

# Lesson 2

## Turtle Drawing

We can create cool images and graphics in Python using a module called turtle - a set of ready-made functions designed for drawing shapes and lines.

A turtle is like a cursor that moves around your screen, leaving a line behind it. Turtles can draw all kinds of shapes and pictures - you just need to give them the right commands.



## Drawing a Circle

Firstly, we are going to draw a simple shape (a circle) using the turtle module.

- Import the turtle module.

```
import turtle
```

- Make a turtle and load it into a variable.

```
tina = turtle.Turtle()
```

We have named the turtle Tina, however, you can give the turtle any name you want.

- Set the colour that the turtle will use to draw the shape.

```
tina.color('blue')
```

- Set the style of the turtle with a function called shape.

```
tina.shape('turtle')
```

- Set the turtle's speed, choosing a number between 1 and 10 (10 is the fastest).

```
tina.speed(10)
```

- Set the thickness of the line your turtle will draw.

```
tina.pensize(4)
```

- Now, tell your turtle to draw a circle.

```
tina.circle(60) # draws circle with radius of 60 pixels
```

**Tasks:**

1. Save and run the code above.
2. Fill the inside of the circle with a colour (same colour as the outline).

```
tina.fillcolor('blue')  
tina.begin_fill()  
tina.circle(60)  
tina.end_fill()
```

3. Fill the inside of the circle with a different colour (different colour as the outline).

## Drawing a Square

We are now going to draw a square using the turtle module.

- Set up the turtle like we did in the last section (import module, make turtle, set color, set speed etc.)
- Now, tell your turtle where to go.

```
tina.forward(50) # go right 50 pixels
tina.right(90)   # turn right 90 degrees
tina.forward(50) # go down 50 pixels
tina.right(90)   # turn right 90 degrees
tina.forward(50) # go left 50 pixels
tina.right(90)   # turn right 90 degrees
tina.forward(50) # go up 50 pixels
```

### Tasks:

1. Save and run the code above.
2. Fill the square with a colour.
3. Change the code to draw a triangle.
4. Change the code to pentagon (has five sides)

**Hint:** In order to calculate the amount of degrees you must turn to draw a certain shape, use the following formula:

$$\text{Number of degrees} = 360 \div \text{Number of sides in shape}$$

## Drawing Location

Sometimes we may wish to move the turtle before we start drawing something so we can draw shapes in different locations on the screen.

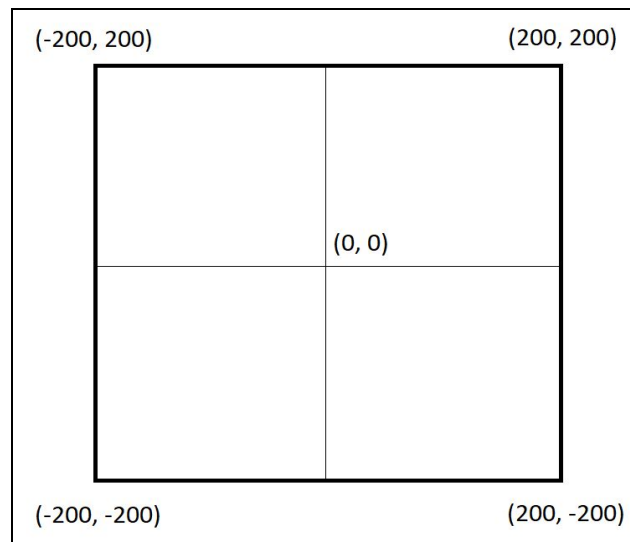
- Set up Tina the Turtle.
- Take the pen up off the page so Tina does not draw lines while moving to a different location.

```
tina.penup()
```

- Tell Tina to go to a particular point on the screen by telling her the x-coordinate and the y-coordinate.

```
tina.goto(30,-150) # x, y
```

**Note:** The screen has coordinates that go from -200 to 200 in the x and y direction.



- Put the pen back down on the screen so Tina can start drawing.

```
tina.pendown()
```

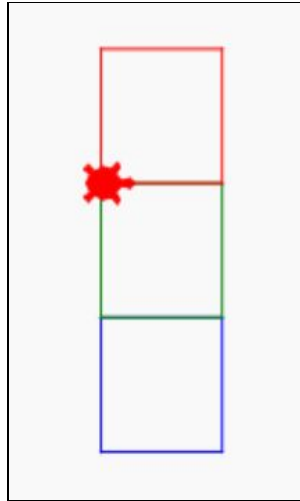
- Start drawing your shape!

```
tina.circle(50)
```

## Tower Drawing Project

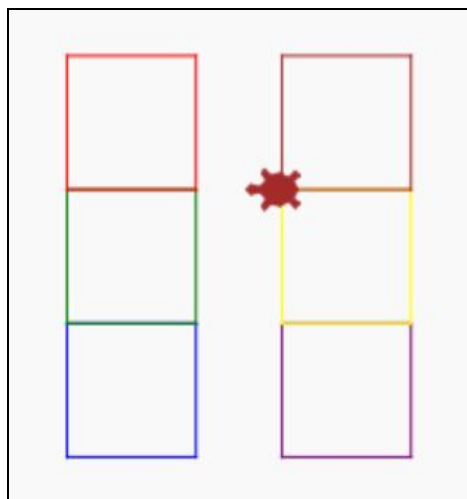
Use what you have learned in this lesson to make Tina the Turtle draw two towers that consist of **three different coloured squares, on top of one another**.

- Draw the first tower at any location on the screen.

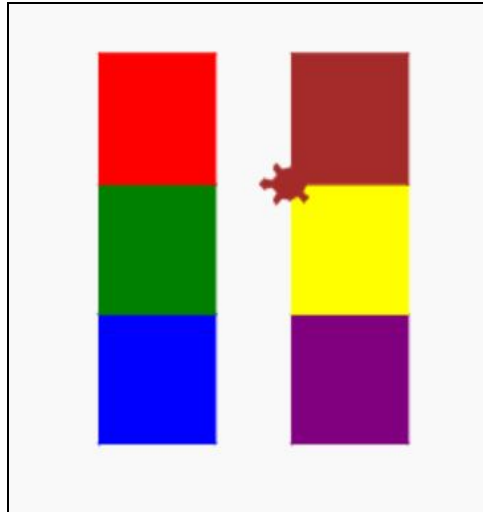


**Hint:** Start at the bottom left of the blue square.

- Draw the second tower at a different location on the screen and using different colours to the first tower.



- Fill each of the tower blocks with colours.



- Save your work!