Python Coding Camp – Session 2

Turtle Graphics

In 1967 Wally Feurzeig, Seymour Papert, and Cynthia Solomon created an educational programming language called Logo. One of the most popular features of Logo was its support for **turtle graphics**, which could be used to program a robot called a **turtle** to draw pictures on a large sheet of paper using a retractable pen. Later versions of Logo supported programming a virtual turtle that could draw pictures on a screen Version 3 of the Python language contains a **module** – a collection of Python code that can be used to write programs – called `turtle` that implements turtle graphics.

Let's take a look at what the `turtle` module can do:

1. Start up IDLE.
2. Import the `turtle` module by typing the following statement at the prompt:

   ```
   >>> from turtle import *
   ```

   It may appear like nothing happens after you hit enter, but you now have access to everything in the `turtle` module.
3. Create a new window with a turtle in it by typing the following statement at the prompt:

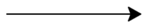
   ```
   >>> showturtle()
   ```

   This should pop up a window with a little black arrowhead shape in the middle pointing to the right. It should look something like this:

4. Make the turtle draw a line by typing the following statement at the prompt:

   ```
   >>> forward(100)
   ```

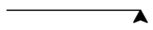
   The result should look like this:

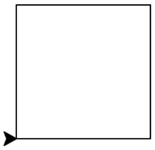
5. Make the turtle turn 90° to the left by typing the following statement at the prompt:

   ```
   >>> left(90)
   ```

   The turtle should now be pointing up:

6. Repeat steps 4 and 5 three more times to draw three more lines to make a square. When you are done, it should look like this:



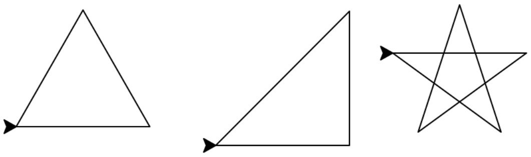
7. When you are done, you can clear the screen by typing the following statement at the prompt:

```
>>> clear()
```

8. If you need to get your turtle back to where it started, type the following statement at the prompt:

```
>>> home()
```

9. Use what you have learned so far to draw the following shapes:



This may take a little trial and error with different angles.

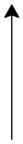
Hello Turtle!

Let's see what else the turtle can do. Instead of drawing shapes, lets try drawing some letters. We'll start by drawing an H.

1. If you haven't already, use `home()` and `clear()` to move the turtle back to where it started.
2. We need a vertical line, so we need to turn the turtle to the left and draw a line upwards:

```
>>> left(90)
>>> forward(100)
```

The result should look like this:



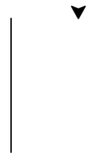
3. Now we need to draw another vertical line, but we don't want to connect them yet. Type the following to stop the turtle from drawing lines when it moves:

```
>>> penup()
```

4. Now we need to turn the turtle to the right by 90°, and move it over, then turn right again:

```
>>> right(90)
>>> forward(50)
>>> right(90)
```

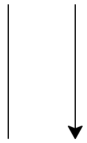
The result should look like this:



5. Now we want to draw again, so we need to get the turtle to put the pen back down before we draw another line.

```
>>> pendown()
>>> forward(100)
```

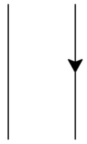
The result should look like this:



6. Now all we have left is the crossbar between the two vertical lines. Instead of turning around and going up, we can just go backward:

```
>>> backward(50)
```

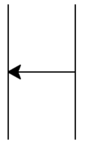
The result should look like this:



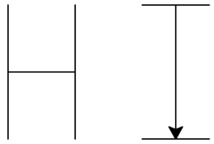
7. Now we can turn right and draw the final line:

```
>>> right(90)
>>> forward(50)
```

The result should look like this:



8. See if you can use what we've learned so far to draw an I next to the H so it looks like this:



9. When you are finished you can close the turtle window by typing the following at the prompt:

```
>>> bye()
```