# Switches & LEDs

Lab 02

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# Design Description

The design creates a unique LED display pattern on the Basys3 FPGA board based on joystick button inputs and slide switch settings. The system will light up a variable number of LEDs on either the left or right side of the board and display the selected number on the seven-segment display.

The component takes in the press for enabling the right or left side of the leds and based on the combination of switches flipped, the enabled sides of leds will light up. The combination of switches correlates to the binary value from 0 to 7. Since 7 leds per side will be on, only  a max of 7 will be accessed at a time.

# Component

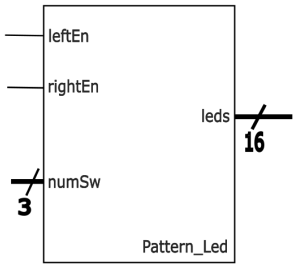


*Figure 1: Pattern_Led Component Diagram*

# Design

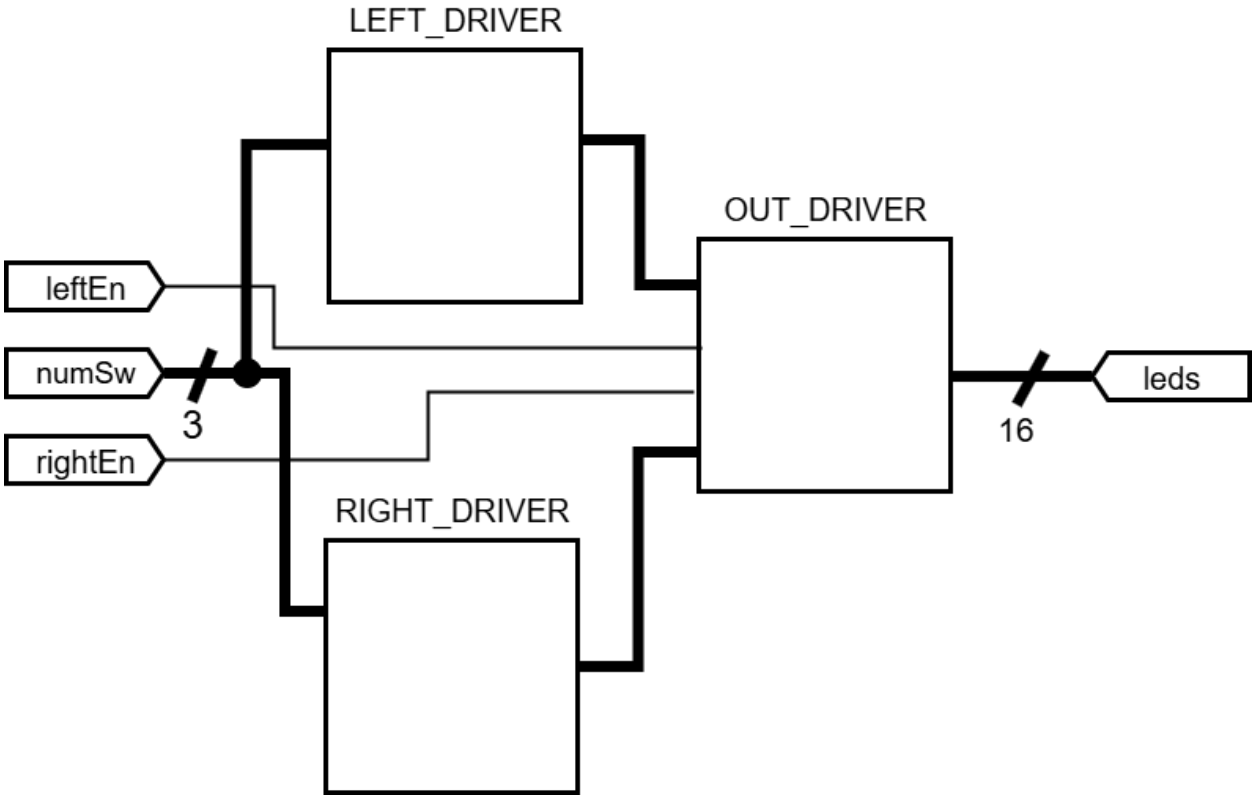


*Figure 2: Pattern_Led Design Diagram*

# Test Bench

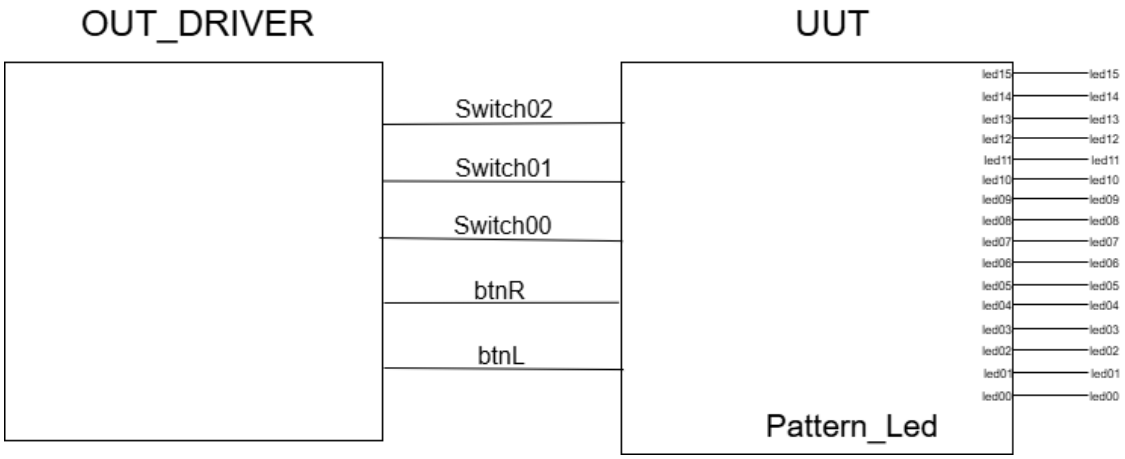


*Figure 3: Pattern_Led Test Bench Diagram*

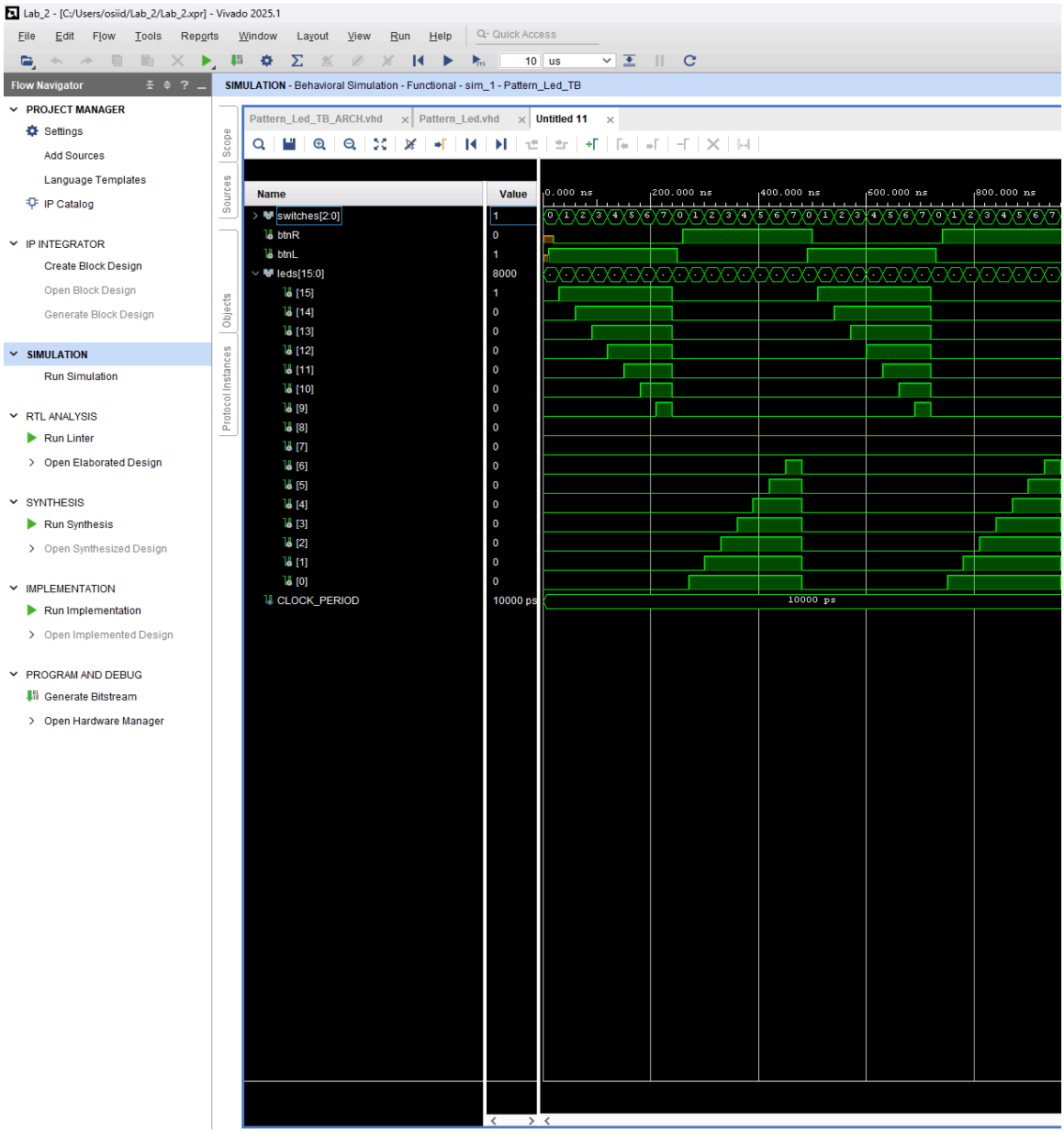


*Figure 4: Pattern_Led Test Bench Waveforms*

# Basys3 Wrapper

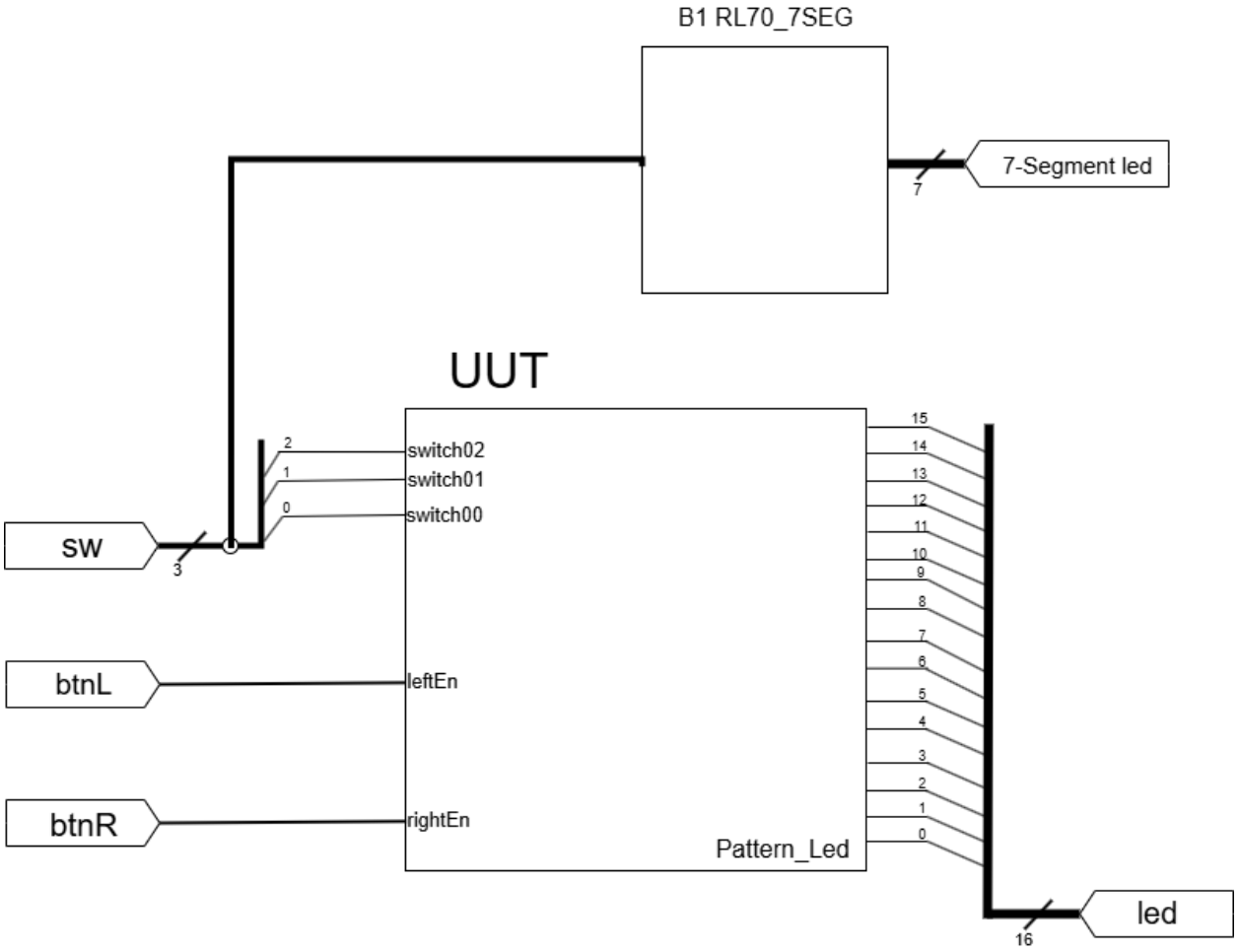


*Figure 5: Pattern_Led  Wrapper for Basys3*