Beginning Python: Lesson 6

In this lesson you will learn about **Turtle**. Turtle is a nice way to learn some of the basics of computer graphics, so in this lesson, we'll use a Python turtle to draw some simple shapes and lines.

Your first turtle program

Let's write a couple of lines of Python program to create a new turtle and start drawing a rectangle. (We'll call the variable that refers to our first turtle *alex*.

```
import turtle
wn = turtle.Screen()

alex = turtle.Turtle()
alex.forward(50)
alex.left(90)
alex.forward(30)
alex.left(90)
alex.forward(50)
alex.left(90)
alex.forward(30)

wn.mainloop()             # Wait for user to close windowimport
turtle
```

When we run this program, a new window pops up with a rectangle. The arrow on the screen shows the location of the turtle.

Colours and Pen Size

We can change the colour of the line and the background. Try the following program to draw a triangle.

```
import turtle
wn = turtle.Screen()
wn.bgcolor("lightgreen")
wn.title("Hello, Tess!")

tess = turtle.Turtle()
tess.color("blue")
tess.pensize(3)
tess.forward(50)
tess.left(120)
tess.forward(50)
tess.left(120)
tess.forward(50)

wn.mainloop()
```

A herd of Turtles

Just like our other programs, we can have more than one variable. In this case we'll create two *instances* of a turtle, Alex and Tess:

```
import turtle
wn = turtle.Screen()
wn.bgcolor("lightgreen")
wn.title("Tess & Alex")
```

```
tess = turtle.Turtle()
tess.color("hotpink")
tess.pensize(5)

alex = turtle.Turtle()
alex.color("blue")
alex.pensize(5)

tess.forward(80)
tess.left(120)
tess.forward(80)
tess.left(120)
tess.forward(80)
tess.left(120)

alex.forward(80)
alex.left(-90)
alex.forward(80)
alex.left(-90)
alex.forward(80)
alex.left(-90)
alex.forward(80)
alex.left(-90)

wn.mainloop()
```

Using Loops to Simplify the program

To draw a square we'd like to do the same thing four times — move the turtle, and turn. We previously used 8 lines to have alex draw the four sides of a square. This does exactly the same, but using just three lines:

```
import turtle
wn = turtle.Screen()
wn.bgcolor("lightgreen")
wn.title("Tess & Alex")

alex = turtle.Turtle()

for i in [0,1,2,3]:
```

```
    alex.forward(50)
    alex.left(90)

wn.mainloop()
```

Turtle footprints

Try the following program. It makes a turtle “stamp” it’s footprint onto the canvas:

```
import turtle
wn = turtle.Screen()
wn.bgcolor("lightgreen")
tess = turtle.Turtle()
tess.shape("turtle")
tess.color("blue")

tess.penup()
size = 20
for i in range(30):
    tess.stamp()
    size = size + 3
    tess.forward(size)
    tess.right(24)

wn.mainloop()
```

Challenges

Try the following if you’re finished:
- Use for loops to make a turtle draw these shapes
An equilateral triangle;A square;A hexagon (six sides);An octagon (eight sides)

- **Super Challenge**: Write a drunken prirate program as follows:
  A drunk pirate makes a random turn and then takes 100 steps forward, makes another random turn, takes another 100 steps, turns another random amount, etc.