Yixin Li's CS151 Project 1

This project focuses on creating algorithms, as a Python turtle sequence, to draw various shapes with parameters. The first shape I made, shown as shapeA below, is a yellow rhombus by moving forward and turning right or left in specific degrees. The second shape I created is a heart shape filled with pink color. This shape contains steps like moving forward, turning right and left, and using for loops to create the circular shape. The file Shapes includes a series of complex commands combining the shapeA and the ShapeB into shapeThree by setting various heading for the turtle to create a flower shape. A function called shapeC is also in the file, which draws a star shape and has three parameters controlling the star's size and color. Besides, the shapeD function calls the shapeC function multiple times with different parameters resulting in shapeC being drawn in multiple colors at different sizes.

In order to accomplish these tasks, I focused on how I could integrate different commands to make the turtle draw various shapes. First of all, I figured out the length the turtle should move to draw the enclosed shapes. Then I paid attention to which angle the turtle should turn to make the shapes more attractive. Finally, I set positions and headings for the turtle to start and added elements like rotations with loops and different parameters such as color and length.

I chose to create some additional functions for my first extension and call them to draw an interesting image. I used various functions to develop shapes, including circle and oval with different pen size, pen color, and fill color. Together I combined these functions into a clown image. For my second extension, I chose to create functions drawing an n-gon with parameters side lengths and number of sides.

Through the project, I learned how to create functions with different Python turtle commands and parameters to create interesting images. Besides simple directional commands such as moving forward/backward and turning right/left, I understood how to use loops to draw circular shapes and adjust color for pen and shape.

Required Image 1 (ShapeA):

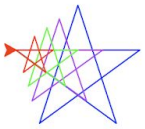
```
import turtle
window = turtle.Screen()
t = turtle.Turtle()

t.setpos(0, 0)
t.setheading(0)
def rhombus(color):
    t.color(color)
    t.begin_fill()
    t.left(140)
    t.forward(200)
    t.right(110)
    t.forward(200)
    t.right(70)
    t.forward(200)
    t.right(110)
    t.forward(200)
    t.end_fill()
rhombus('yellow')



window.exitonclick()
```


Required Image 2 (shapeB):

```
import turtle
window = turtle.Screen()
t = turtle.Turtle()

t.setpos(0, 0)
t.setheading(0)
def heart(color):
    t.speed(400)
    t.color(color)
    t.begin_fill()
    t.left(140)
    t.forward(100)
    for times in range(200):
        t.right(1)
        t.forward(1)
    t.left(110)
    for times in range(200):
        t.right(1)
        t.forward(1)
    t.forward(100)
    t.end_fill()
heart('pink')



window.exitonclick()

```


Required Image 3 (shapeC):

```
55
56  def shapeC(length, color, angle):
57      t.color(color)
58      for times in range(5):
59          t.forward(length)
60          t.right(angle)
61  shapeC(100, 'blue', 144)
62
63  t.speed(100)
64
65  def shapeD(length, color, angle):
66      shapeC(length, color, angle)
67  shapeD(70, 'purple', 144)
68  shapeD(50, 'green', 144)
69  shapeD(30, 'red', 144)
70
71  window.exitonclick()
```



Extension1 (Draw a clown):

Extension2 (Draw an n_gon):

```python
'''Draw an n-gon'''

import turtle
window = turtle.Screen()
t = turtle.Turtle()

def n_gon(side_length, num_side):
    angle = 360 / num_side
    for i in range(num_side):
        t.forward(side_length)
        t.right(angle)
n_gon(60, 18)
n_gon(30,5)
n_gon(40,12)
n_gon(20,6)

window.exitonclick()
```

```
PROBLEMS 24   TERMINAL   ···   2: Python

ECATION=1 to suppress this warning.
yixinli@MacBook-Pro 1 % /Library/Developer/Com
on3 "/Users/yixinli/python /1/Project01/extens
DEPRECATION WARNING: The system version of Tk
emoved in a future release. Please don't rely
ECATION=1 to suppress this warning.
yixinli@MacBook-Pro 1 % /Library/Developer/Com
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```