EECS3216

Lab 3

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**Problem Statement**

Write a Systemverilog (or Verilog) code to do the following:

* There are two sets of lights, three for left turn, and three for right turn.
* The six lights are the left most three LEDs and the rightmost three LEDs
* The positional switches SW0 and SW1 activate the turn signal when they are in the 1 position.
* SW0 activates the right turn, and SW1 activates the left turn.
* When both are in the 0 position, all LDs are off.
* When one of them is in the 1 position and the other in the 0 position, the turn right/left sequence starts.
* When both are in the 1 position, all LEDs are off and ‘E’ is displayed on one of the 7-segment displays to indicate error.
* Flipping the switch to the 1 position, starts the sequence, returning it back to the 0 position turns off all LEDs. Turning the other switch to the 1 position turns all LEDs off (now both are in the 2 position)
* If both switches are in the 1 position (all LEDs are off and ‘E’ is displayed on one of the 7-segments) turning one back to the 0 position, the sequence corresponding to the switch in the 1 position starts and the ‘E’ disappears

The order the lights turns on is as follows:

Diagram

Description automatically generated with medium confidence

**The Demonstration**

<https://drive.google.com/file/d/1LY7b3NsZk8J1-TqVclX5gVObQ8-oN4pG/view?usp=sharing>

**Design**

My code works as follows:

* leftLights and rightLights are the two sets of 3 Leds.
* leftLedCount and rightLedCount keep track of which LED to turn on.
* leftContinousBlink and rightContinousBlinker keep track of how many times the LEDs turn on and when it reaches 3, the lights are solid and do not blink anymore.

My code first checks to see if SW1 is in the 0 position, if it is it sets turns off all leftLights and sets leftLedCount and leftContinuousBlinker = 0. It does the same for SW0 for the right LEDs. It then checks to see if both SW0 and SW1 are in the 1 position and sets both left and right LedCount and ContinuousBlinker to 0 and sets error to 1. Afterwards, it increments the clock. After 0.5 seconds, it first checks if error = 1, where it will turn off all lights and display E on the seven-segment display. If error is 0, it checks whether SW0 or SW1 is on. Next, it checks to see if the ContinousBlinker for that side is equal to 3, where it will turn the light solid and the lights will no longer blink, other wise it checks the current ledCount to determine which LED to turn on. It will then increment the LedCount or if the LedCount is at 3, it will set LedCount to 0 and increment the ContinousBlinker count. This will repeat itself until the ContinuousBlinker count is 3 or if the SW0/SW1 (whichever guard is triggered from earlier) is now in the 0 position.

Diagram

Description automatically generated  
