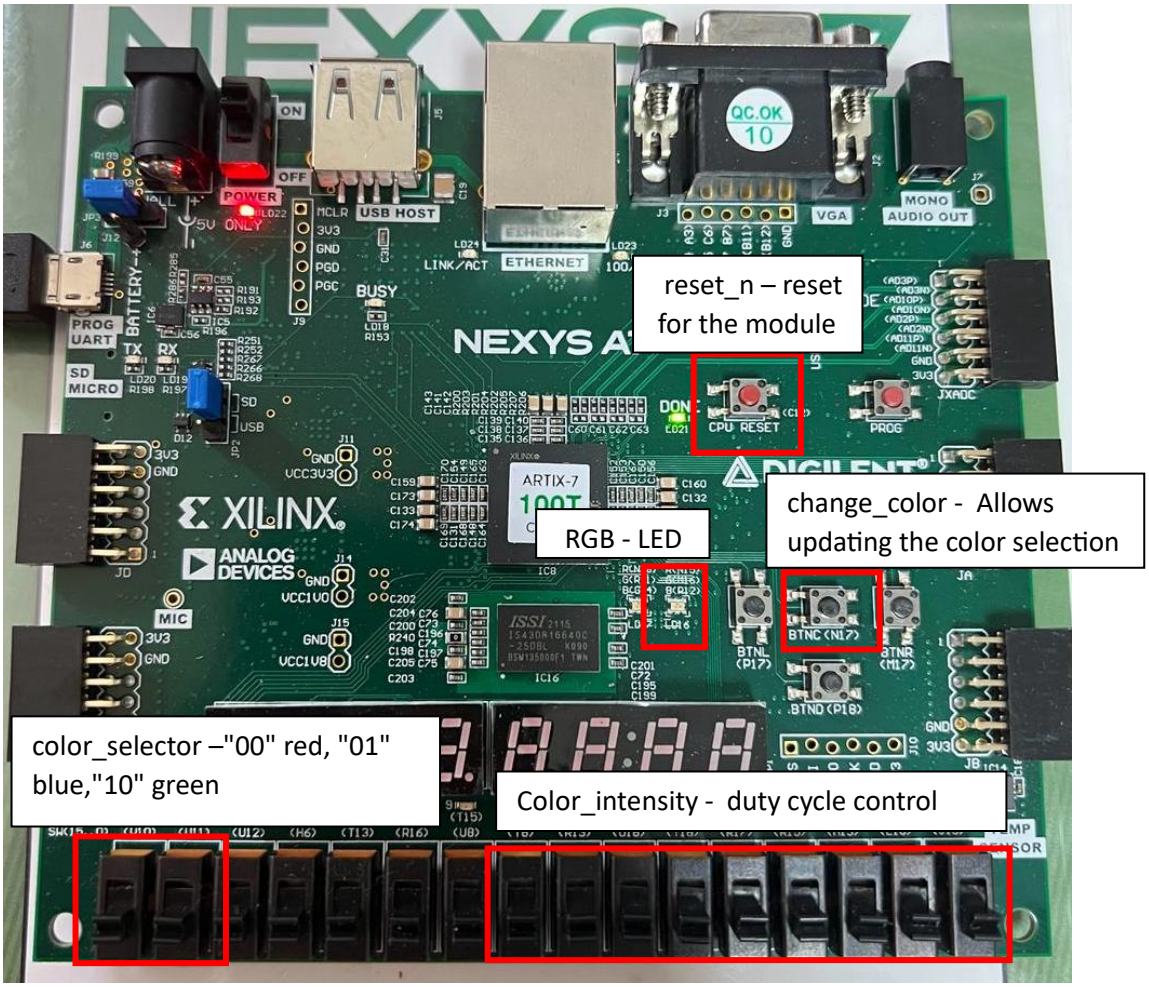
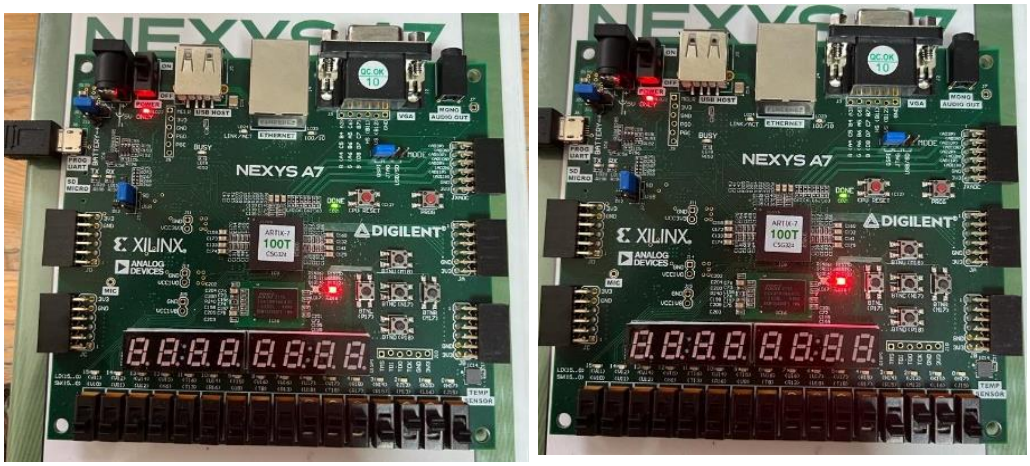
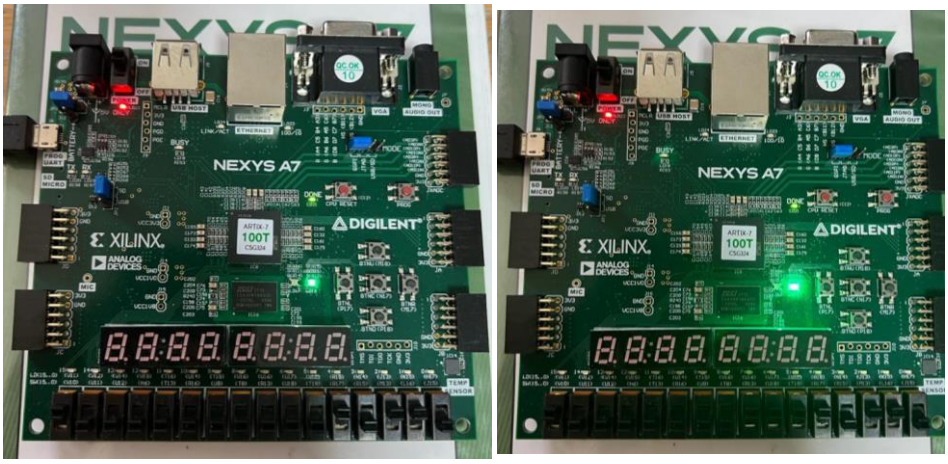


When the color selection leg is set to "00", the red panel light is activated. An observable distinction between the images is the augmentation in duty cycle. It is evident that as the duty cycle value increases, there is a corresponding alteration in the brightness of the LED bulb.



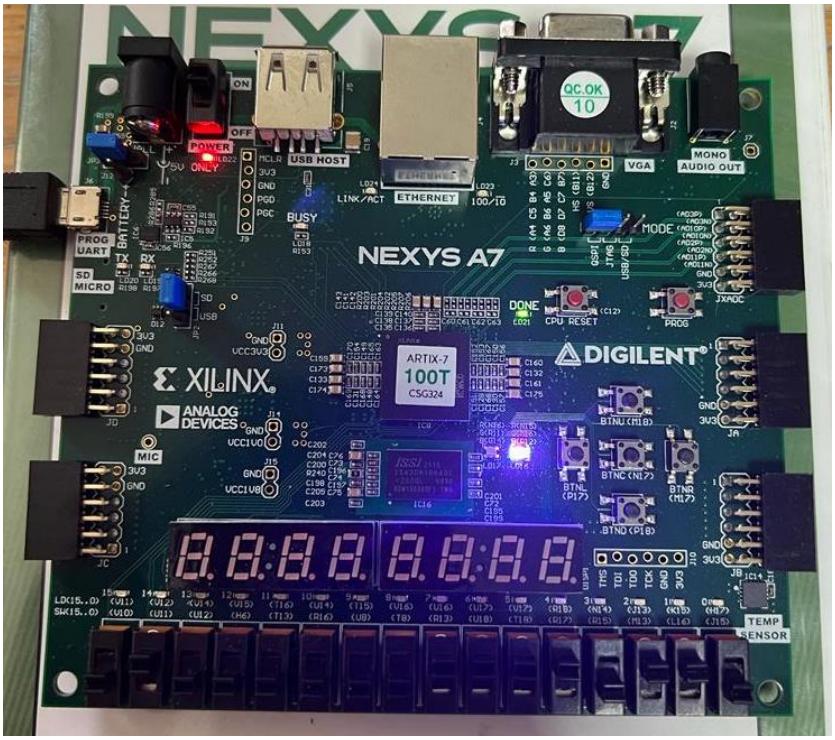
Visualizing LED Brightness Variation with Duty Cycle Modulation on FPGA

When the color selection leg is set to '01', the green panel light is activated. Similarly to the red color activation, the differences between the images are primarily attributed to the increase in duty cycle. As the duty cycle value rises, the brightness of the LED bulb changes, demonstrating the impact of duty cycle modulation on the intensity of the green light.



Visualizing LED Brightness Variation with Duty Cycle Modulation on FPGA

By simultaneously activating the red and blue lights, a vibrant purple color is achieved. This result is obtained by setting the color selection legs to '00' for red and '10' for blue. Notably, the brightness of the purple light is significantly heightened by increasing the DUTY to nearly its maximum value. The augmented DUTY amplifies the intensity of both the red and blue components, resulting in a visually striking and brilliantly illuminated purple hue.



Illuminating Vibrant Purple with Increased Duty Cycle: Red and Blue Light