FSM DESIGN EXAMPLES

Fixing alarm duration

Previously, we studied an FSM for a keyless car entry system:

Inputs (buttons):

Outputs:
The implementation would be similar to this:

Question: how do we turn off the alarm after some period of time?

We need to replace ALARM state for countdown states:

ALARM T-1  ALARM T-2  ALARM O
Question: is there an alternative way?

Let's assume we have access to a count down counter with parallel load functionality:

```
  ↓
Counter
  ↓
LD  Z
```

Question: when should we make LD=1?

Answer: when panic button is pressed (P=1)
Question: how do we move to the LOCKED state when timeout occurs?

Hint: we need to transition from ALARM (originally 01) to LOCKED (originally 00)

Solution: force $S_0 = 0$ when we are in ALARM state ($S_1, S_0 = 01$), panic button has not been pressed ($P = 0$) and counter has timed out ($z = 1$)
Final circuit: