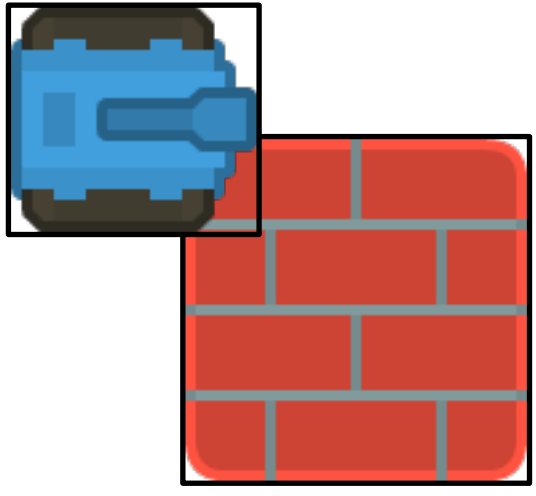
Introduction to Processing

Collision Detection

Rectangle-Rectangle Collision

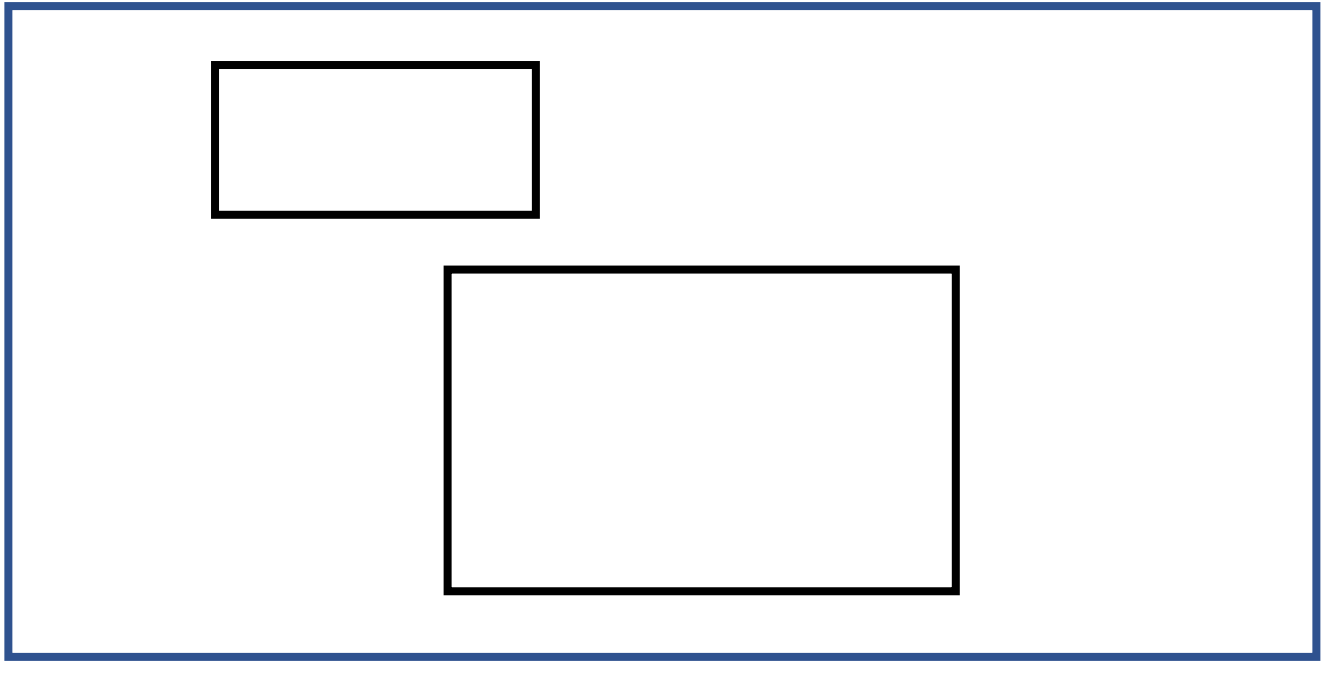
Since images are simply rectangular array of pixels, rectangle-rectangle collision is very useful for writing games.



Rectangle-Rectangle Collision

Rectangles below have a horizontal overlap but not a vertical one.

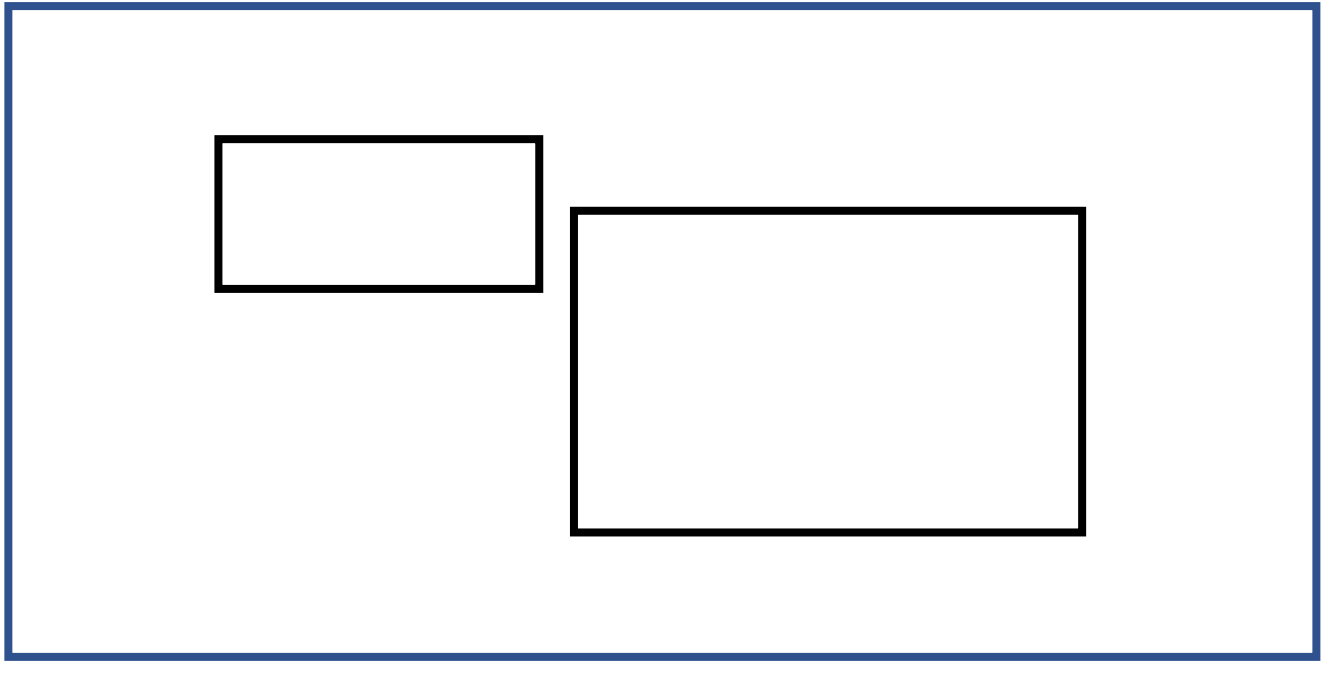
Origin (0,0)



Rectangle-Rectangle Collision

Rectangles below have a vertical overlap but not a horizontal one.

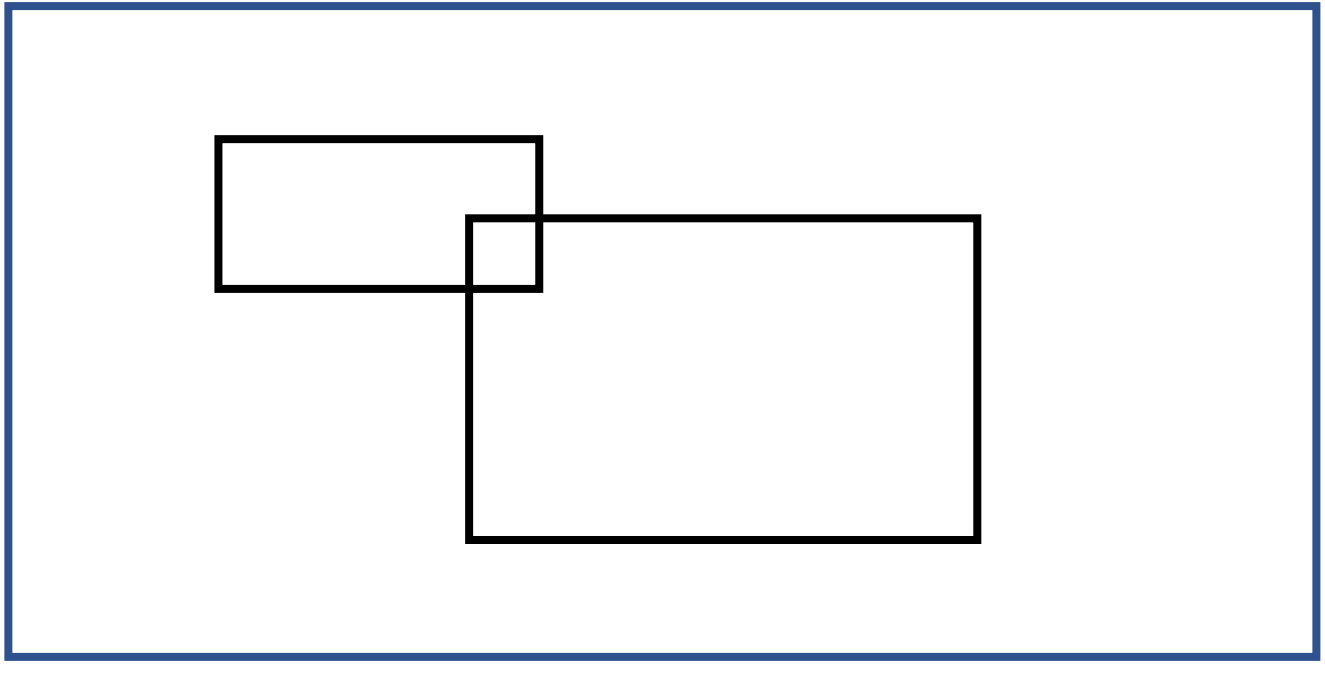
Origin (0,0)



Rectangle-Rectangle Collision

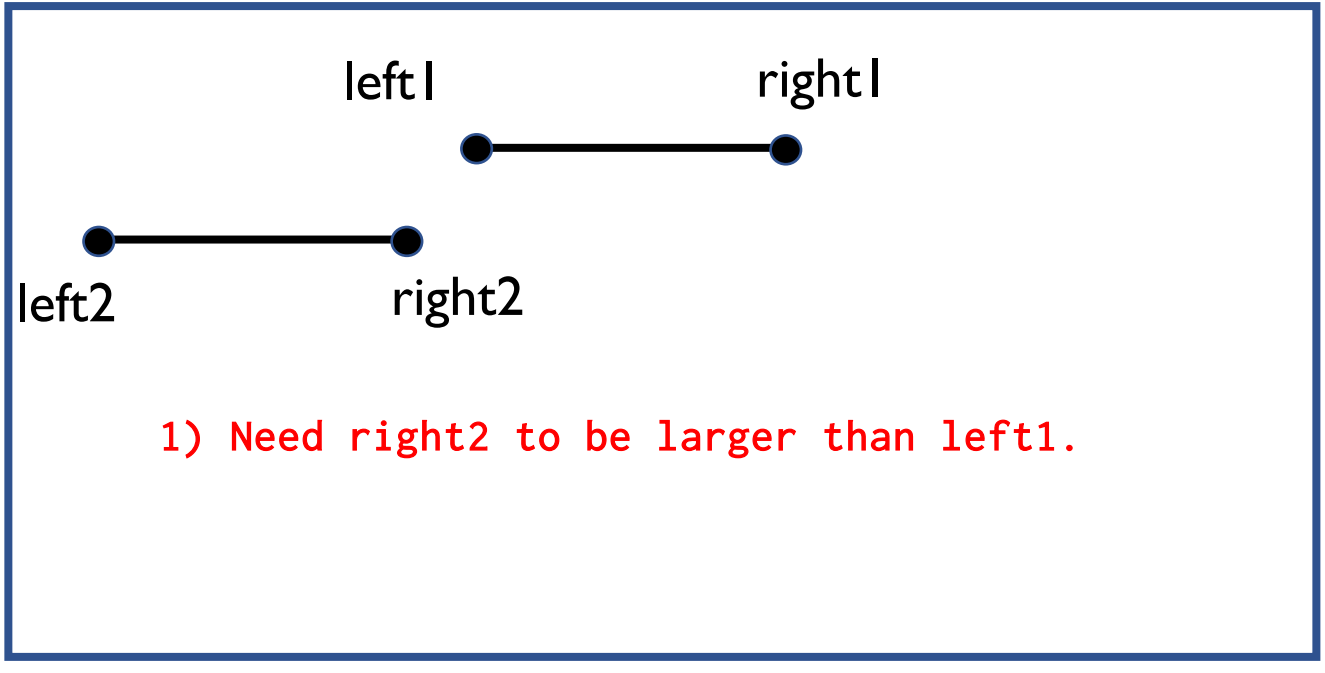
`Rectangles below have overlaps in both directions.`

Origin (0,0)



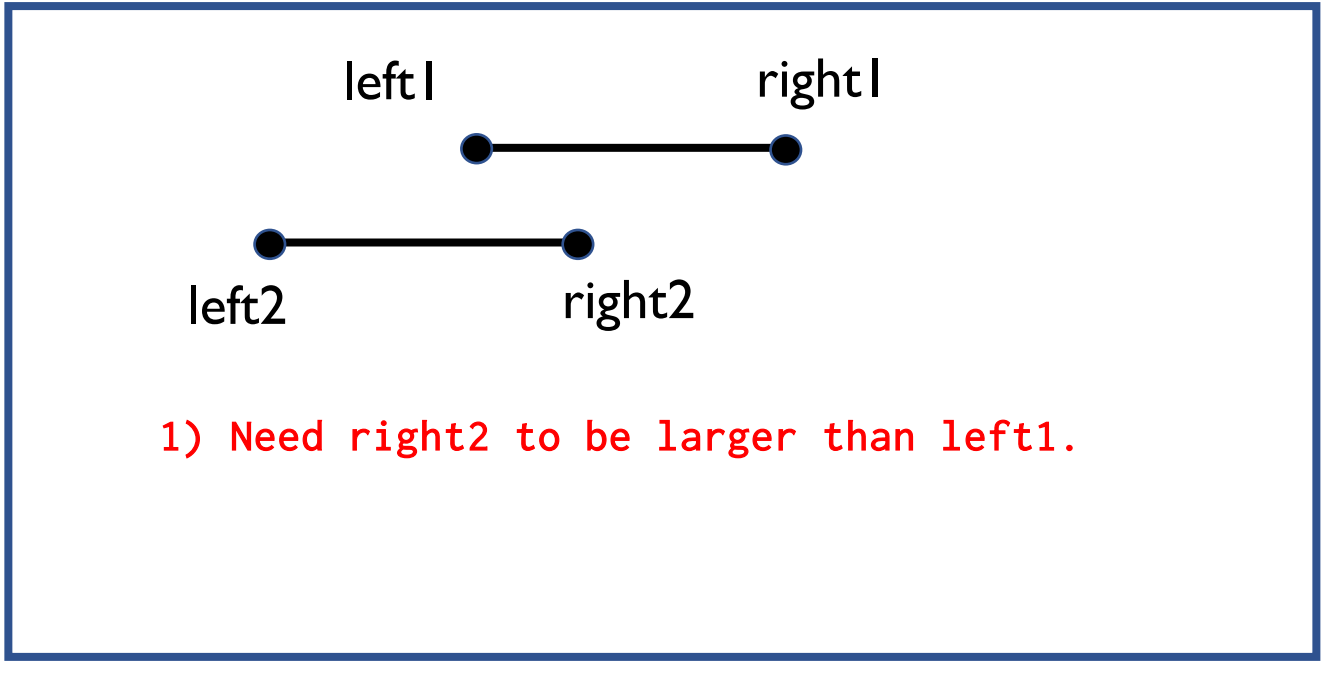
Checking Overlap

Origin (0,0)



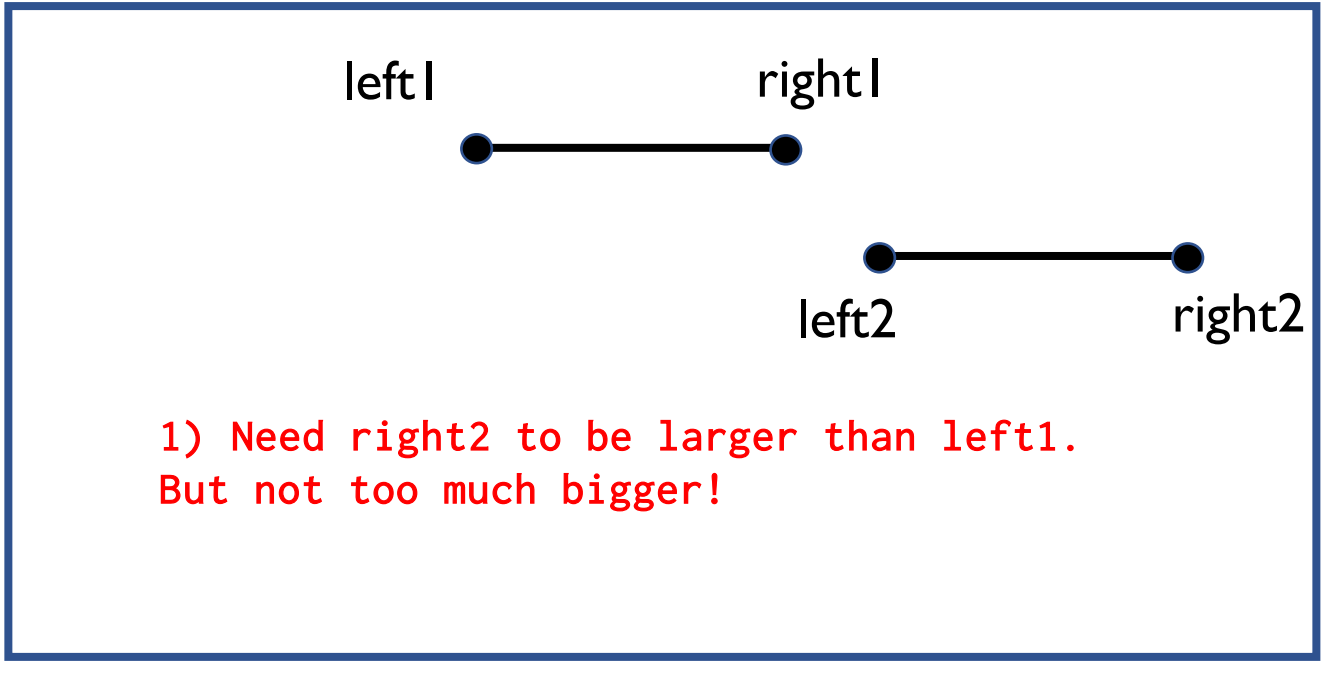
Checking Overlap

How do we check for overlap?



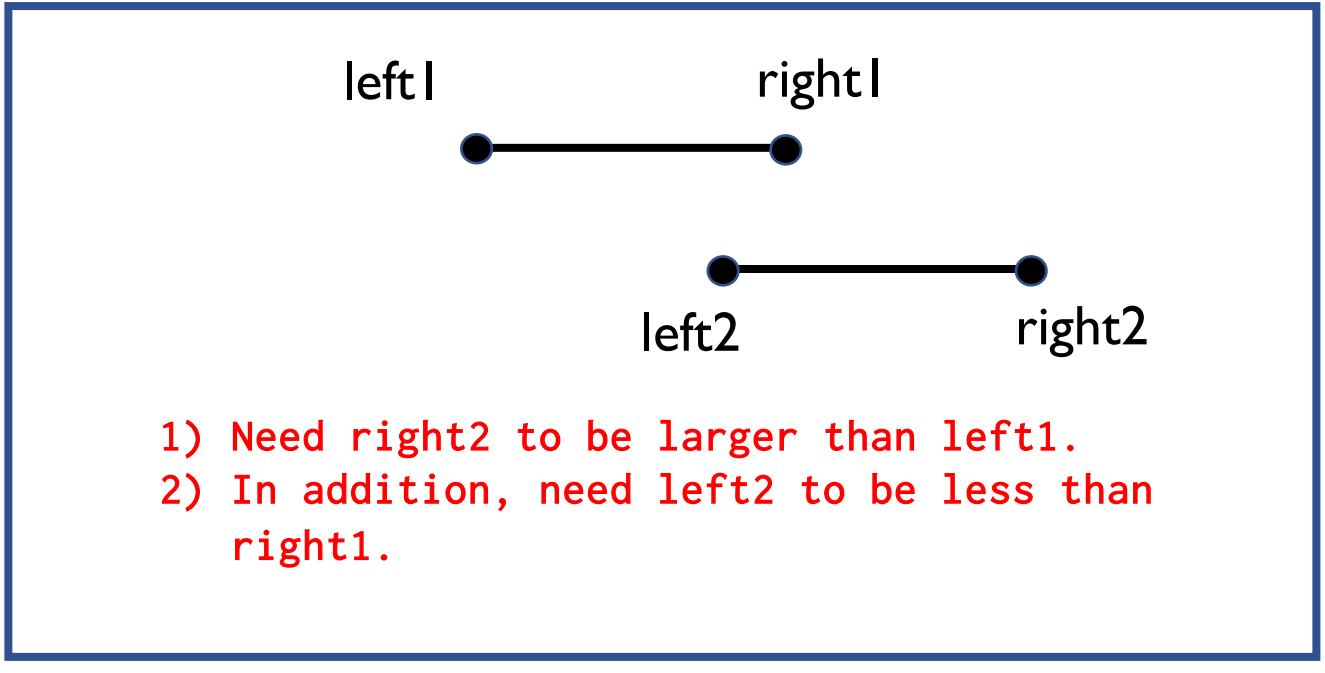
Checking Overlap

How do we check for overlap?



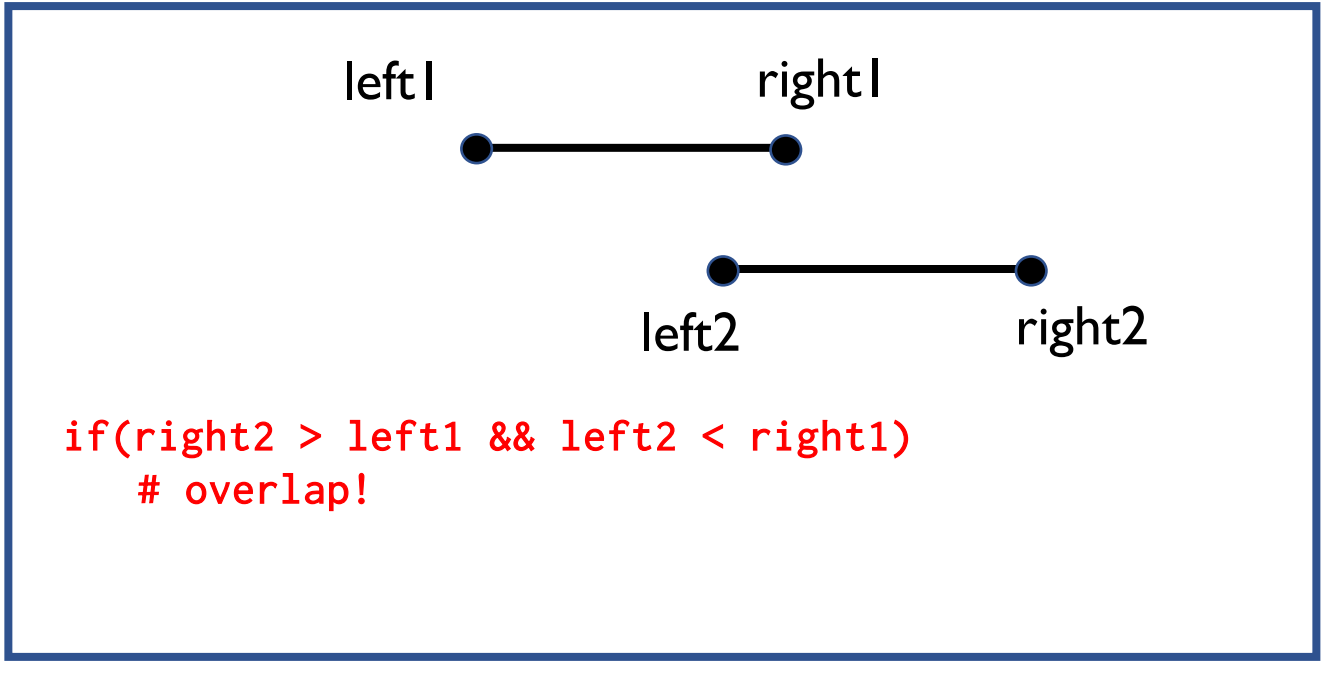
Checking Overlap

How do we check for overlap?



Checking Overlap

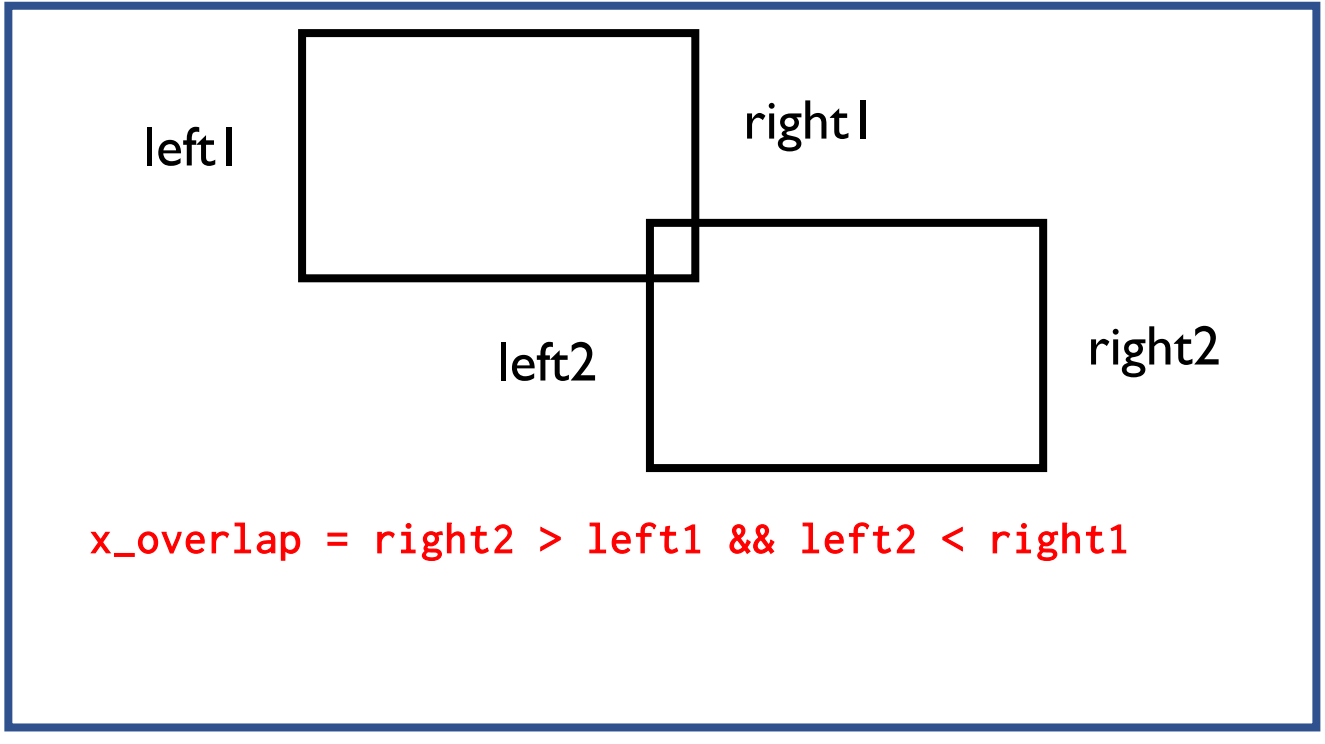
How do we check for overlap?




```
if(right2 > left1 && left2 < right1)
    # overlap!
```

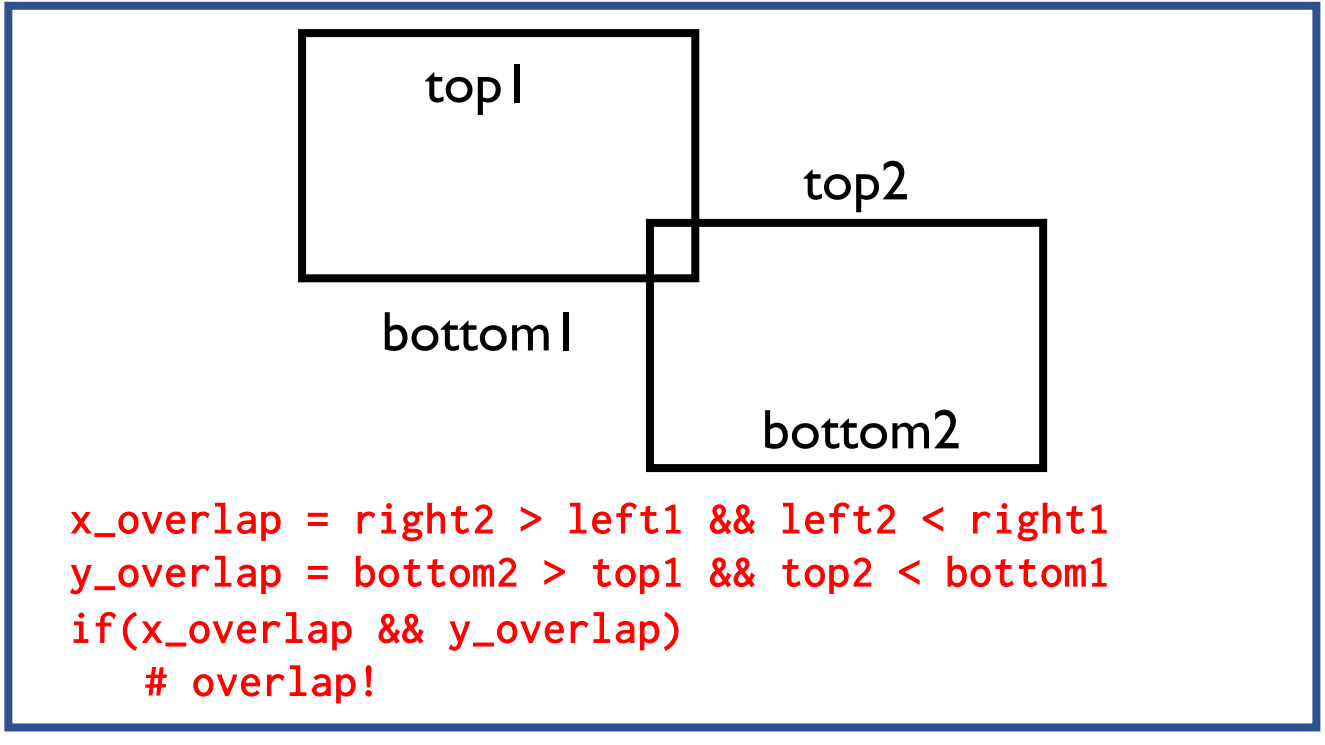
Rectangle-Rectangle Collision

Rectangles below have overlaps in both directions.



Rectangle-Rectangle Collision

Rectangles below have overlaps in both directions.

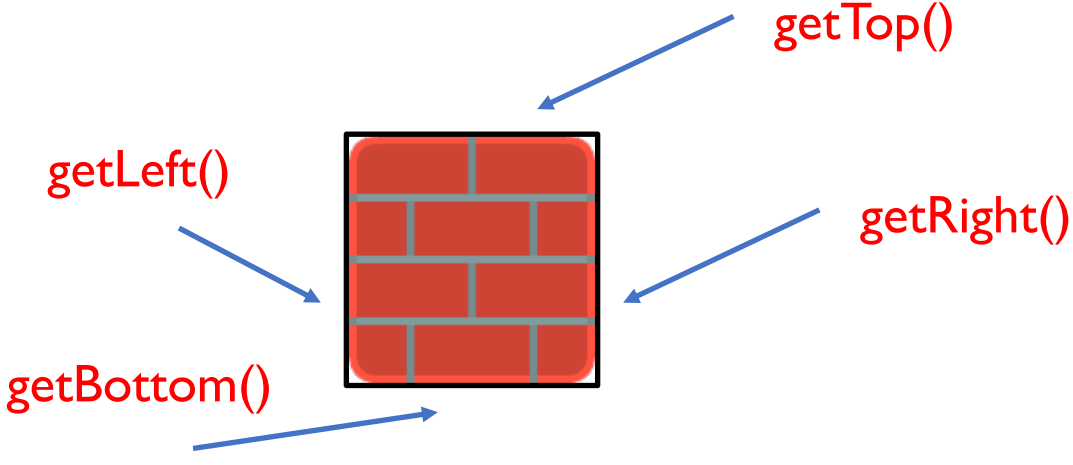



```
x_overlap = right2 > left1 && left2 < right1
y_overlap = bottom2 > top1 && top2 < bottom1
if(x_overlap && y_overlap)
    # overlap!
```

checkCollision(sprite1, sprite2)

We'll write the checkCollision method which accepts two parameters: sprite1 and sprite2 and returns whether they intersect.

Use the getLeft, getRight, getTop and getBottom methods to get the respective boundaries of the sprite!



checkCollisionList(sprite, sprite_list)

Another useful method is the checkCollisionList which accepts two parameters: `sprite` and `sprite_list` and returns a list of sprites in `sprite_list` which intersects with `sprite`.

This method calls checkCollision.

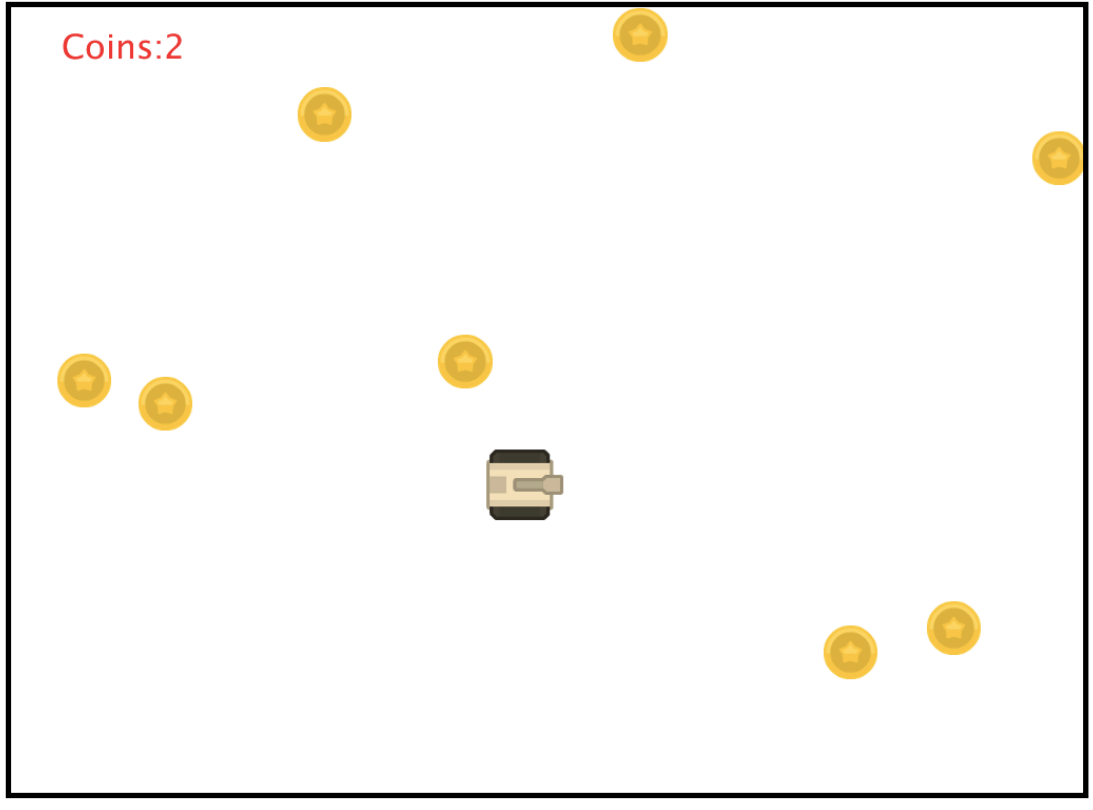
Pick Up Coins Lab

In the previous lab, you are now able to control a sprite with the keyboard.

In this lab, implement checkCollision and checkCollisionList. Then implement draw() so that as the tank moves about, it picks up coins and coins are removed from the screen appropriately.

Display the text which shows the coin count. For example, "Coins: 10" and update appropriately.

A template for this lab with comments explaining the lab is available on my website here.


Coins:2