

Lesson 4

Pong

Programming Fundamentals in Python

Lesson 3 Recap

- Homework: Adventure Game
- Bonus: Airport Data Analysis

Class Materials

github.com/DavidYKay/python-fundamentals

Today's Goal

- Implement a game of Pong

Pong Demo

Breakdown

- Cocos2d
- Class / Self
- XY Coordinates
- Game Loop
- Collision Detection

Cocos2d



Cocos2d



Angry Bird Fight
what



Brave Frontier
Gumi



Clash of Kings
Elex Inc



Heroes Charge
thanks



Geometry Dash
robtogames



AnTuTu Benchmark
AnTuTu



JOJO'S BIZARRE
BANDAI NAMCO Games Inc.



三国志乱舞
SQUARE ENIX INC



ONEPIECE TREASURE
BANDAI NAMCO Games Inc.



FINAL FANTASY Record
DeNA Co., Ltd.



TALES OF ASTERIA
BANDAI NAMCO Games Inc.



Monster Strike
Mixi

What is a Game Engine?

- Graphics rendering
- Input handling
- Networking
- Physics
- Cross-platform support

Cocos2d

```
pip install cocos2d
```

Class / Self

```
class UFO:  
    def __init__(self):  
        self.position = (0,0)  
        self.velocity = (75,25)
```

Properties

```
# Create a Sprite, add it to "self" and call it "paddle."  
self.paddle = Sprite("images/paddle_a.png")  
# Existing property inside Sprite  
self.paddle.position = (0,0)  
# New property we just made up!  
self.paddle.velocity = (5,2)  
  
# What do these lines do?  
self.paddle.position = (50, 100)  
self.paddle.velocity
```

XY Coordinates



XY Coordinates

```
self.ball.position = (0,0)
```

Game Loop



Game Loop

- Handle user input
- Update Game State
- Draw to the Screen

User Input

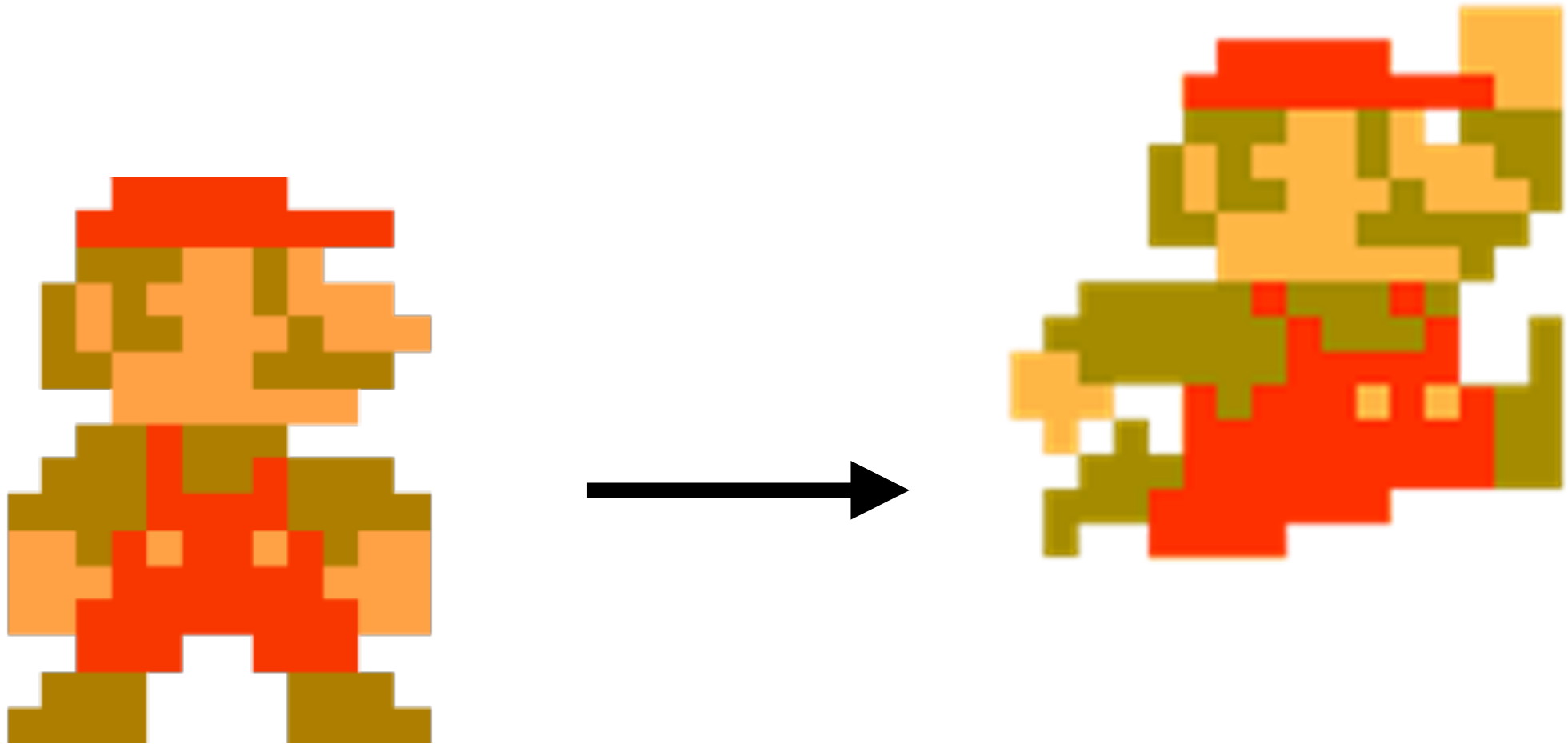


User Input

```
def on_key_press(self, key, modifiers):  
    if key == 65362:  
        # up arrow  
        print("up arrow was pressed!")
```



Update Game State

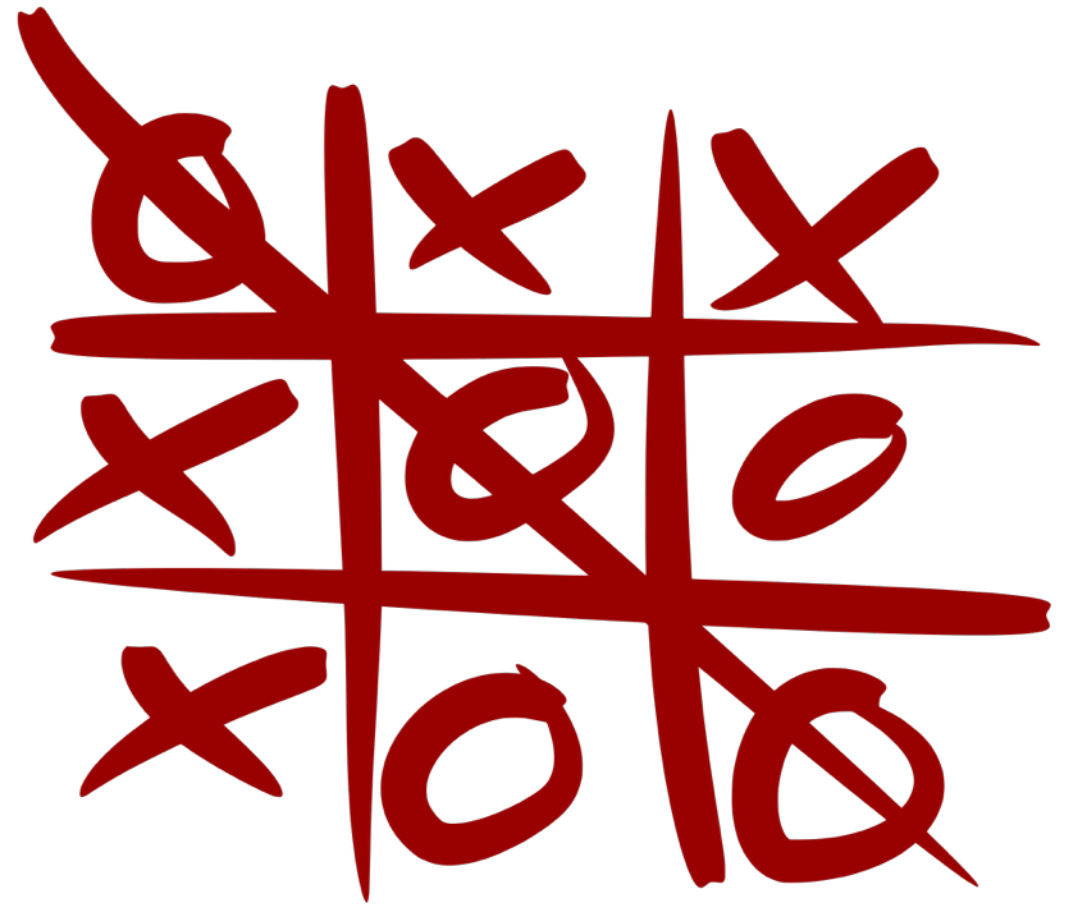


```
{position: (0,0),  
jumping: False}
```

```
{position: (0,10),  
jumping: True}
```

Draw to Screen

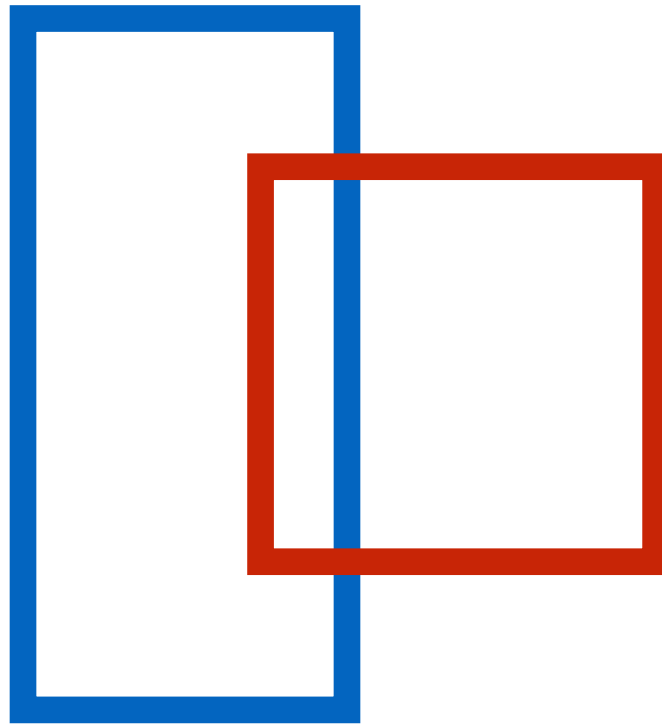
```
[ ['O', 'X', 'X'],  
  ['X', 'O', 'O'],  
  ['X', 'O', 'O']]
```



Game Loop - Cocos2d

- Handle user input - Event-driven
- Update Game State - Manual
- Draw to the Screen - Automatic

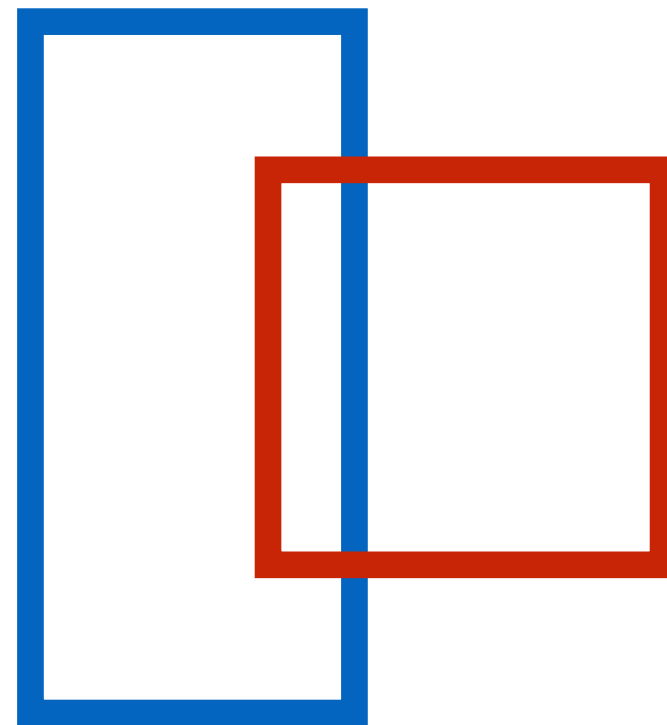
Collision Detection



Are these objects colliding?

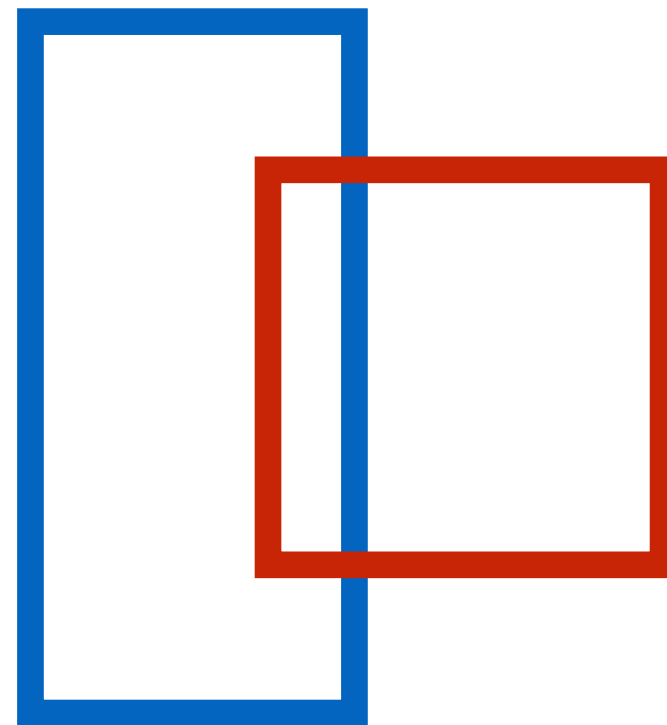
Collision Detection

- Is part of A inside of B?
- Is part of B inside of A?
- Are they not colliding at all?



Collision Detection

Hint: it's easier if you look at
one axis at a time.



Recap

- Cocos2d
- Class / Self
- XY Coordinates
- Game Loop
- Collision Detection

Homework Assignment

- Write a working Pong game
- Email it to me

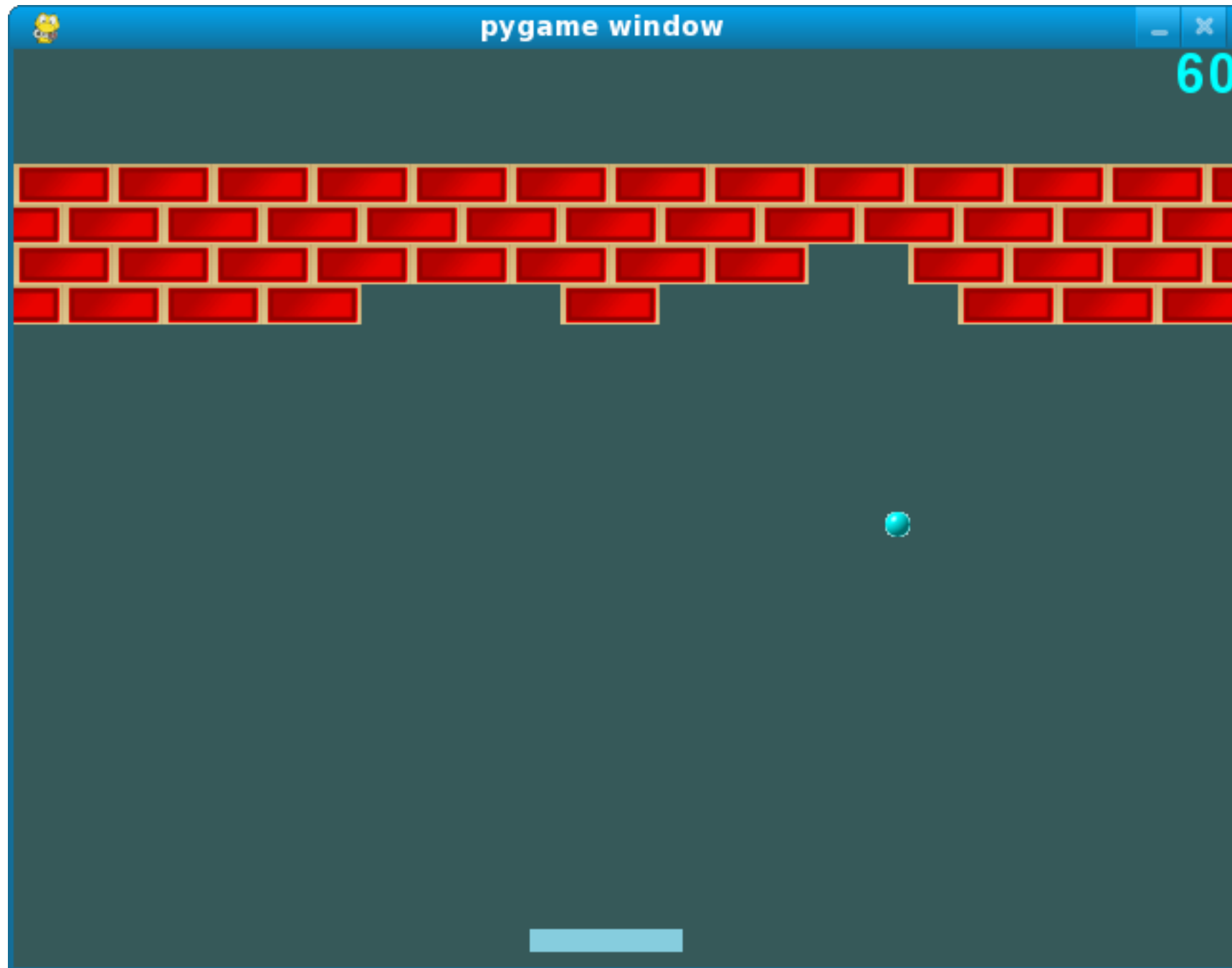
Bonus Assignment

- Modify your pong game:
 - Show each player's score on the screen
 - Change the paddle code so that hitting the ball at different points on the paddle will reflect the ball at different angles

Bonus Bonus Assignment

- Write a game of Breakout

Breakout



Next Week

Fractals!