CS 212 - Assignment 1

Lotkey

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Contents

1 Overview

The submitted program uses the turtle library to draw 5 non-overlapping squares of random sizes and fill them in with random colors. It is formatted with Black and contains type hints, comments, and doc-strings to improve readability.

The program is being submitted as a plain Python file instead of a Jupyter Notebook. This is because I couldn't get the turtle window to appear with Jupyter Notebooks in Jupyter, VS Code, or Google Colab.

2 File Layout

The submitted .py file has the following format:

- Imports
- Main function
- Implementation
- Main caller

This layout mimics a C++ source file. An advantage of this layout is that it starts with a high-level overview of the program (the main function) and then shows the implementation details. This improves readability. If the reader chooses to read the implementation details they will have read the high-level overview as context. Since main() is called at the bottom of the file all of the functions, classes, etc. used in main() can be defined before main() as long as they are defined before main() is called.

3 Imports

This program imports the following libraries:

- turtle - for drawing the squares
- random - for randomly placing, sizing, and coloring the squares
- sys - for implementing the main() pattern

4 Main

The main function does the following:

- Changes the shape of the drawer to a turtle (for fun)
- Changes the speed of the turtle to fast
- Draws the 5 squares
- Calls turtle.done() to leave the turtle window open in VS Code
- Returns 1 to indicate that the program exited successfully

5 Implementation

5.1 Classes

5.1.1 square

The purpose of the square class is to represent a square that can be drawn in the turtle window.

A square object is constructed from its position on the turtle window and the length of its sides. It has functions that provide the location of its bounds (left bound, right bound, etc.). The overlaps() function will determine whether or not the square overlaps with another square on the turtle window. The draw() function draws the square on the turtle window and fills it with a random color. The static draw_squares() function will draw some amount of randomly sized and place squares on the turtle window and ensures that they do not overlap.

5.2 Functions

5.2.1 turtle_teleport()

This function moves the drawing turtle to a place on the turtle window without drawing.

6 Main caller

This is where the program begins execution. Once all the implementation is defined, the main() function is called. If main() exits successfully then sys.exit() will be called with 1 and the whole program will exit successfully.

7 Resources Used

- Turtle documentation