COMP1021
Introduction to Computer Science

# The Coordinate System

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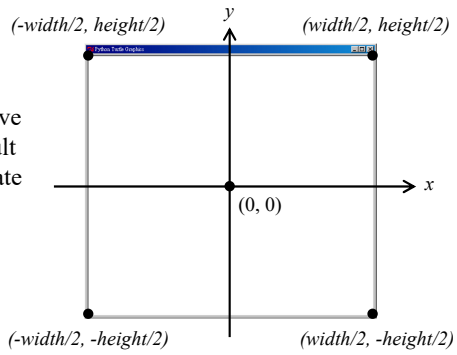
# Outcomes

- After completing this presentation, you are expected to be able to:
  1. Change the turtle coordinate system
  2. Design an appropriate coordinate system to help with a specific task



# The Turtle Coordinate System

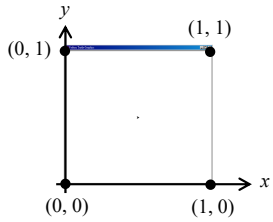
- So far, you have used the default turtle coordinate system:






# Changing The Coordinate System

- However, you can change the coordinate system to anything you like
- For example, you could have (0, 0) in the bottom left corner and (1, 1) in the top right corner:




- The ability to change the coordinate system can make it easier to do some programming tasks



# Changing The Coordinate System

- You set up the coordinates like this:

*Minimum x* *Maximum x*

```
turtle.setworldcoordinates(0, 0, 1, 1)
```

*Minimum y* *Maximum y*

- Usually this command goes at the top of the program, before you start doing things with the turtle system



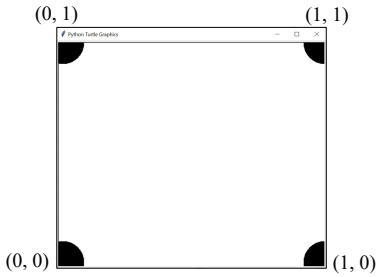
# Example – Showing the Corners

```
import turtle
turtle.setworldcoordinates(0, 0, 1, 1)
```

*turtle.dot() is a bit strange, it only uses pixels for the radius*

```
turtle.up()
turtle.goto(0, 0)
turtle.dot(100)
turtle.goto(0, 1)
turtle.dot(100)
turtle.goto(1, 1)
turtle.dot(100)
turtle.goto(1, 0)
turtle.dot(100)

turtle.done()
```




A circle is drawn at each corner

# Example – Drawing a Chart

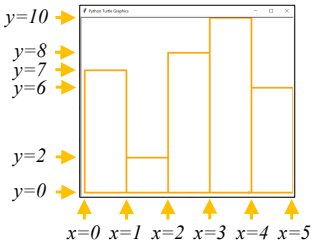
```
import turtle

def draw_rectangle(height):
    for _ in range(2):
        turtle.forward(1)
        turtle.left(90)
        turtle.forward(height)
        turtle.left(90)

values=[7, 2, 8, 10, 6]
turtle.setworldcoordinates( \
    0, 0, 5, 10)
turtle.color("orange")
turtle.speed(0)
turtle.width(5)

for x in range(len(values)):
    turtle.goto(x, 0)
    draw_rectangle(values[x])

turtle.done()
```




A series of rectangles is drawn