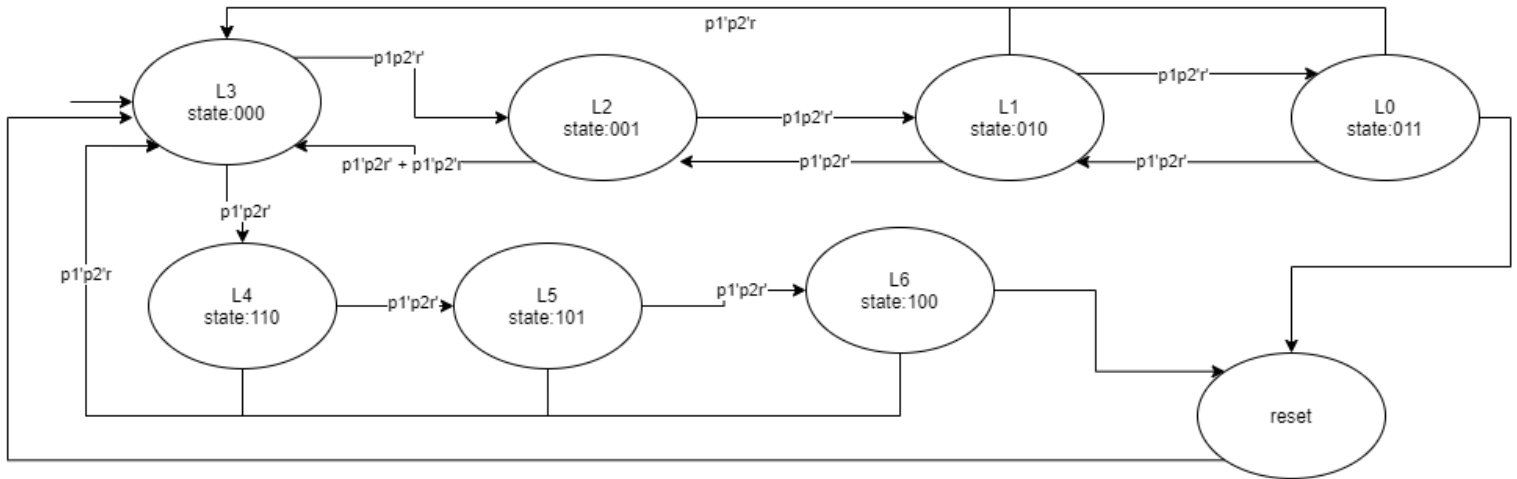


CSE232 Project I Report

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FSM Diagram:



Truth Table:

[illegible]

Derived Boolean expressions:

$$\begin{aligned} N3 &= (P1 * P2' * R' * S1' * S2' * S3') + (P1' * P2' * R' * S1' * S2' * S3) + (P1 * P2' * R' * S1' * S2 * S3) \\ &+ (P1' * P2 * R' * S1' * S2 * S3') + (P1' * P2 * R' * S1 * S2 * S3') + (P1' * P2' * R' * S1 * S2' * S3) \\ &= (P1 * P2' * R' * S1' * S3') + (P1' * P2 * R' * S2 * S3') + (P1' * P2' * R' * S2' * S3) \end{aligned}$$

$$\begin{aligned} N2 &= (P1 * P2' * R' * S1' * S2' * S3) + (P1' * P2' * R' * S1' * S2 * S3') + (P1 * P2' * R' * S1' * S2 * S3') \\ &+ (P1' * P2 * R' * S1' * S2' * S3') + (P1' * P2' * R' * S1 * S2 * S3') \\ &= (P1 * P2' * R' * S1' * S2' * S3) + (P1' * P2 * R' * S1' * S2' * S3') + (P1' * P2' * R' * S2 * S3') + \\ &(P2' * R' * S1' * S2 * S3') \end{aligned}$$

$$\begin{aligned} N1 &= (P1' * P2 * R' * S1' * S2' * S3') + (P1' * P2' * R' * S1 * S2 * S3') + (P1' * P2 * R' * S1 * S2 * S3') + \\ &(P1' * P2' * R' * S1 * S2' * S3) + (P1' * P2 * R' * S1 * S2' * S3) \\ &= (P1' * P2 * R' * S1' * S2' * S3') + (P1' * R' * S1 * S2 * S3') + (P1' * R' * S1 * S2' * S3) \end{aligned}$$

$$L0 = (S1' S2 S3)$$

$$L1 = (S1' S2 S3')$$

$$L2 = (S1' S2' S3)$$

$$L3 = (S1' S2' S3')$$

$$L4 = (S1 S2 S3')$$

$$L5 = (S1 S2' S3)$$

$$L6 = (S1 S2' S3')$$

Report:

The circuit uses 6 inputs two buttons for each player a reset button and a 3 bit value from the state register and it has 10 outputs one for each LED and 3 bit value that goes to the state register to determine the next state the state changes when any of the three buttons is pressed and the next state depends on the current state and which button is pressed when the circuit is turned on the middle LED indicated as LED3 is on, pressing the B1 button causes the LED to shift

to the left (Ex: if LED3 is on and B1 is pressed LED2 turns on), pressing the B2 button causes the LED to shift to the right (Ex: if LED3 is on and B2 is pressed LED4 turns on). If any of the LEDs 0 or 6 are turned on the circuit resets and start from the beginning.

The circuit works best on a 16 Hz clock.

Bugs: couldn't solve the problem of pressing the buttons for a long time

The Circuit:

