

# Intro to Coding with Python—Animation

Dr. Ab Mosca (they/them)

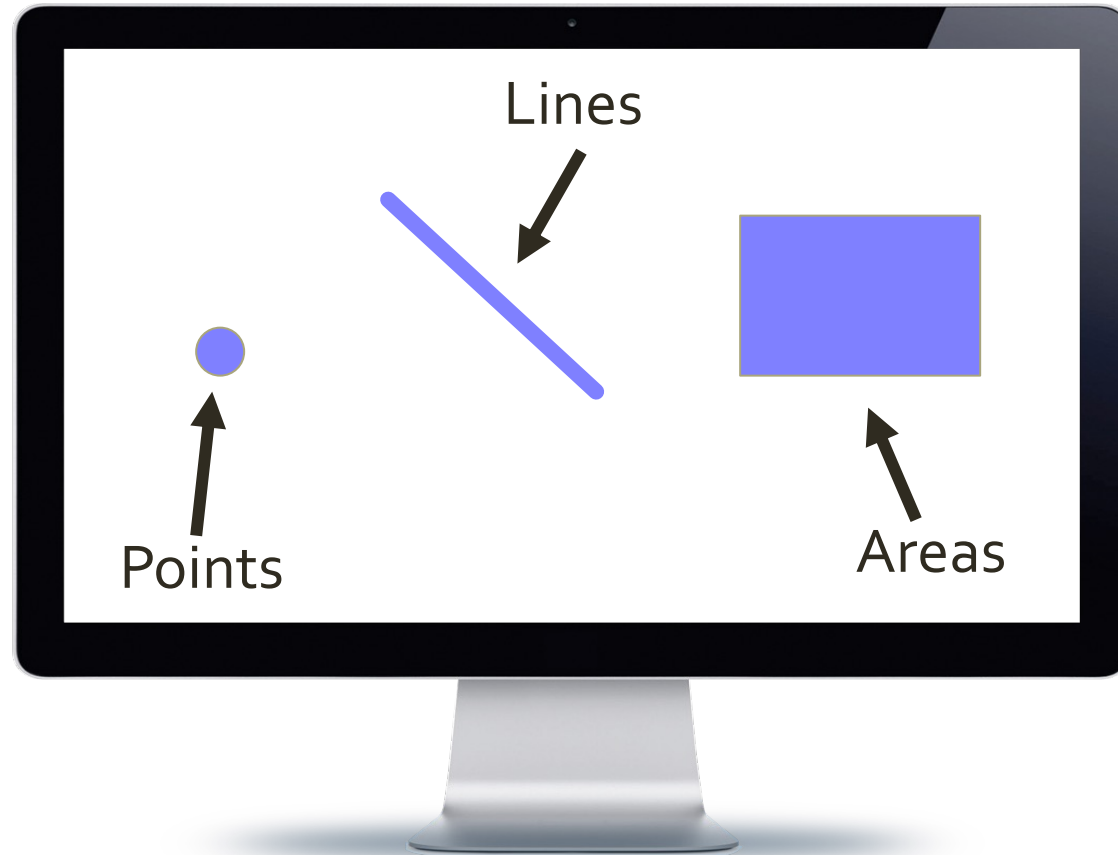
Slides based off slides courtesy of Jordan Crouser (<https://jcrouser.github.io/>)

# Plan for Today

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

✓ Draw stuff

“graphical primitives”



✓ Draw stuff

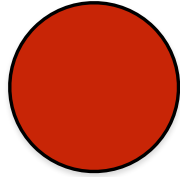
using the **graphics** module



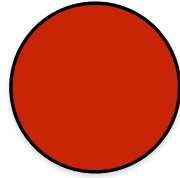
2. Make it  
move



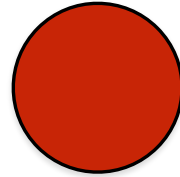
# Animation basics



# Animation basics

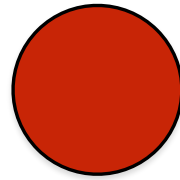


# Animation basics

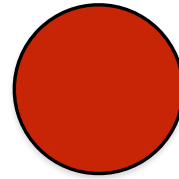




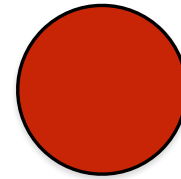
# Animation basics



# Animation basics



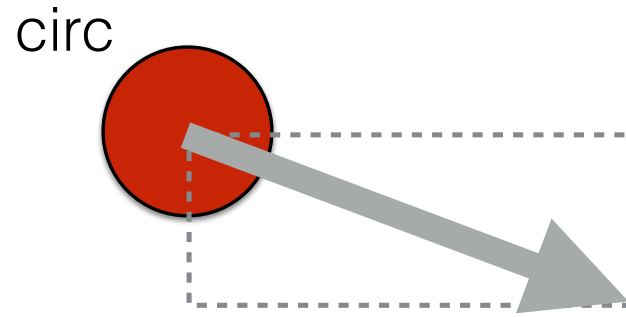
# Animation basics



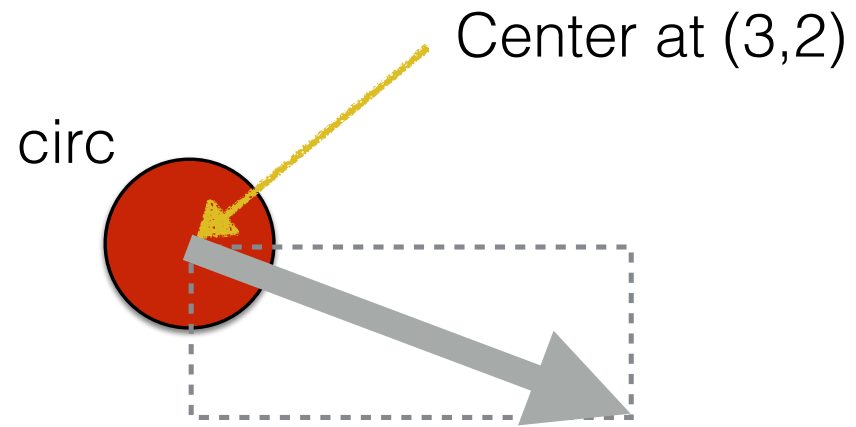
# Discussion

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

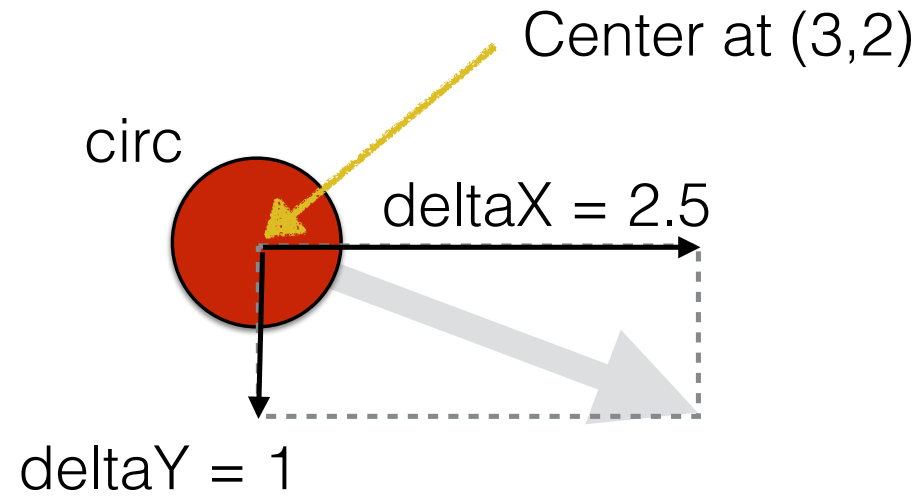
# Understanding motion



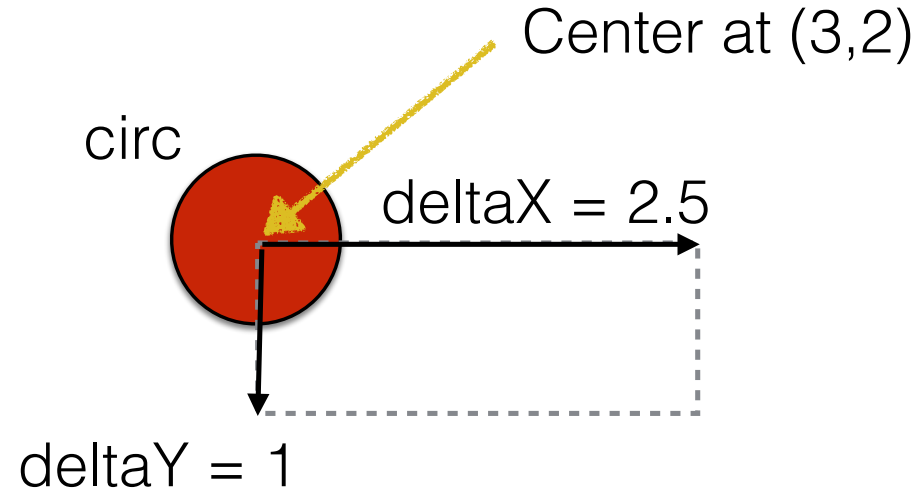
# Understanding motion



# Understanding motion



# The `.move()` method

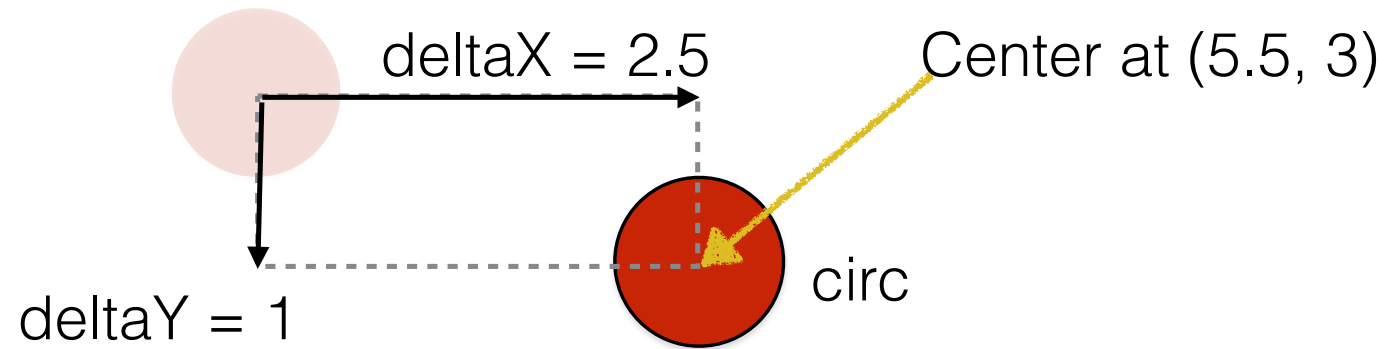


```
circ.move( deltaX, deltaY )
```





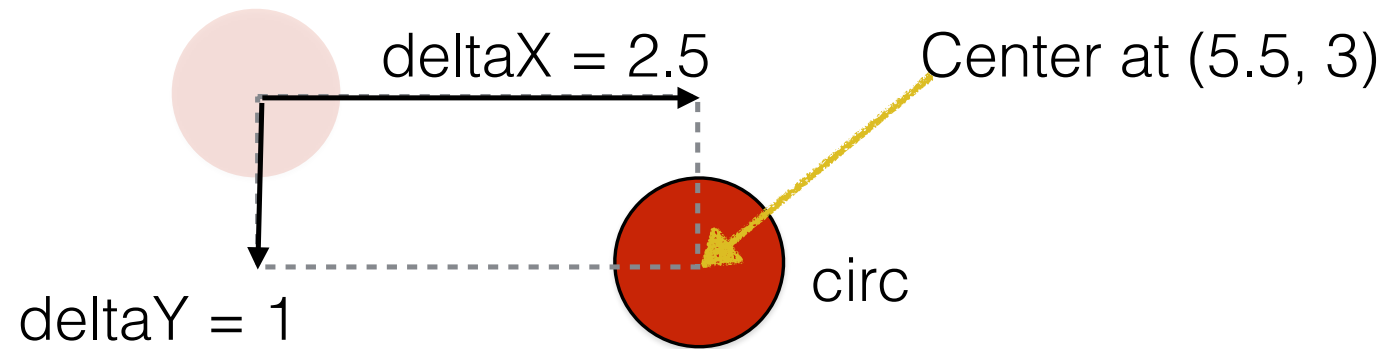
# The `.move()` method



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



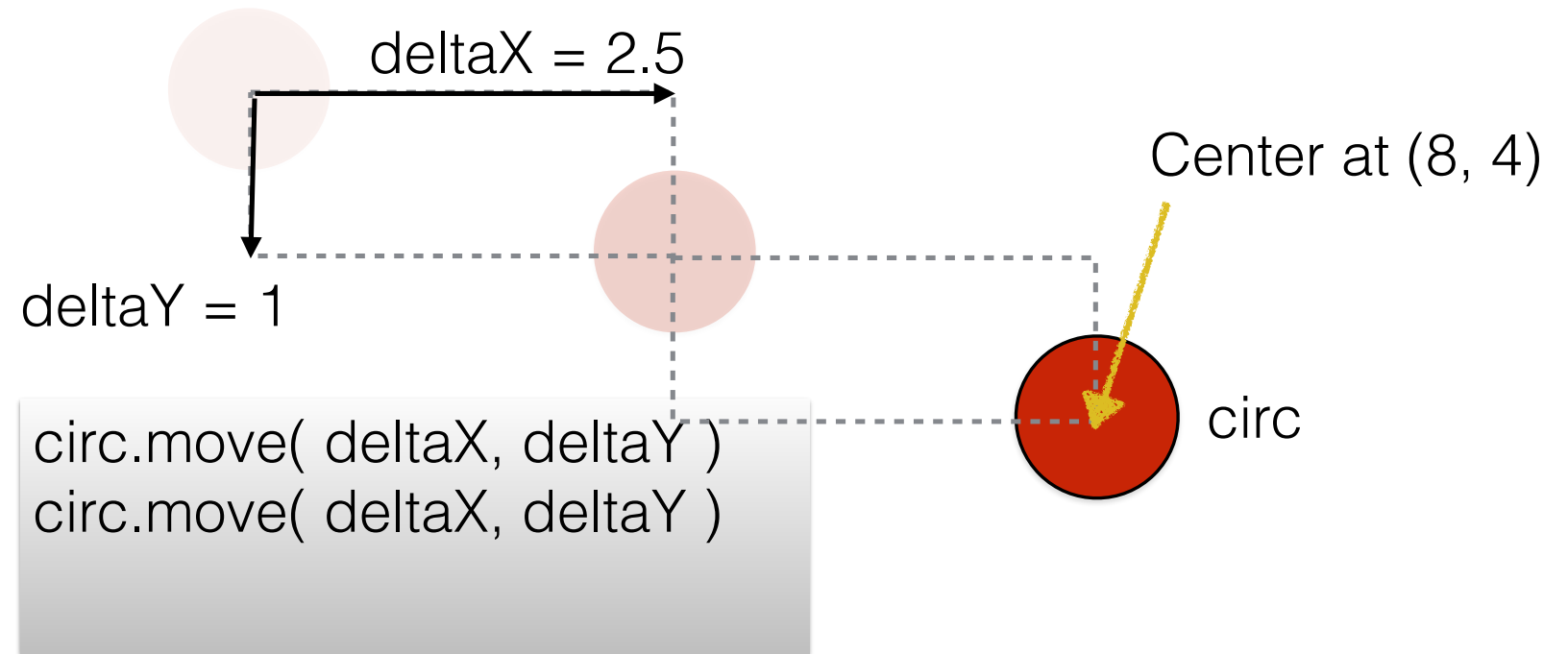
Animation: call  
`.move()`  
method >1x



```
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

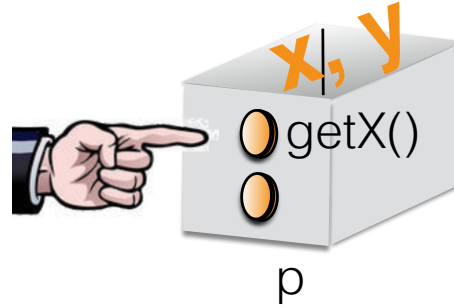
## Discussion

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

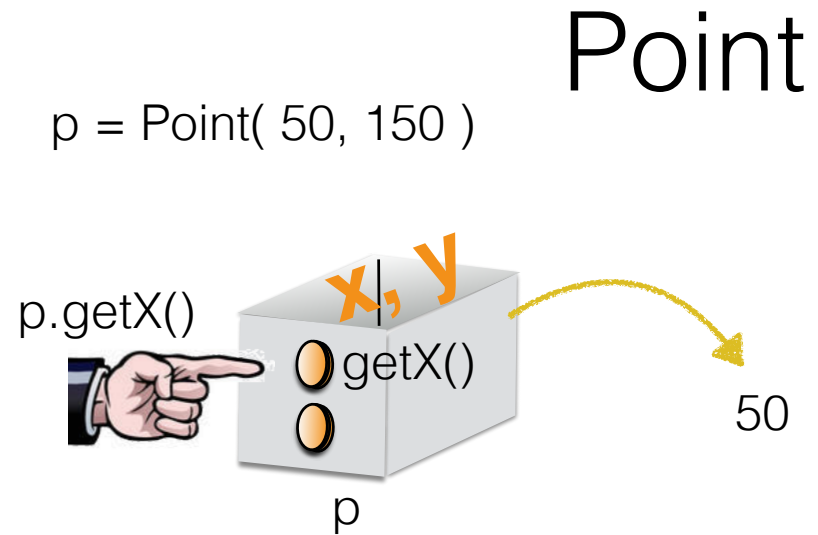
Every  
**graphics**  
element is an  
**Object...**

# Point

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



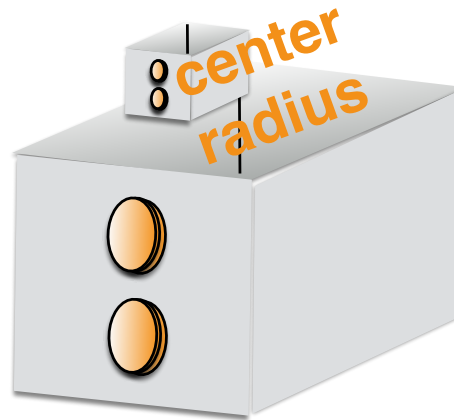
Every  
**graphics**  
element is an  
**Object...**





Every  
**graphics**  
element is an  
**Object...**

# Circle

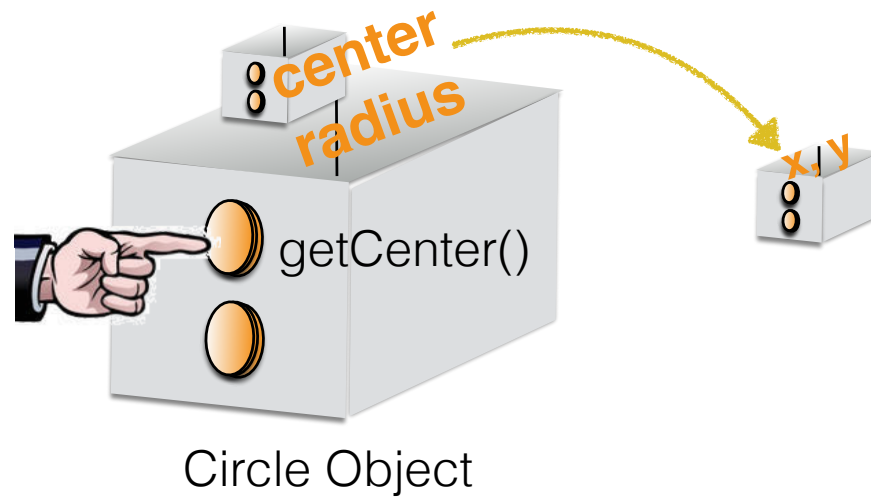


Circle Object



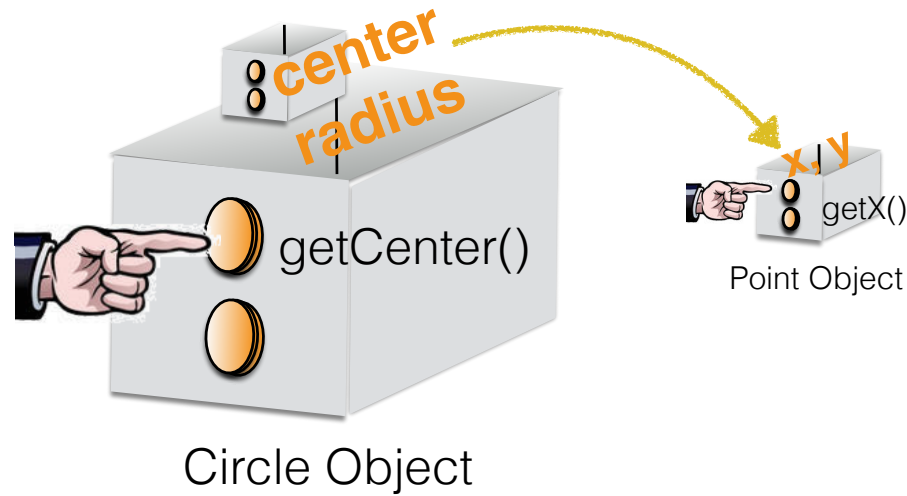
Every  
graphics  
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Object...

# Circle



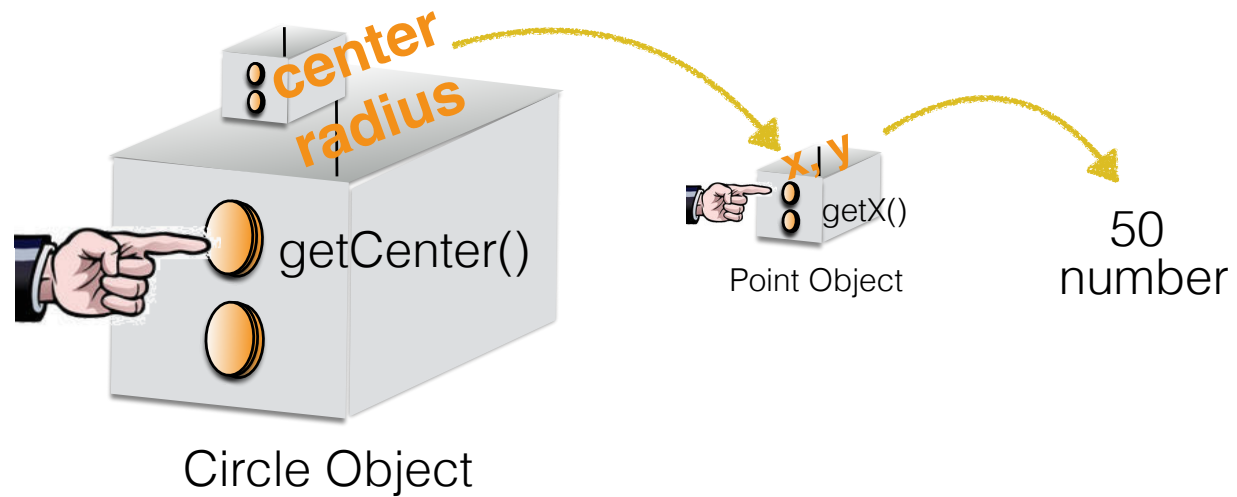
Every  
graphics  
element is an  
Object...

# Circle



Every  
graphics  
element is an  
Object...

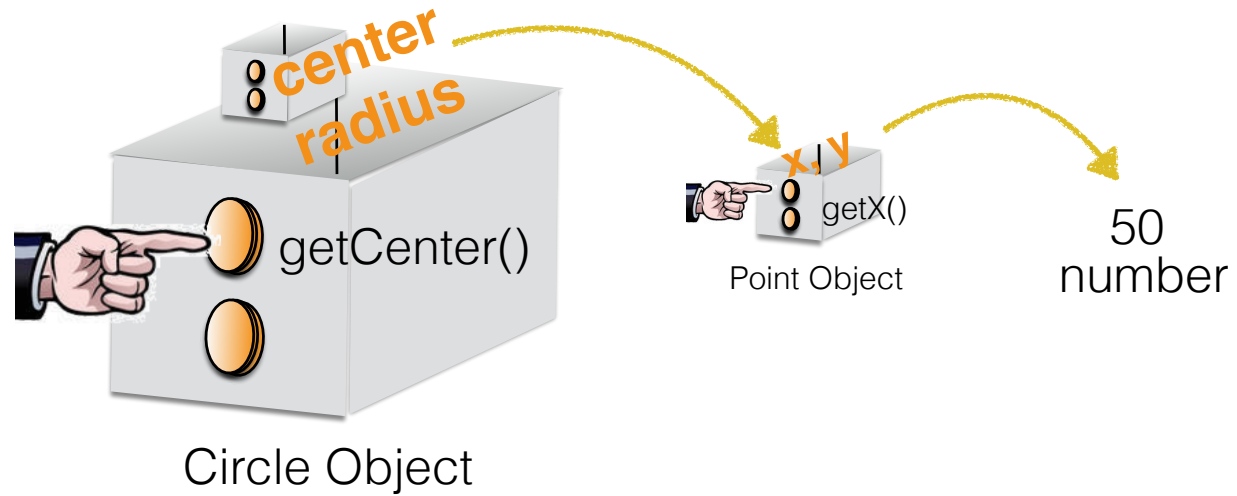
# Circle



Every  
graphics  
element is an  
Object...

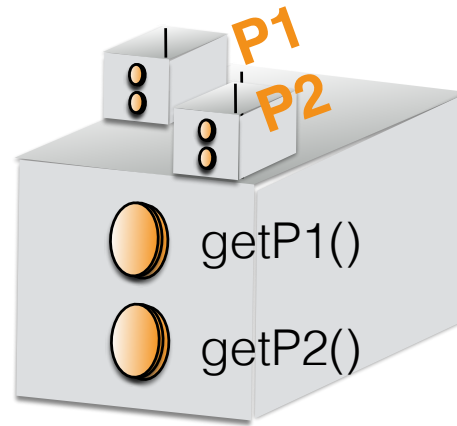
# Circle

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



Every  
**graphics**  
element is an  
**Object...**

# Rectangle

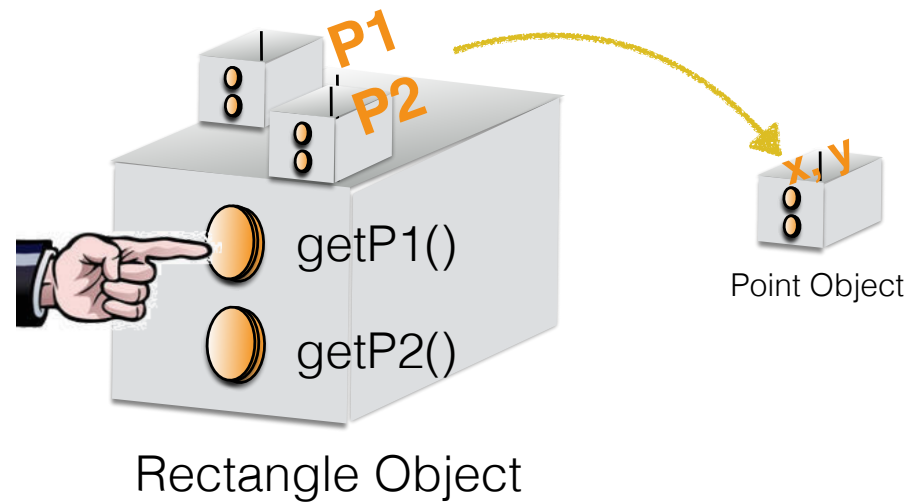


Rectangle Object



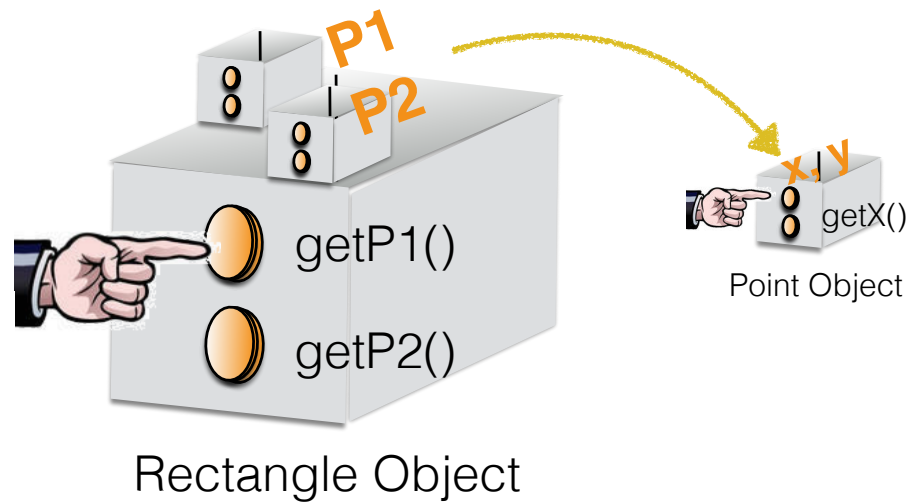
Every  
**graphics**  
element is an  
**Object...**

# Rectangle



Every  
**graphics**  
element is an  
**Object...**

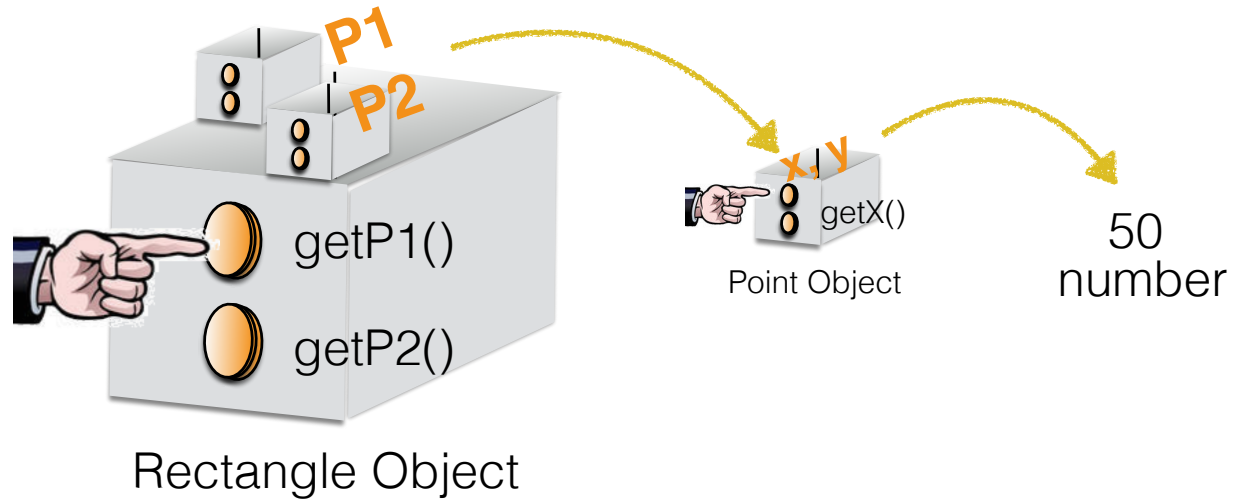
# Rectangle





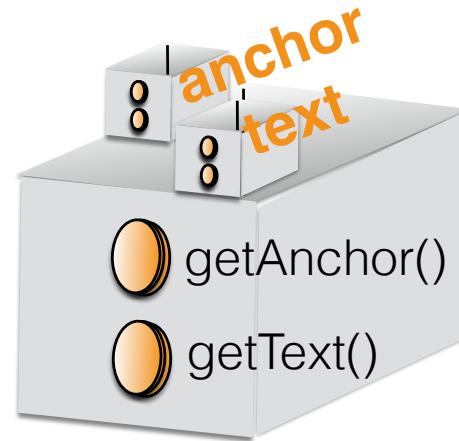
Every  
graphics  
element is an  
Object...

# Rectangle



Every  
**graphics**  
element is an  
**Object...**

## Text (label)

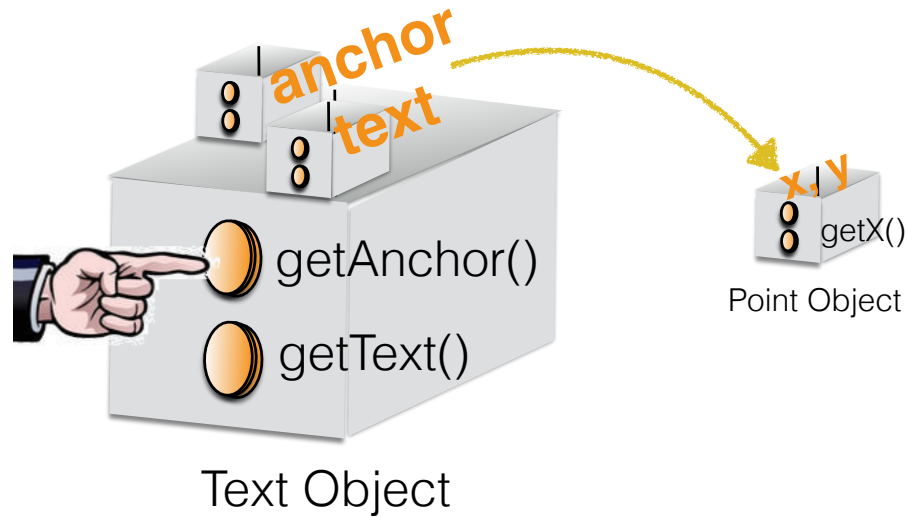


Text Object



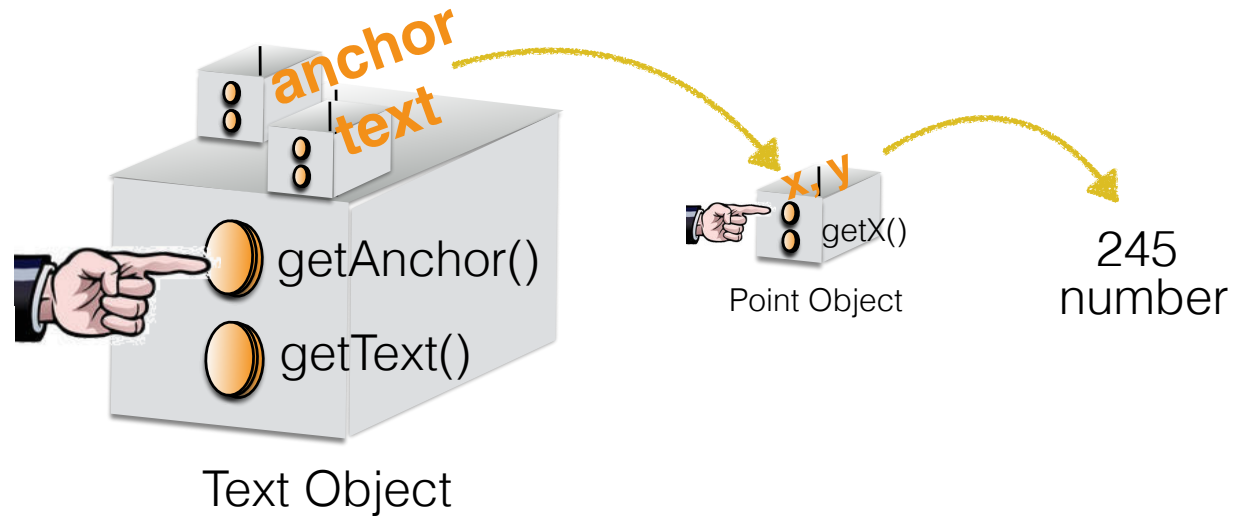
Every  
graphics  
element is an  
Object...

## 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?**

Bouncing off  
the walls

DEMO  
TIME