1. What is a Python library and how do you include one in your script?

   A python library is a collection of pre-written code that has functions and other tools to help complete code without doing it from scratch. To import your library you have to create a new terminal by going to the command palette(ctrl+shift+p) and type 'Python:create terminal'. In this new terminal, type "pip install …" and enter whichever library you would like to install, then press enter.

2. What does it mean for elements of a circuit to be in series vs. in parallel?

In a series circuit, components are connected end-to-end. These form a single path so the current is the same through all components and the voltage is divided among them. A parallel circuit has the components connected side-by-side. This means the voltage is the same through each component but the total is the sum of each individual path.

3. Can you create a circuit of 3 light bulbs in series? Why or why not?

Yes, but the light will be significantly duller than just one bulb. This is because the voltage has to flow through all lightbulbs evenly. However, if the voltage is too low the lightbulbs might not have enough current to light up the circuit.

4. The stoplight pattern is Green ON for 5 seconds, Yellow ON for 1 second, and Red ON for 4 seconds. Define the function f (t) as a **piecewise** function that outputs 1 if the green light is on, 2 if the yellow light is on, and 3 if the red light is on over 10 seconds. The bounds of the function are 0 <= t <= 10

Green- 0<=t<5   output:1

Yellow- 5<=t<6 output:2

Red- 6<=t<=10 output:3

f(t)={1 0<=t<5 2 5<=t<6 3 6<=t<=10}

5. Sketch a graph of f (t) over 10 seconds using a step-like shape.