Overview

In this lesson, you will learn how to control **pen settings** for the turtle. Pen settings determine how lines are drawn on the screen, including their **thickness**, their **color**, and how to **fill in shapes**. This lesson avoids loops and focuses only on direct turtle commands.

Important Information

The turtle's pen is responsible for drawing lines as the turtle moves. Changing pen settings affects the drawing, not how the turtle moves or looks.

Changing the Pen Size

You can control how thick the turtle's lines are using:

```
t.pensize(size)
```

or

```
t.width(size)
```

- `size` is a number
- Larger numbers make thicker lines
- Smaller numbers make thinner lines

Example:

- `t.pensize(1)` draws a thin line
- `t.pensize(6)` draws a thick line

Changing the Pen Color

You can change the color of the lines using:

```
t.pencolor("color_name")
```

Examples of color names include:

- `"black"`
- `"red"`
- `"blue"`
- `"green"`
- `"purple"`
- `"orange"`

This only affects the lines drawn by the turtle.

Filling Shapes

The turtle can fill in closed shapes with color.

Filling always follows this process:

1. Set the fill color
2. Start the fill
3. Draw a **closed shape**
4. End the fill

Setting the Fill Color

```
t.fillcolor("color_name")
```

Starting and Ending the Fill

```
t.begin_fill()
# draw the shape here
t.end_fill()
```

Important rules:

- The shape must be closed for the fill to work
- Everything drawn between `begin_fill()` and `end_fill()` is filled
- The fill appears when `end_fill()` is called

Set Up

Create a new Python file called `turtle_pen_settings.py`.

Copy, Change, Challenge

Copy

Copy and run the following code.

```python
import turtle

t = turtle.Turtle()

t.pensize(5)
t.pencolor("blue")
t.fillcolor("yellow")

t.begin_fill()
t.forward(100)
t.right(90)
t.forward(100)
t.right(90)
t.forward(100)
t.right(90)
t.forward(100)
t.right(90)
t.end_fill()

turtle.done()
```

Observe:

- The thickness of the lines
- The outline color
- The filled color inside the shape

Change

Modify the program so that:

- The pen size is different
- The outline color changes
- The fill color changes

Run the program again and observe the differences.

Challenge

Create a filled shape that:

- Uses a thick pen
- Uses different colors for the outline and the fill
- Is clearly a closed shape

Do not use loops. Use only direct movement and turn commands.