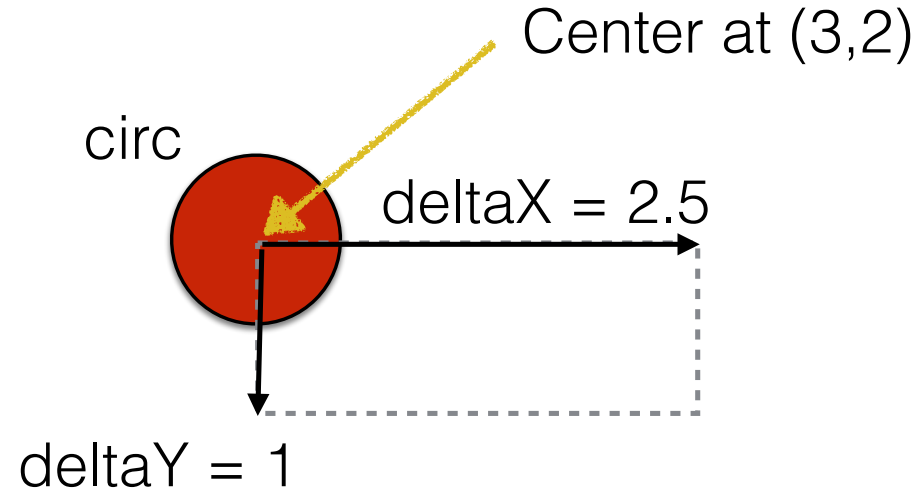
Understanding motion



Understanding motion



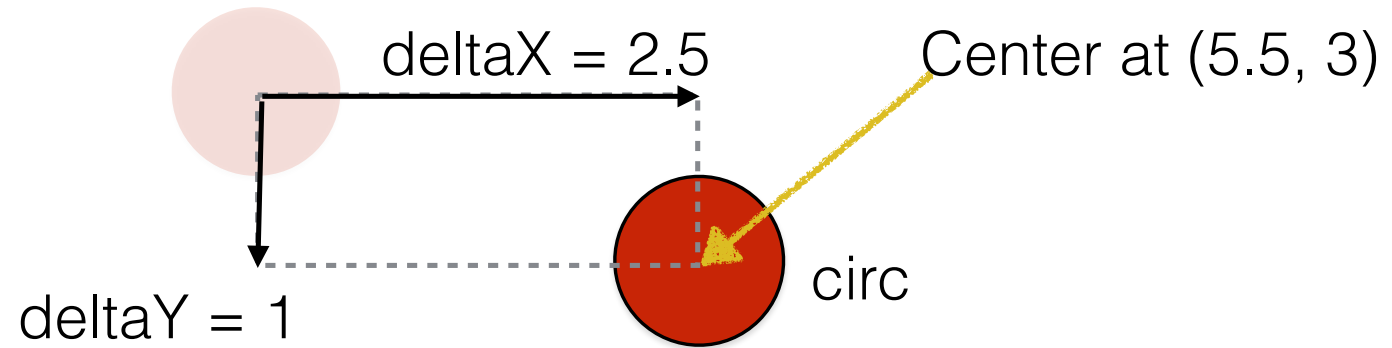
The `.move()` method



```
circ.move( deltaX, deltaY )
```



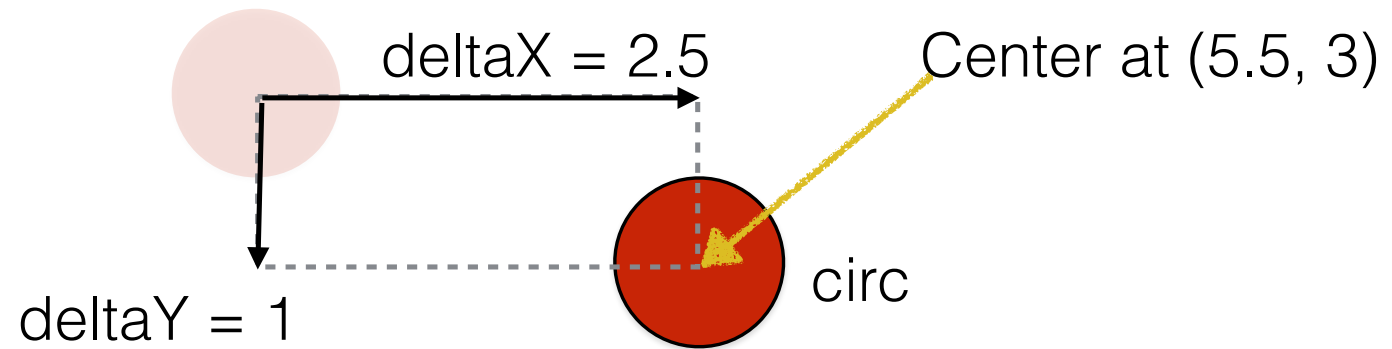
The `.move()` method



```
circ.move( deltaX, deltaY )
```



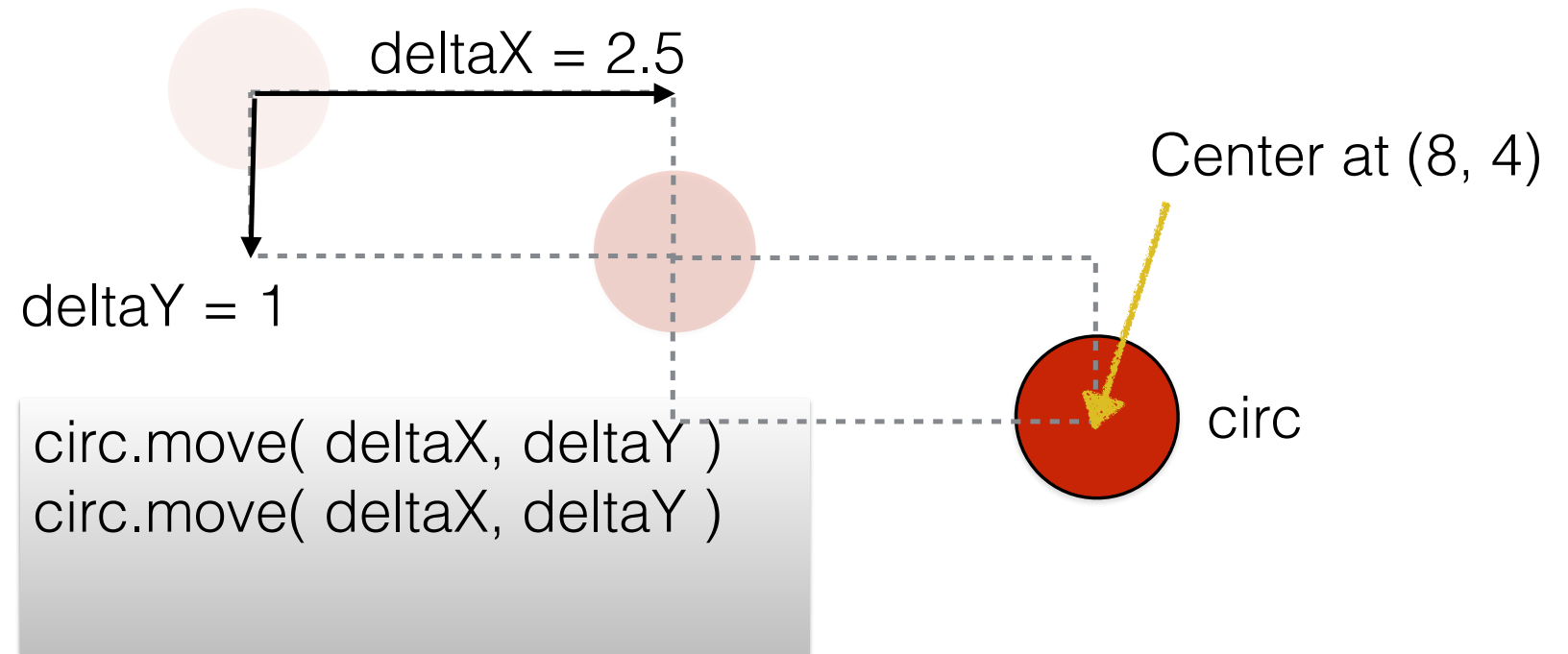
Animation: call
`.move()`
method >1x



```
circ.move( deltaX, deltaY )  
circ.move( deltaX, deltaY )
```



Animation: call
`.move()`
method >1x



Basic organization of animation `main()`

```
def main():  
    # 1. open the graphics window  
    # 2. define/initialize graphic objects  
    # 3. start animation loop, stop on  
    #     specific user interaction  
    while win.checkMouse() == None:  
        # 4. move/update each object  
    # Loop is over.  
    # 5. close the graphic window
```

Our first
animated
graphics
program

DEMO
TIME

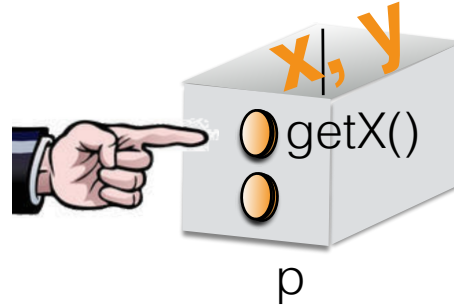
Discussion

How do we keep an object from
moving off the screen?

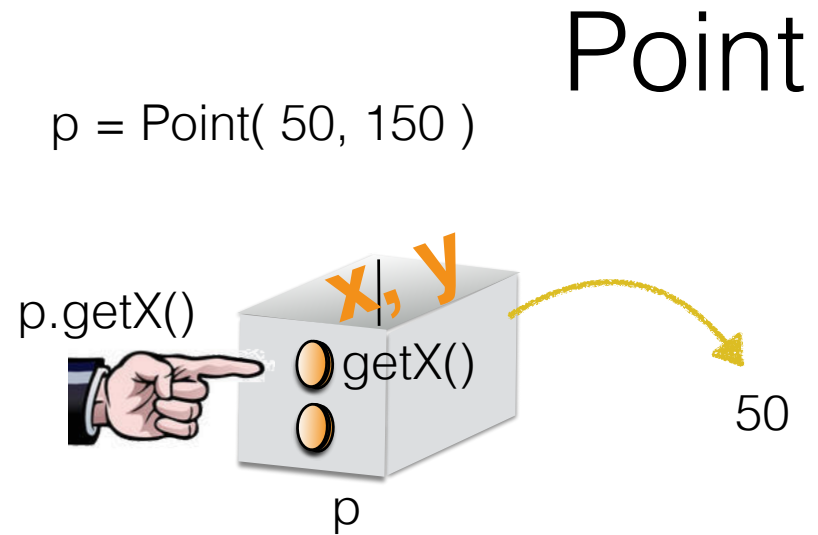
Every
graphics
element is an
Object...

Point

```
p = Point( 50, 150 )
```

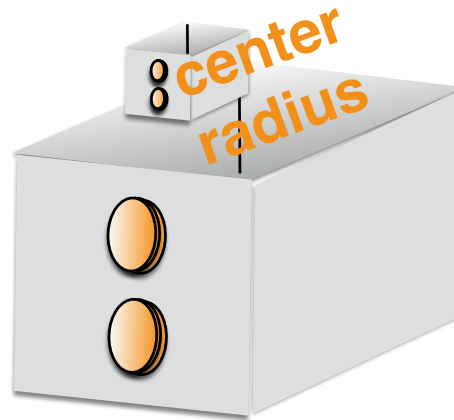


Every
graphics
element is an
Object...



Every
graphics
element is an
Object...

Circle

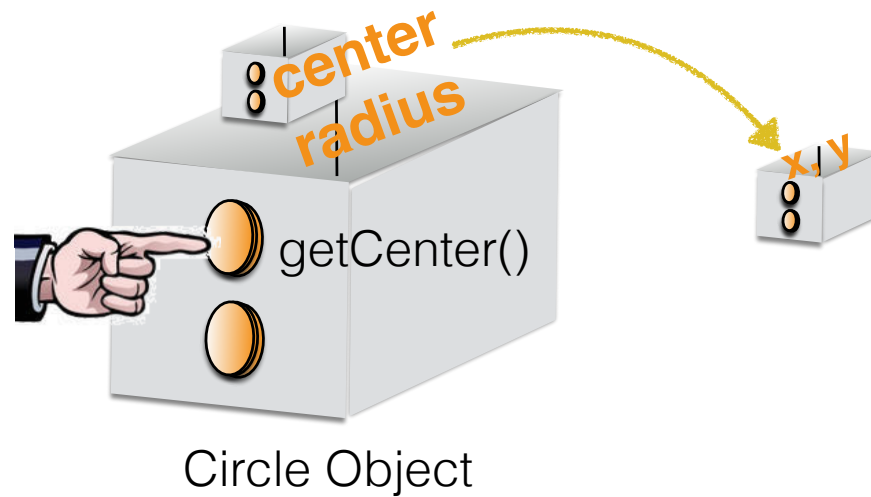


Circle Object



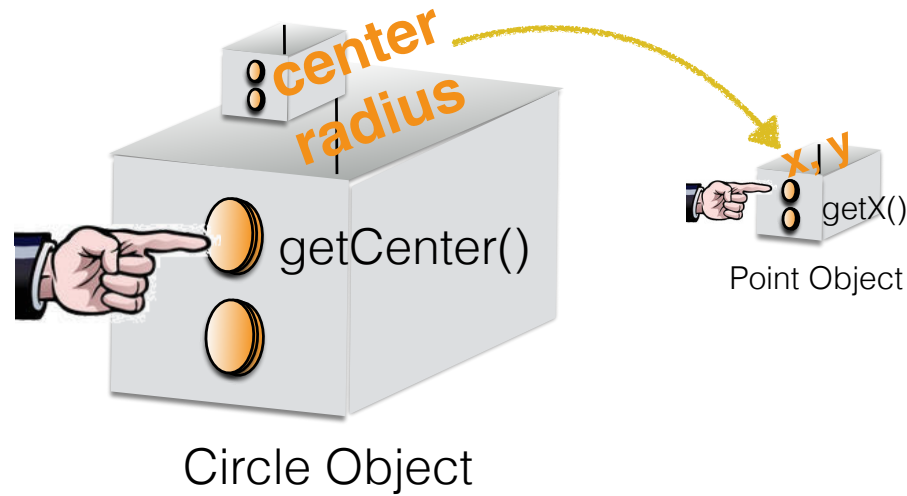
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Circle



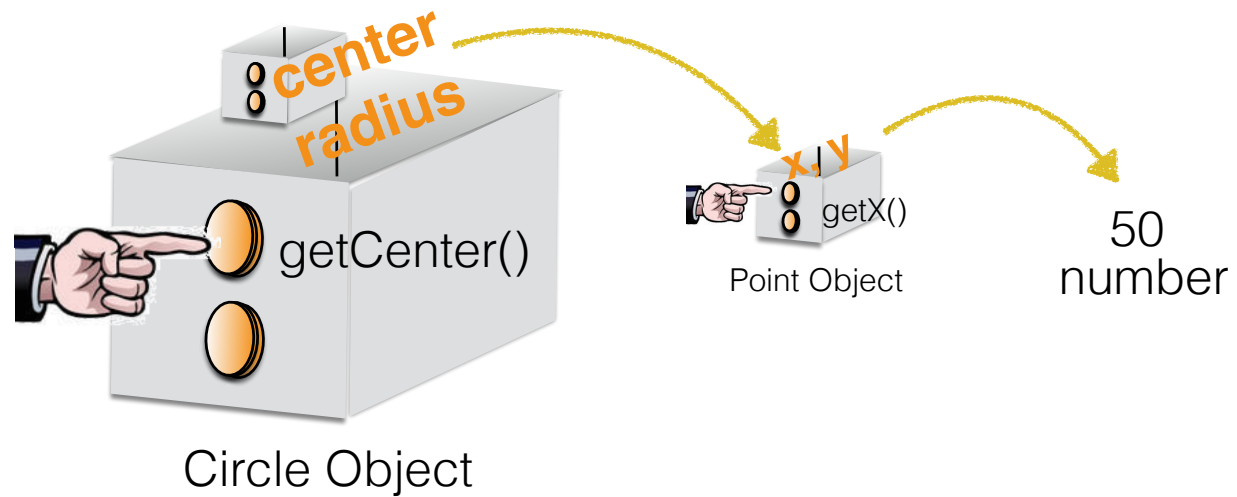
Every
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Circle



Every
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Object...

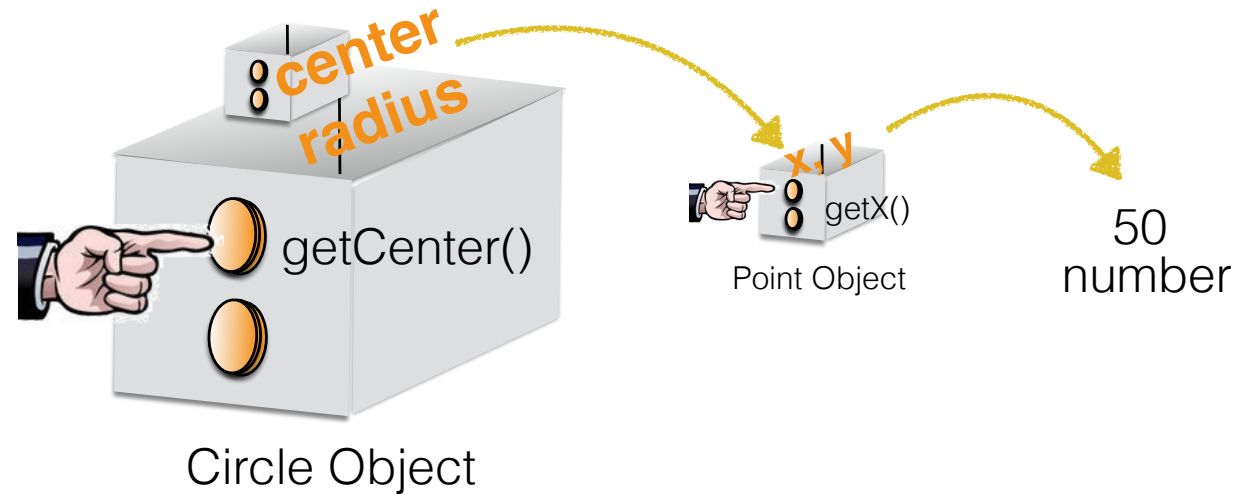
Circle



Every
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element is an
Object...

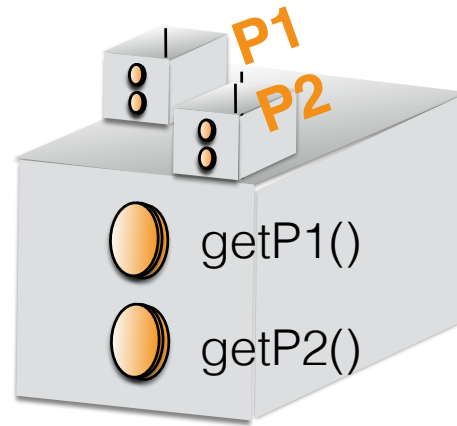
Circle

```
x = circ.getCenter().getX()
```



Every
graphics
element is an
Object...

Rectangle

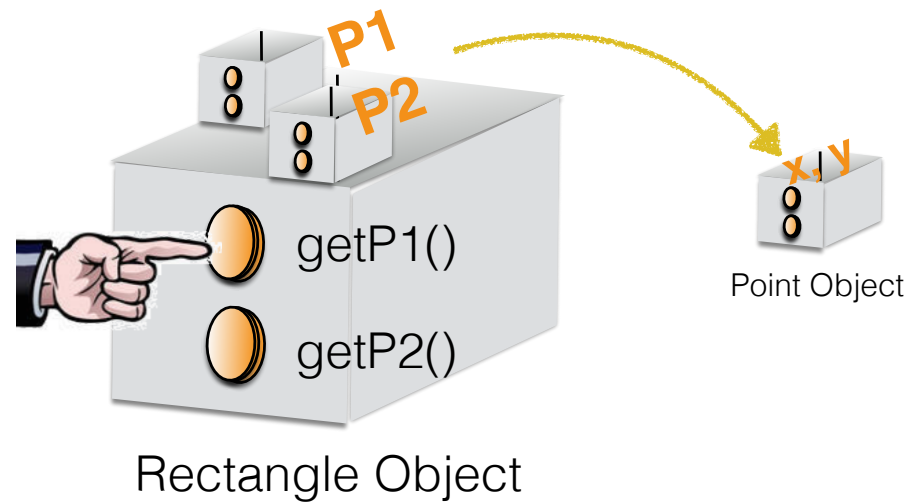


Rectangle Object



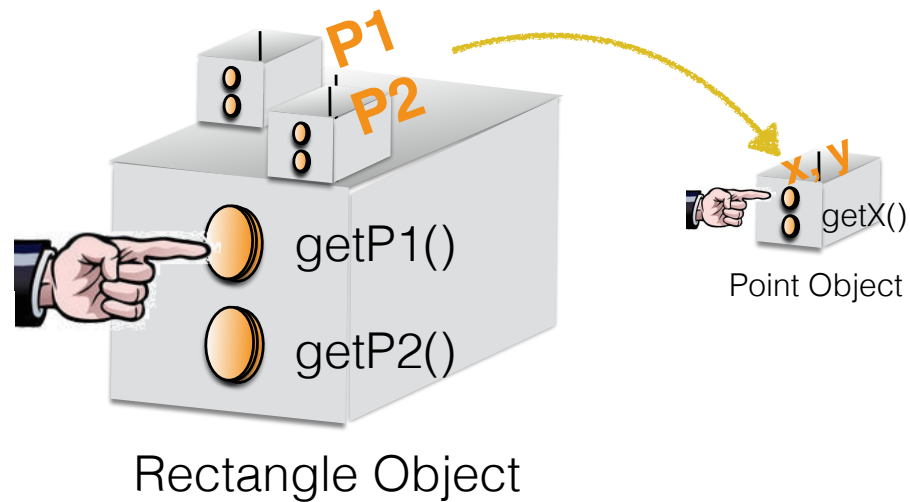
Every
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Object...

Rectangle



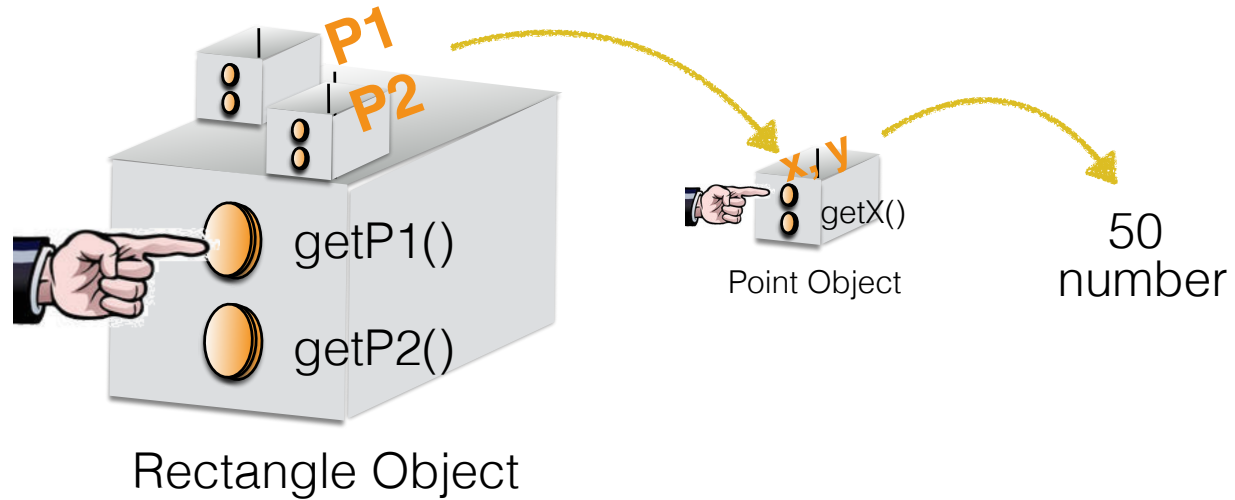
Every
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Object...

Rectangle



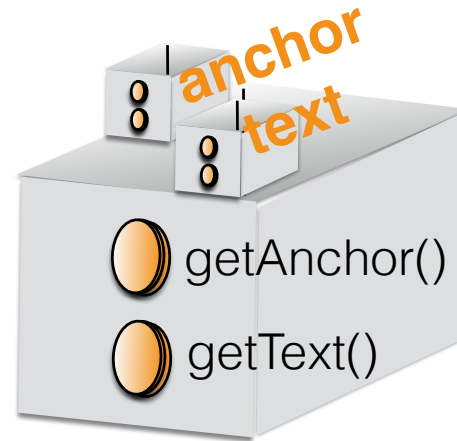
Every
graphics
element is an
Object...

Rectangle



Every
graphics
element is an
Object...

Text (label)

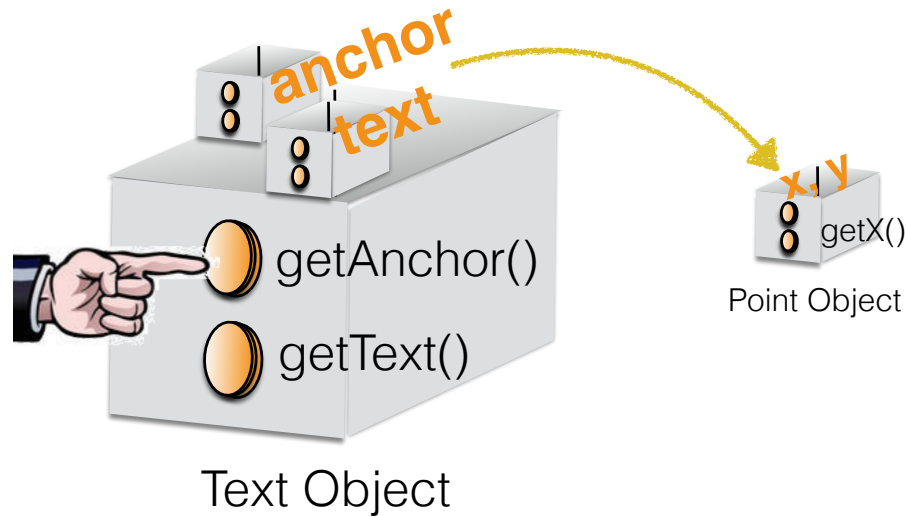


Text Object



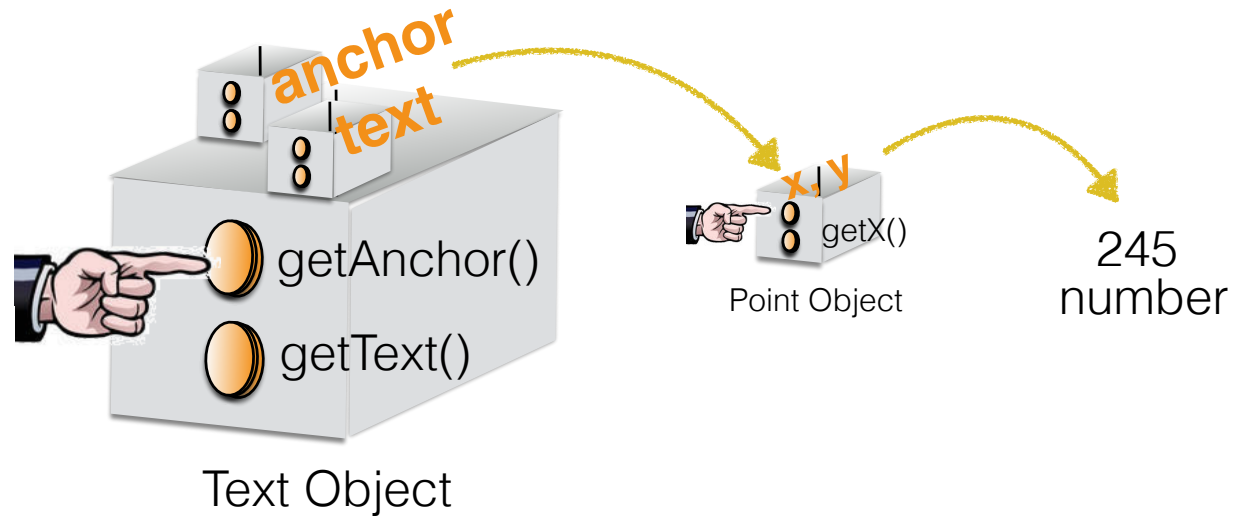
Every
graphics
element is an
Object...

Text (label)



Every
graphics
element is an
Object...

Text (label)



Discussion (again)

Using this, how do we keep an object from
moving off the screen?

15 minute
activity:
bouncing ball

1. Modify ball.py so that the ball bounces around the screen
2. Modify your fist from last class so that it swims back and forth across the screen