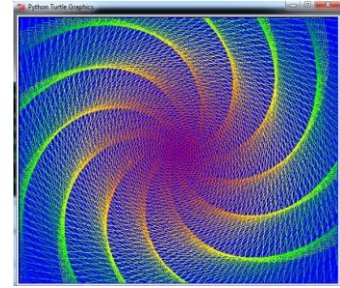




Python Project #3

The turtle module



DISCLAIMER: For this project I want everyone to use “**import** turtle” instead of the other forms of import. This way we are all using the same format. Also, there’s specific reasons for this that I will explain in class.

This project is my favorite project that we do in python. We will have 3 parts:

1. The first part will be the set-up, creation and basic navigation of turtle attributes.
2. The second part will be specific functions and drawings that I want you to create.
3. The last part will be your chance to be as creative as you can. Show me what you got!

Part 1: Regular Polygons

1. Create a new folder on your desktop named: LastName_TurtleProject
2. Create functions that will perform the following without any variables in the ()’s:
 - a. Draw a square
 - b. Draw an Equilateral Triangle
 - c. Draw a Regular Pentagon
 - d. Draw a Regular Hexagon
 - e. Draw a Regular Nonagon
 - f. Draw a Regular Decagon
3. Add the variable (s) to your function that will allow the side length to be defined when calling the function. You do not have to create a new file for this.
4. **CHALLENGE:** Create a function that will ask the user how many sides to make the regular polygon and then make it. (Try and think about what the programs all have in common above. How many degrees did you have to turn? How is it dependent on the number of sides? How long should each side be?)

Name this function: **AnyRegPoly(n)**

*****You may use more variables than just n if you prefer*****

5. Using the function from question 3, see how many sides you need to add before it becomes a circle. Is it really a circle? Will it ever really be a circle? Do circles actually exist?

Part 2: Turtle Attributes

1. You can change the turtles “attributes”. Refer to the document here to see a list of different attributes that you can change:
<https://docs.python.org/3.6/library/turtle.html>
2. write a program that will change the speed of the turtle. Then extract the draw square function and run it for speeds from 0-10.
3. Which one is the fastest? Which one is the slowest?
4. Change the colormode to RGB and make the turtle color (255, 255, 255). Draw a square and tell me what color that is. Now change it to (255, 0, 0). What color is this? Next (0, 255, 0). How about (0,0,0)?
5. Change the background color.
6. Modify your drawsquare function so that it draws each side a different color. (You may want to use variables for (R, G and B) instead).
7. Run the function AnyRegPoly(n) for 12 sides AND change colors throughout. What happens if the color range gets outside of 0-255? How can you keep this from happening?
8. Change the shape of the turtle and add “stamps” throughout the program (wherever and whenever you want). How many different “shapes” are there?

Part 3: Nested Loops

1. Write a program that will call the draw square function inside a FOR loop. Make it so that each time it goes through the loop, the square changes size.
2. Write a program that will make a series of squares that share the same corner.
3. Repeat this so they share the same center. (You may want to consider using the .goto(x,y) attribute of turtle)
4. Write a function that does a nested loop (FOR or WHILE loop) within another loop and calls ANY function that you have written for each. What crazy designs can you come up with.
5. Write a function that has a series of regular polygons that all share the same corner.
6. Can you make it so they share the same center? *I actually haven't done this.....yet!

Part 4: Fun time

1. Create something cool. Use whatever attributes you want. See what you can come up with, this should just be fun to explore and play. When we are finished, we will present this during a gallery walk. This will NOT be your final project on this topic, so don't worry too much. Think of this as a rough draft / brainstorming time for you to discover what you've actually learned.