**Board state machine**  
Rand\_state generates a random state at every clock cycle.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | RESET | STOP | LOAD | START |
| Next state condition |  | Time\_trigger == 1 |  | (Time\_trigger == 1)  or  (board\_state == EMPTY\_BOARD\_STATE) |
| Board\_state | Load EMPTY\_BOARD\_STATE | [no change, board\_state = EMPTY\_BOARD\_STATE] | Load random state | If (button[i] & state[i]), then score\_trigger = 1 and state[i] = 0 |
| Board\_timer | Load STOP\_TIME | Timer = timer – 1  If (timer == 0), then time\_trigger = 1 | Load START\_TIME | Timer = timer – 1  If (timer == 0), then time\_trigger = 1 |

**Top\_module state machine**

Five\_button gives pulses in all states.

Display displays in all states.

|  |  |  |  |
| --- | --- | --- | --- |
|  | STOP | LOAD | START |
| Next state condition | any button is pressed |  | timer == 00 |
| Board | disable | disable | Enable |
| Scoreboard | [no change, because board is disabled] | Clear score to “000” | if (score\_trigger == 1), then score = score + 1 |
| timer | Load “00” | Load “60” | Timer = timer - 1 |