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

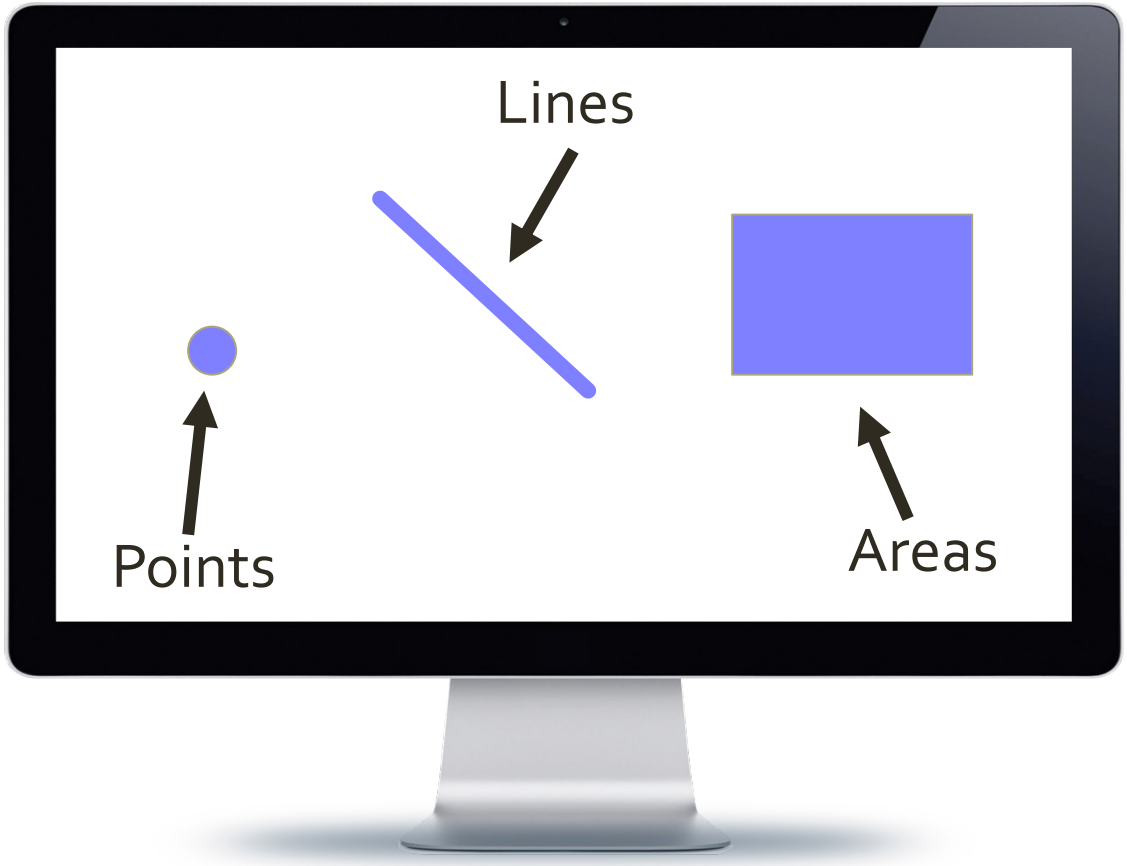
- Final Project
- Animation basics
  - understanding motion
  - the `.move()` method
  - keeping objects on the screen

Final Project

- Please read the final project instructions, if you have any questions, please ask!
- If you have not been able to make the graphics package work
  - download graphics.py from the Demos tab of the course website
  - save the file in the same folder as the python program you are writing
  - you should now be able to import graphics

- ✓ Draw stuff

"graphical primitives"

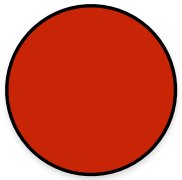


- ✓ Draw stuff

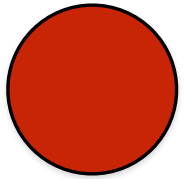
using the **`graphics`** module

2. Make it move

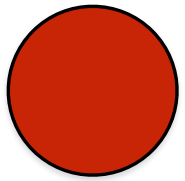
Animation basics



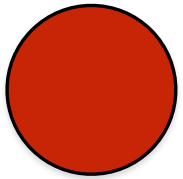
Animation basics



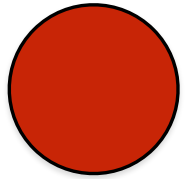
Animation basics



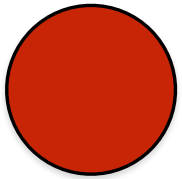
Animation basics



Animation basics



Animation basics

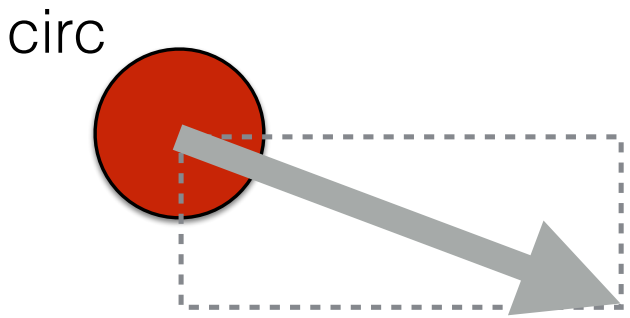


Discussion

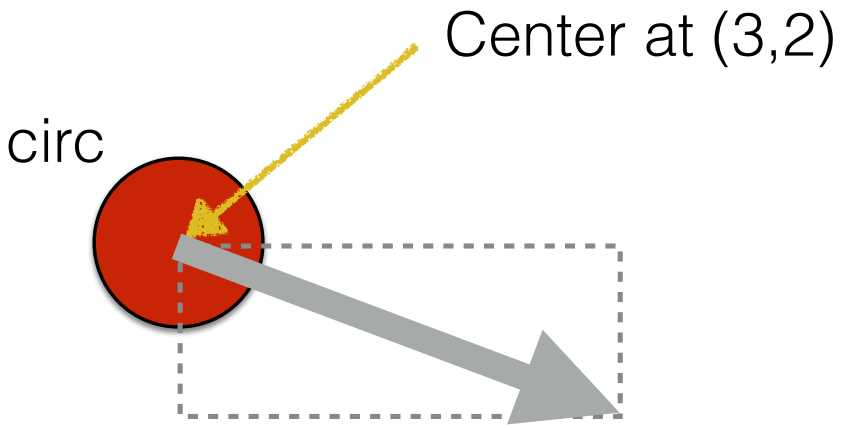
What do I need to **be able do**

to make that happen?

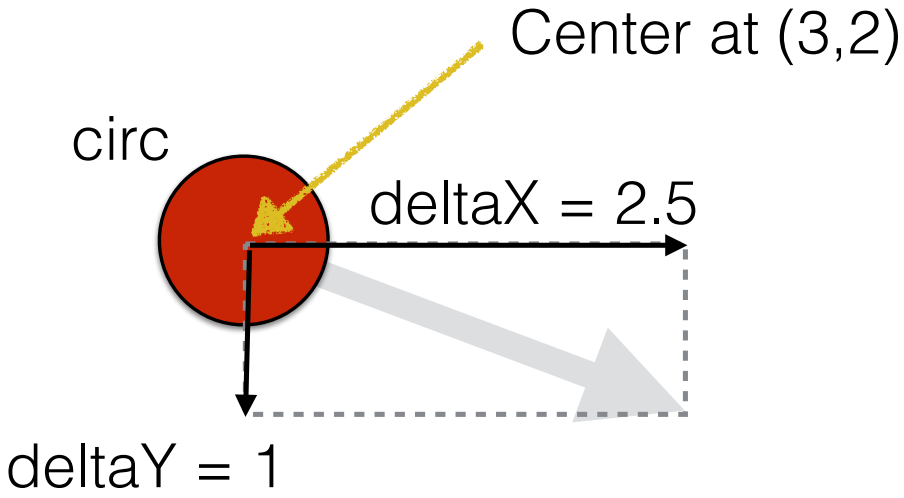
Understanding motion



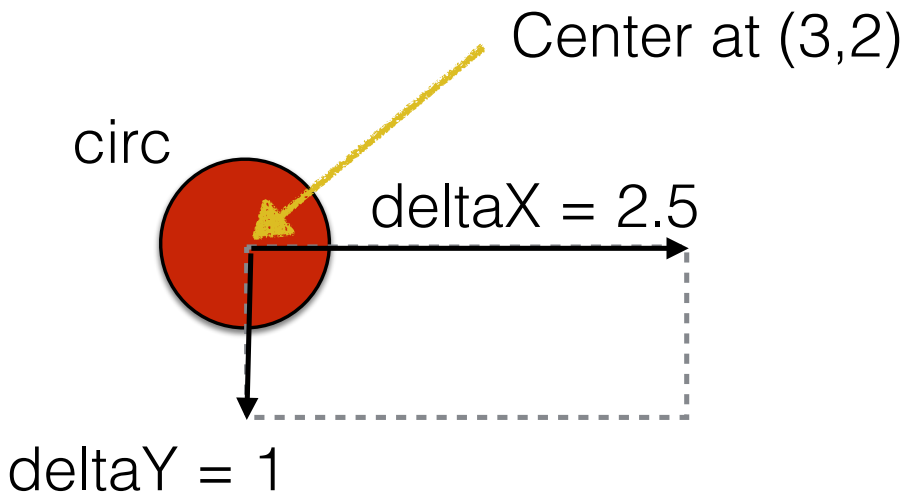
Understanding motion



Understanding motion

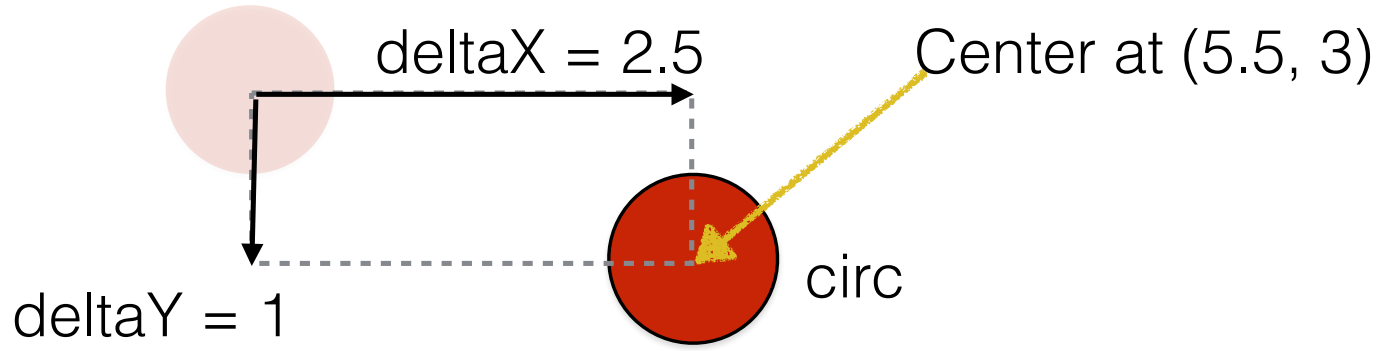


The `.move()` method



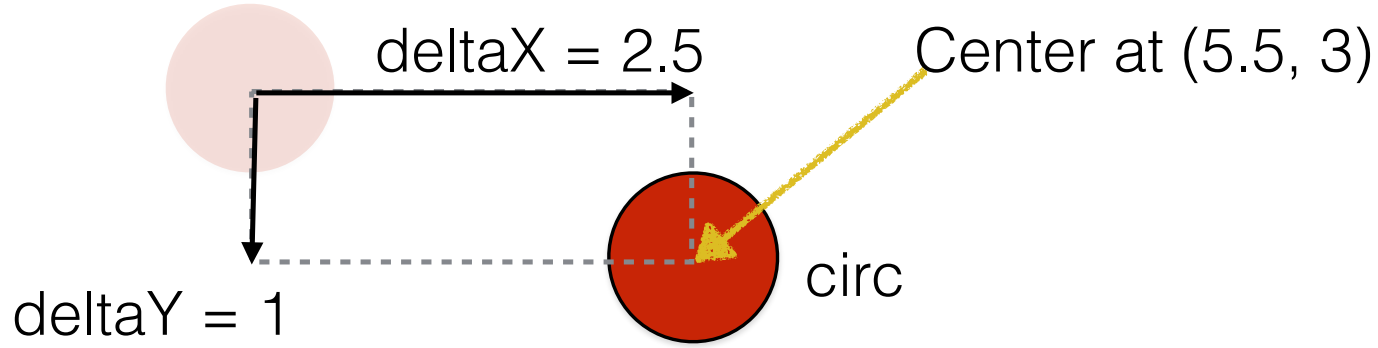

```
circ.move( deltaX, deltaY )
```

The `.move()` method



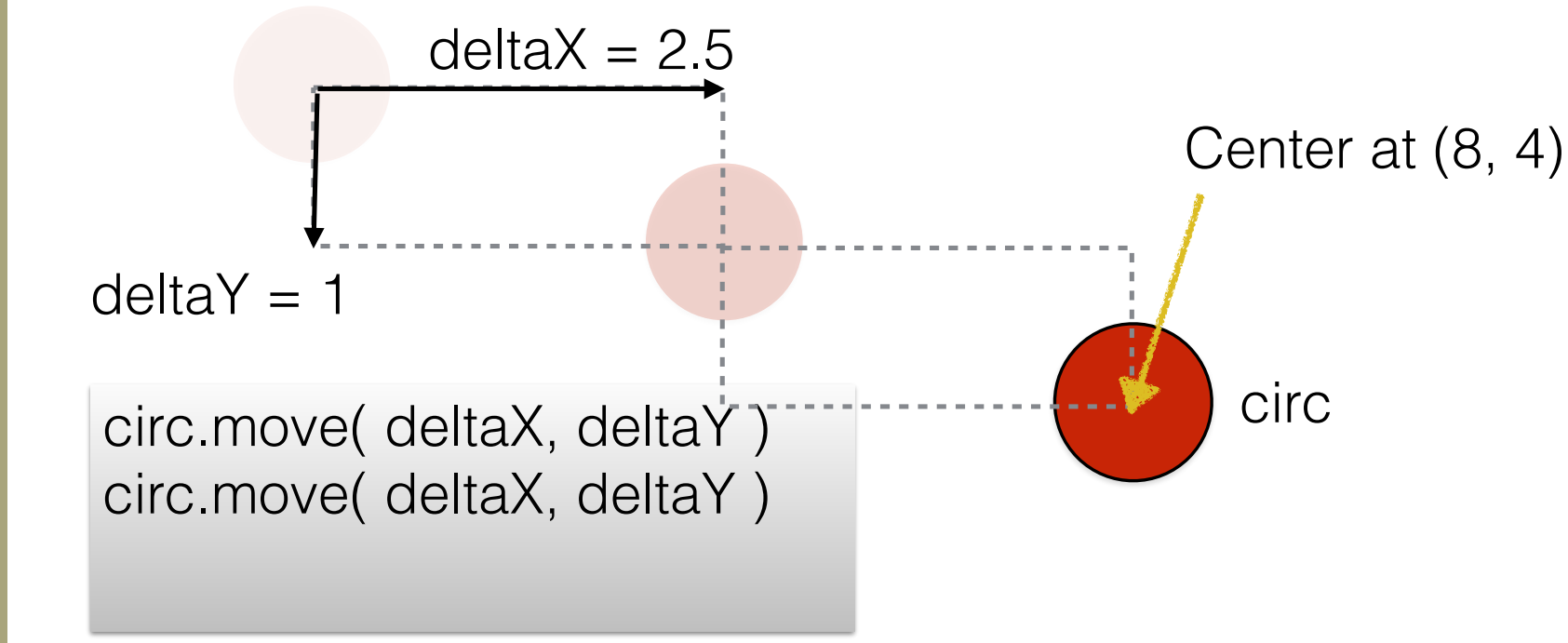

```
circ.move( deltaX, deltaY )
```

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




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

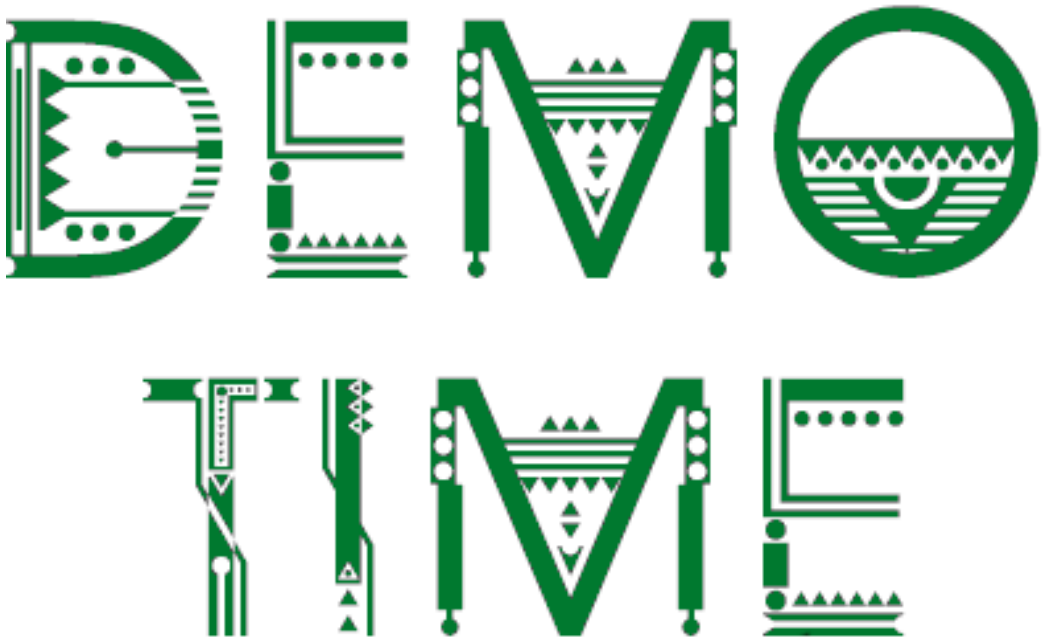
Animation: call `.move()` method >1x



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



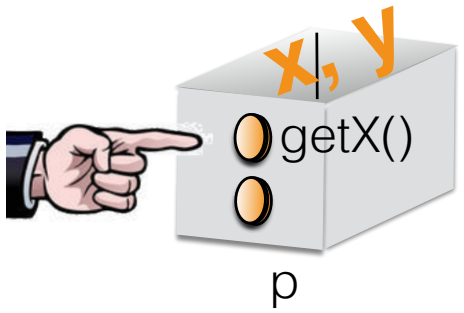
Discussion

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

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

Point

p = Point(50, 150)



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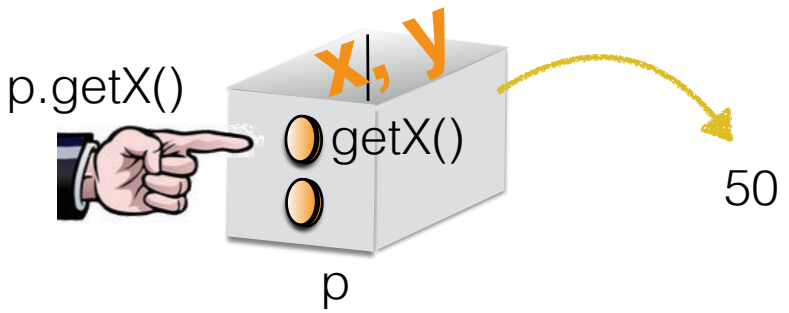
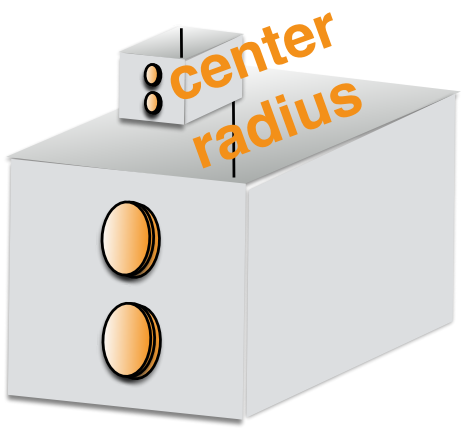


Every **`graphics`** element is an **`Object`**...

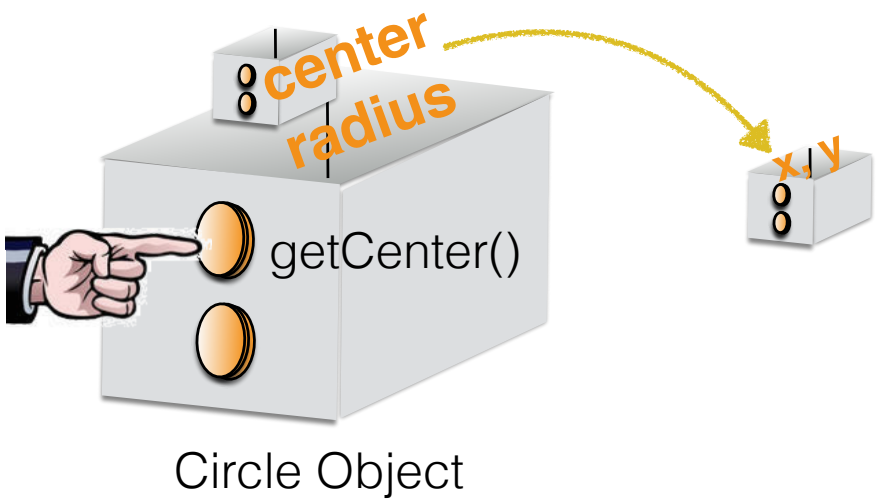
Circle



Circle Object

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

Circle



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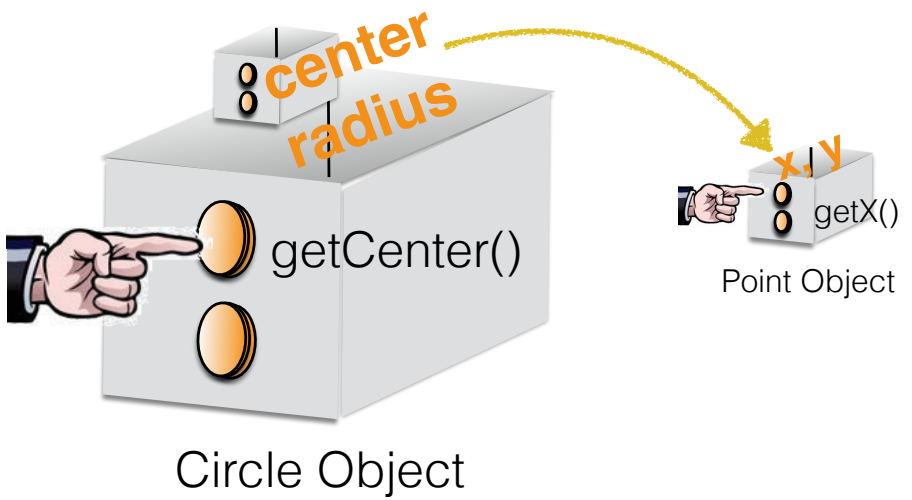

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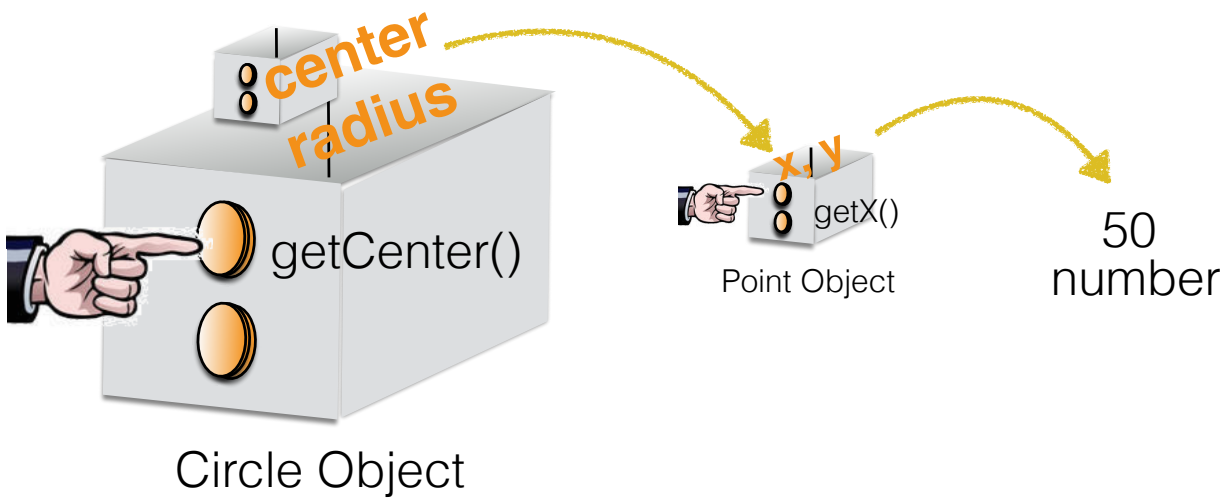

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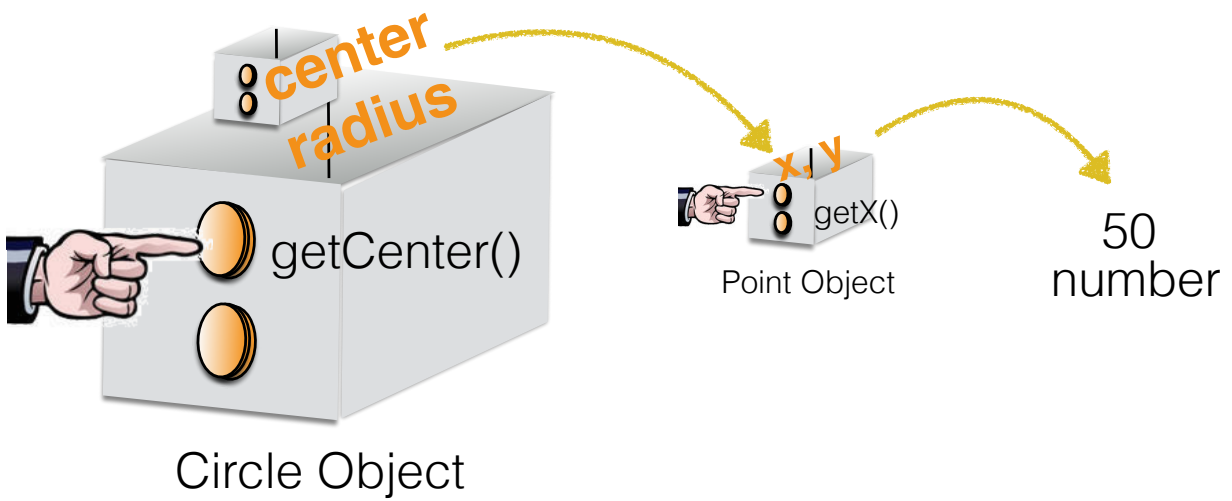
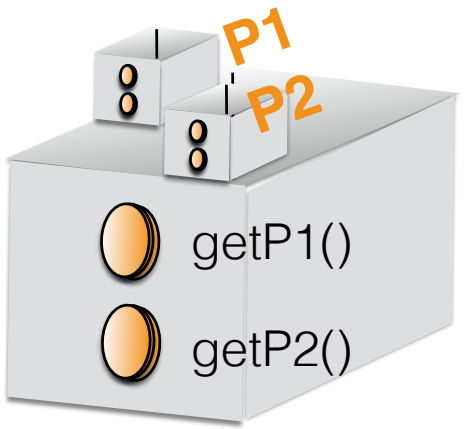
Circle

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



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

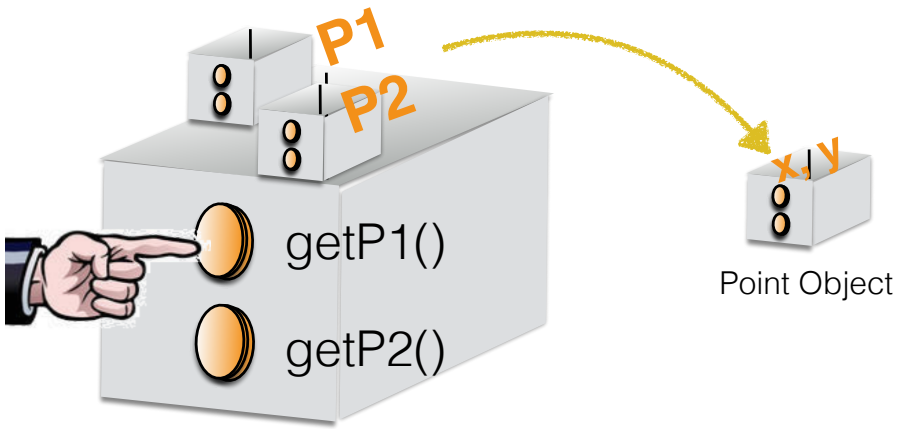
Rectangle



Rectangle Object

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

Rectangle



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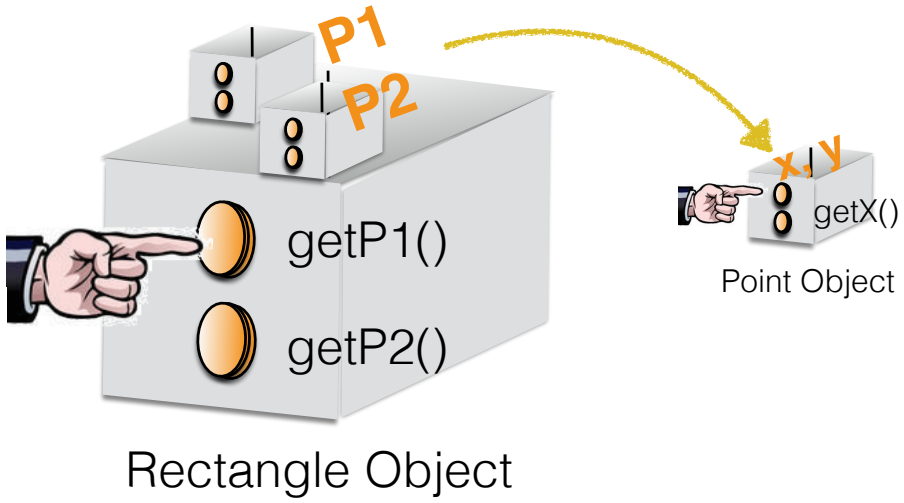

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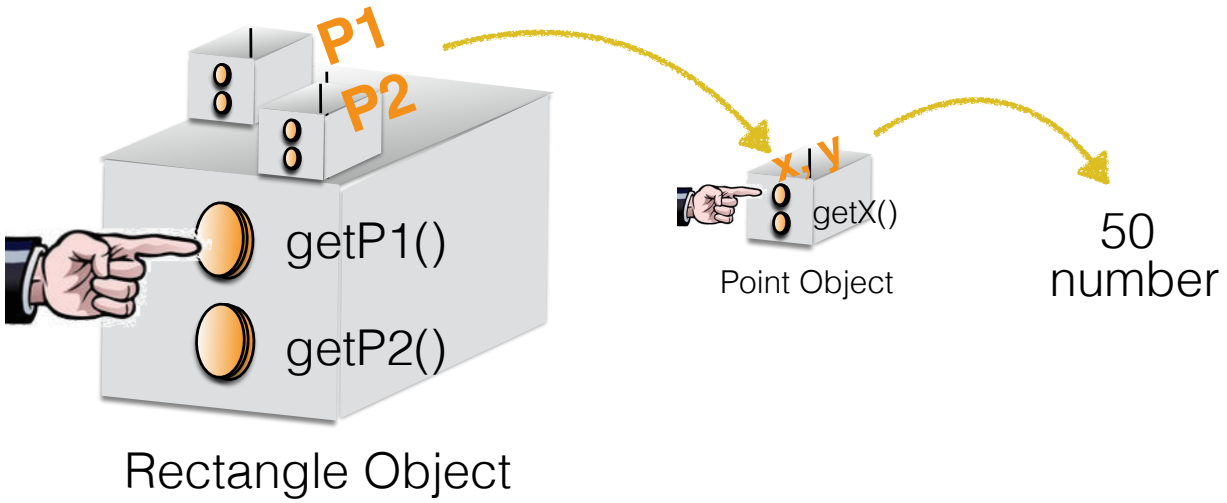
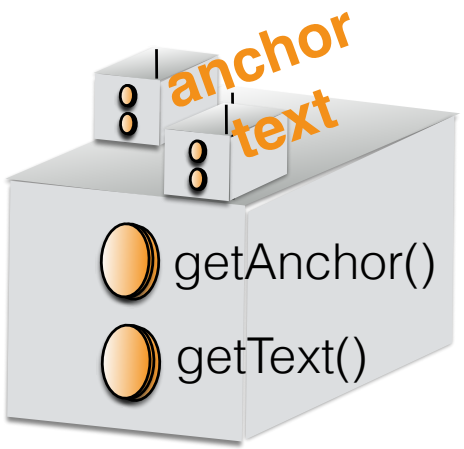


Every **`graphics`** element is an **`Object`**...

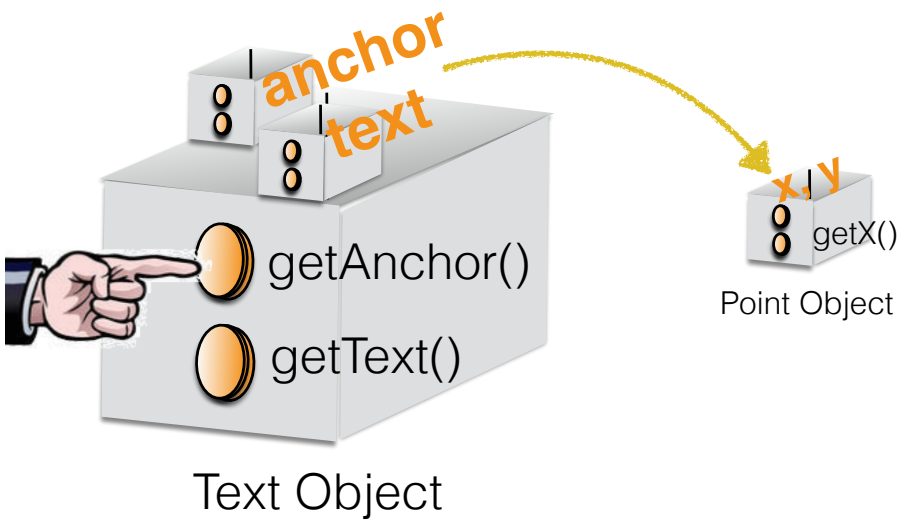
Text (label)



Text Object

Text (label)

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



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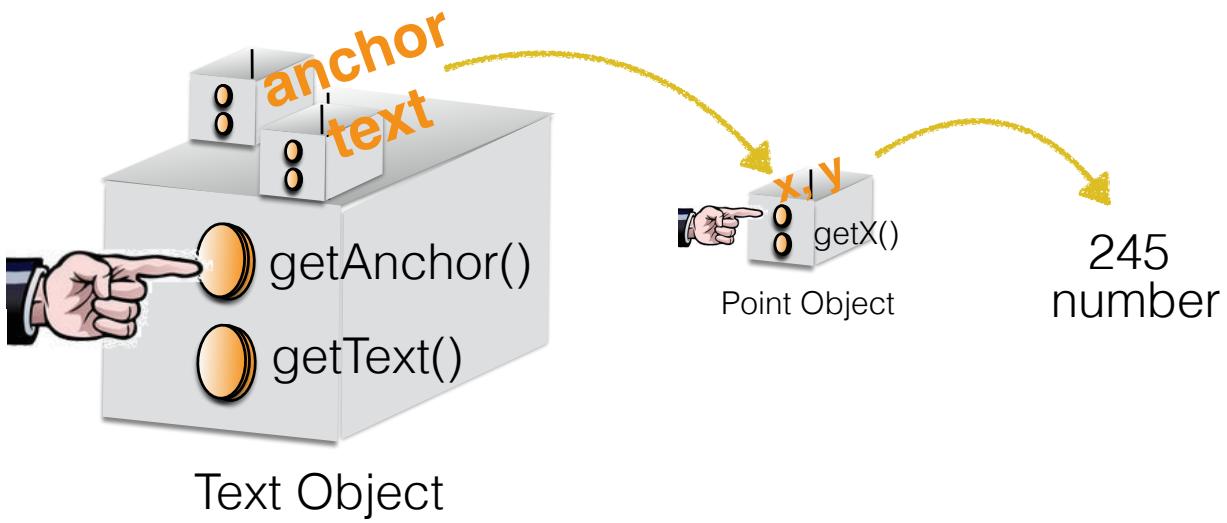
Text (label)



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