STAR GAZING WITH PYTHON TURTLE (Part 3) - Create a Galaxy of Stars

Introduction: This worksheet is written to create bite size chunks of the Club Leader Resources – Constellation program.

Start:

1. Setup and assemble the Raspberry Pi (RPi) environment:
    a. Connect RPi to a monitor, keyboard and mouse
    b. Power up the RPi module
    c. Observe the start-up script
2. Login and enter password
3. Start the GUI by typing 'startx'
4. Open the Python 3 programming environment IDLE3
5. Click on **File** and **Open New Window**
6. Click on **File** and **Save As** and naming it `Star_Turtle_05.py`

Coding:

[Note the use of the comment # (hashtag) this will add further information about the code behaviour. Be careful to observe the use of capital and small letters.]

1. Enter the following code into the new window:

2. Before you start to write your program import the Turtle and Random Libraries

```
import turtle               #Import the Turtle Library
import random               #Import the Random Library
```

3. Next create a window to display the turtle window. Assign this to a variable.

```
wn = turtle.Screen()        #wn = variable; note Screen has a capital S
```

4. Give your turtle a name.

```
t = turtle.Turtle()         #t is the name of the turtle (use your own name if preferred);
                            #note Turtle() has a capital T
```

5. Create a list of star colours

```
starColour = ["Red","Green","Blue"]     #square brackets indicate a list of colours
```

6. Create a function to move a random location

```
def moveToRandomLocation():
    t.penup()               #stops the turtle from writing on the screen
    t.setpos( random.randint(-200,200) , random.randint(-200,200)
                            #setpos sends the turtle to an (x,y) position
    t.pendown()             #enable the turtle to write on the screen
```

7. Create a function to draw and size a star

```
def drawStar(starSize, starColour):    #create a function drawStar with a
                                       #starSize
    t.color(starColour)    #change colour of the turtle
    t.pendown()
    t.begin_fill()         #entered to begin the fill process
    for side in range (5):
        t.left(144)
        t.forward(starSize)
    t.end_fill()           #entered to end the fill process
    t.penup()
```

8. Create a function to create a galaxy of stars

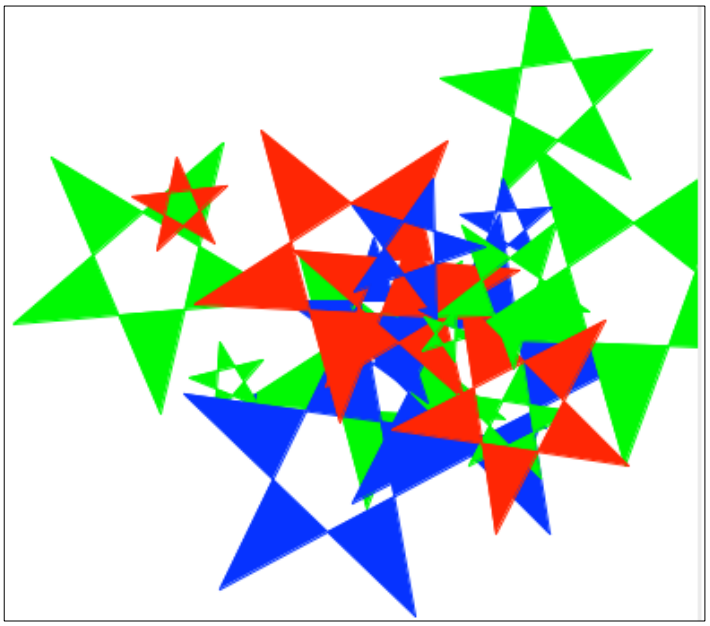
```
drawGalaxy(numberOfStars):
    moveToRandomLocation()
    for star in range(numberOfStars):
        t.penup()
        t.left( random.randint(-180,180))
        t.forward( random.randint(-180,180))
        t.pendown()
        drawStar(random.randint(10,200), random.choice(star.Colour))
```

9. Complete code

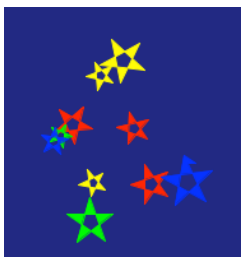
```
t.speed(5)                          #changes the speed of the turtle

drawGalaxy(20)                      #changes the number of stars in the galaxy
wn.exitonclick()
```

10. Save and run the code



11. Challenges: Change the values in the code to create <u>smaller</u> stars. Change the range of colours to include Yellow and White stars. Change back ground colour Hint: `wn.bgcolor("MidnightBlue")`



Try other shapes by changing the star shape