# GD PY 3

Let's review the fundamentals before moving on. This is a Prove Yourself ( PY ). It allows you to showcase all of the topics that you have learned so far. You can use any of the previous projects ( website and curriculum ) that you have completed to help complete this PY.

The Sensei can give hints and minimal help because the goal of a PY is to have the student showcase their own unique solution to the problem. **GD 1 and 10 is a good reference point.**

---

1. **Hit box**

A very important part of game development is collision detection. We have to determine if two game objects have invaded each other's space. One simple way to implement collision detection is to use is the hit box calculation.

Remember that a hit box is a square border that defines the personal space of a game object.

In order to implement collision detection, we have to check if the (x,y) position of a game object ***is within the hit box*** of a different game object.

a. If true, then change the direction of the bounce of the variables `cXDir` and `cYDir.` You can do this by multiplying both variables by -1.

The website has a paddle on the right and a ball. The ball moves to the right and the paddle moves up and down using the 'o' and 'l' key.

**Your goal is to write the code to detect collision between the ball and the paddle**. The text in red above is your hint. **Look for the green banner below and write the code under the green banner**

```
/* ==================================
* Hit Box Code Below
* ================================== */
```

## CONTINUE TO THE NEXT PAGE

2. **Loopy – You can write the solution inside the chat**

Another very important part of game development is to redraw every game object every 16 milliseconds. Assume that an array named `circleArr` already exists

Your goal is to write a `for` loop that will redraw the circles found within the array. However, we only want to redraw the circles that are in **odd numbered positions only**

1. Create a digital key named `c`
2. What is the starting position?
3. What is the ending position?
4. How much do we jump by?