Project 3: Scenes Within Scenes

Abstract:

In this project, we practiced using functions to make scenes with hierarchical complexities by creating collections of compound shapes, which came from some simple shapes, and assembling them to a museum scene. Through this project, our goals are to make functions work as independent units to re-use them. We also got a chance to use conditionals, keyword arguments, and command-lines to add nuance to the scenes and practice for better code organization.

Main tasks:

- Making a Mondrian scene

Imported from lab3.py, function defining Mondrian in better_shapelib.py was made with several keyword arguments and command-lines controlling its sizes, filling colors, locations, and the number of rectangles. Image 1 shows the randomness of color and size of the Mondrian.
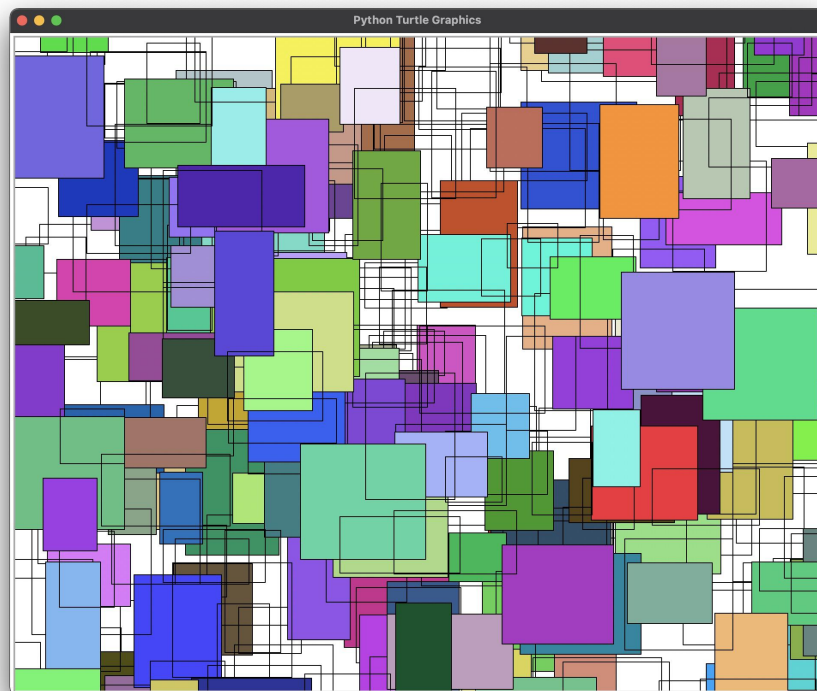

Image 1

Image 2 (Required Image 1) presents the result of using command-lines to draw fifteen triangles.
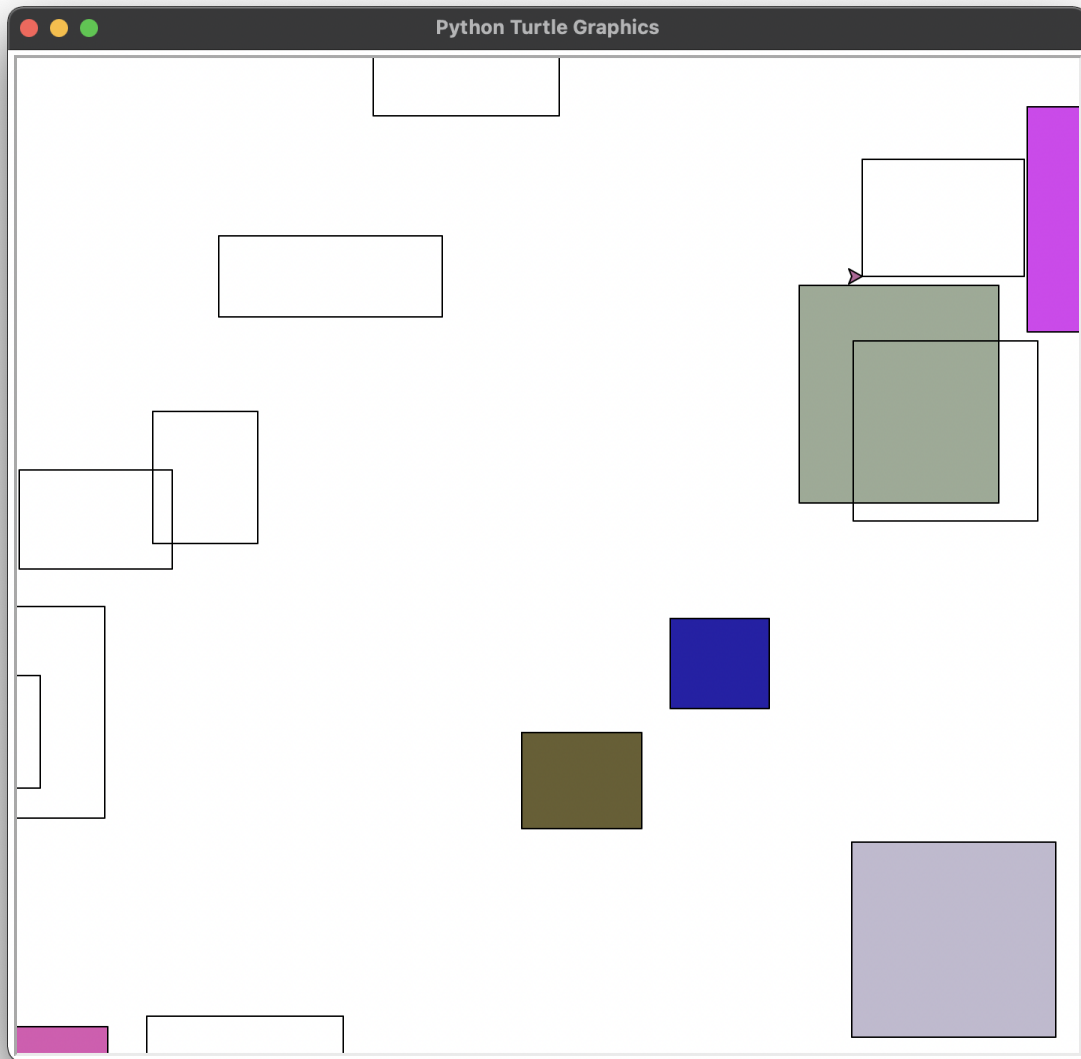

Image 2

- Using parameters to draw scenes at multiple positions and scales

Recombining simple shapes and compound shapes copied from Project 2, I set the space scene in various coordinates with different scales. Image 3 (Required Image 2) shows the result called by myScene function under if __name__ == '__main__' for several times with scale (½, ⅓, and ¼) and x and y coordinates as (0, 0), (-300, 300), and (300, 300), respectively. This step clearly shows the significance of the scale parameter in creating scene within scene.
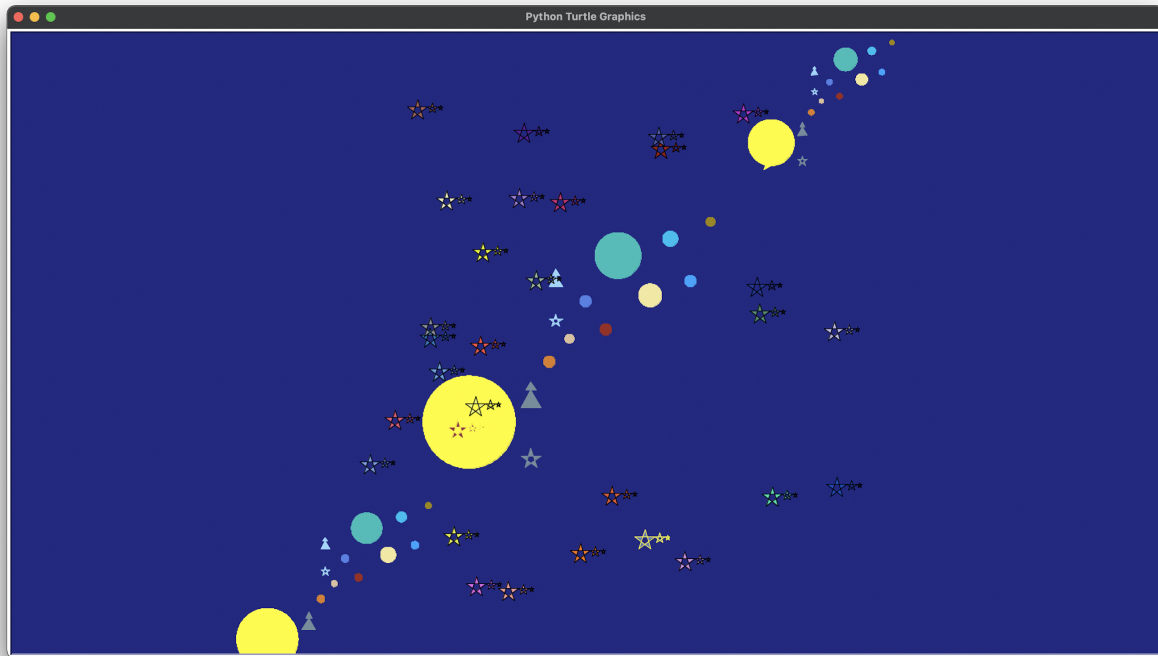
Li_CS151Project3

Image 3

- Creating a museum scene

After importing better_shapelib to museum.py, I created a function called museum in the file, a new scene that looks like a museum, including the updated scene from Project 2 and the Mondrian I created above. I also added other simple shapes like frames, paintings, circular and rectangular decorations to make the scene look like an actual museum.
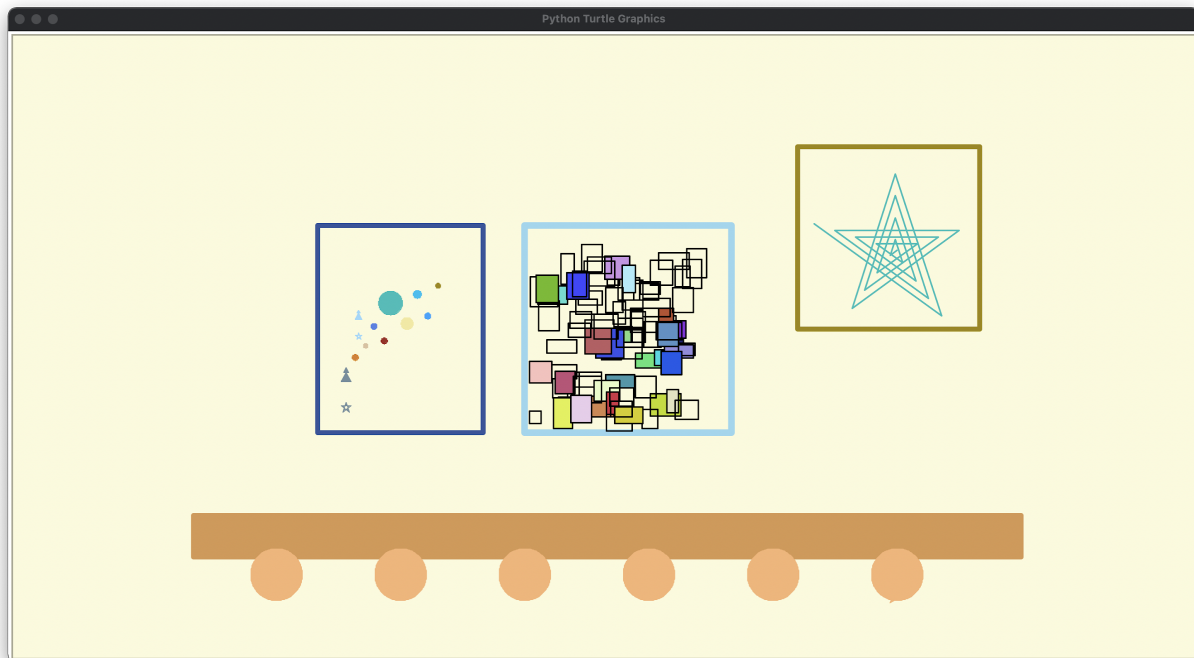
Image 4

Extension:

Extension - Making a new scene:

For the second extension, I created another scene, the spiral star painting, to make my museum scene more vivid and realistic with details.

Learning outcomes:

Through this project, I learned how to combine simple shapes to complex shapes and assemble those shapes into a scene that can be placed in a more significant scene. I also explored using conditionals, command-line arguments, and keyword parameters to add different structures to the scenes.