

*Lab Assignment #1*

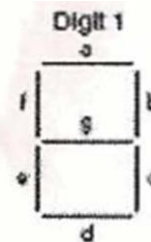
**Design and Implement a Decimal Push Button Counter**

**Objective:** Use the 7-segment LED displays on the UP2 board as a decimal counter. The inputs to the counter are applied using the Push Buttons on the board. Pressing PB1 push button should increment the tenths place by one. Pressing PB2 push button should increment the units place by one. The two 7-segment LEDs together should be used to display a two-digit number. The LED on the left will be used to display the tenths place digit, and the LED on the right will be used to display the units place digit. So, the number "56" will be displayed on the two LEDs, with "5" being displayed in the first LED and "6" being displayed on the LED to the right.

The counter should be initialized to zero. Pressing PB1 button should increment the count by the decimal number 10. Pressing PB2 button should increase the displayed count by the decimal number 1. Only the least two digits are displayed on becomes greater than 99.

Tip: To display decimal numbers on the LED, you will need to create a table, the first few rows of which I have filled in below:

Digit Displayed	Illuminated Segment						
	a	b	c	d	e	f	g
0	1	1	1	1	1	1	0
1	0	1	1	0	0	0	0



**Bonus:** Instead of using the push button to increment the counter, use the clock signal instead. Since the clock frequency is too fast to see the counter output, you need to make a clock divider to reduce the clock frequency. Find the divisor value that will make the numbers displayed on the LED to be visible.