Tail Light FSM

Problem Statement

The 1965 Ford Thunderbird is noted for its spiffy tail light turn signal sequence. There are three lights on each side that operate in sequence to indicate the direction of a turn. Figure 1 shows the tail lights and Figure 2 shows the flashing sequence for (a) left turns and (b) right turns. (This material is derived from an example by John Wakerly from the 3rd Edition of *Digital Design*.)

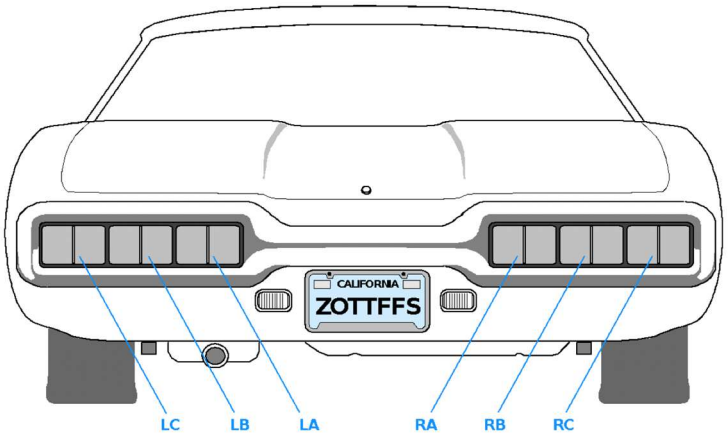

Figure 1. Thunderbird Tail Lights

The goal of this lab problem is for you to design a gate-level implementation of a turn signal **Moore FSM**, model it with **structural** SystemVerilog, and debug your design. Use only flip-flops, AND, OR, and NOT gates in your solution. (You may also use buffers, called **"buf"** in SystemVerilog, if you want to create another signal with a different name but the same value as a signal you already have.)

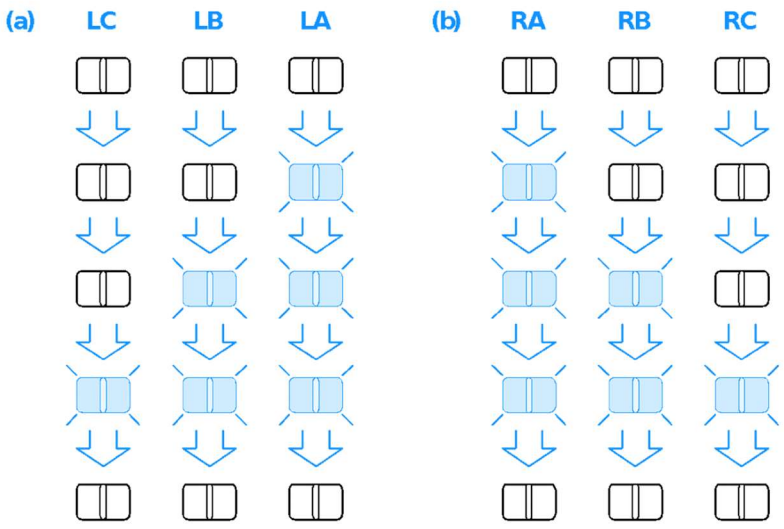

Figure 2. Flashing Sequence (shaded lights are illuminated)

You may need to copy a flip-flop module from elsewhere, and then instantiate it in your FSM multiple times for each flop in your system.

Start with the files below. Modify the lightfsm module but don't change the testbench or test vectors because that would mess up the hash. If you have questions about the desired timing of your FSM, see the test vector file for expectations.