Mini Project 2 Submission

Circuit Design Overview: The circuit design consists of 3 main modules. The first module, called `pwm`, generates the PWM signal, which is then passed through two additional modules to reach the LED, making it appear to dim and brighten. The `pwm` module was copied from Brad Minch's Fade example located here (https://github.com/bminch/iceBlinkPico). The inputs to the `pwm` module are provided by the `pwm_wrapper` module that creates the `pwm_value` that is used to control the duty cycle of the PWM signal. The `pwm_wrapper` module allows us to create a PWM signal with an incrementing duty cycle and another PWM signal with a decrementing duty cycle, which we can choose based on the `DUTY_CYCLE_FUNC_MODE` parameter. The `top` module has the state machine and counter to determine when the state needs to change, and has connections to the LED outputs. In summary, there is the `top` module that has the state machine and calls on the `pwm_wrapper` module that changes the duty cycle of the PWM signal and then calls on the `pwm` module that actually makes the PWM signal.

System Verilog Files: https://github.com/H-TejadaDeras/ENGR3410-01.25FA/tree/main/assignments/mini%20project%202

Demo Video: https://olincollege-my.sharepoint.com/:v:/g/personal/htejada_olin_edu/EVCPvocJuQRFvVCHf3_OascBPYcx5lxh6NPgMVCMWSq6GA?nav=eyJyZWZlcnJhbEluZm8iOnsicmVmZXJyYWxBcHAiOiJPbmVEcml2ZUZvckJ1c2luZXNzIiwicmVmZXJyYWxBcHBQbGF0Zm9ybSI6IldlYiIsInJlZmVycmFsTW9kZSI6InZpZXciLCJyZWZlcnJhbFZpZXciOiJNeUZpbGVzTGlua0NvcHkifX0&e=kdxkS6

State Machine Timing Diagram (next page):

Sample PWM Timing Diagram (next page):