Computer Aided Design
Final Project

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1 Finite State Machine (FSM)

- **Check Time:** Initial state, Timer is set to zero, Notify flag is false.
- **Medication Alarm:** When time reaches a medication point, machine enters this state, and upon entering this state timer is incremented by 1, Alarm flag is also set to notify the user about the medication. If there is no sign of a confirm button pressed, the timer increments until it reaches the threshold for notifying others.
- **Medication OK:** If the user confirms that he/she took the medication before 15 minutes of alarm, machine enters this state in which notify flag is not set, and then machine enters Initial State.
- **Medication Miss:** After a medication alarm, if the user doesn't confirm that he/she took the medicine before 15 minutes of alarm going off, the machine enters this states in which a notify flag is set so that the machine can notify emergency contacts about this medication miss.

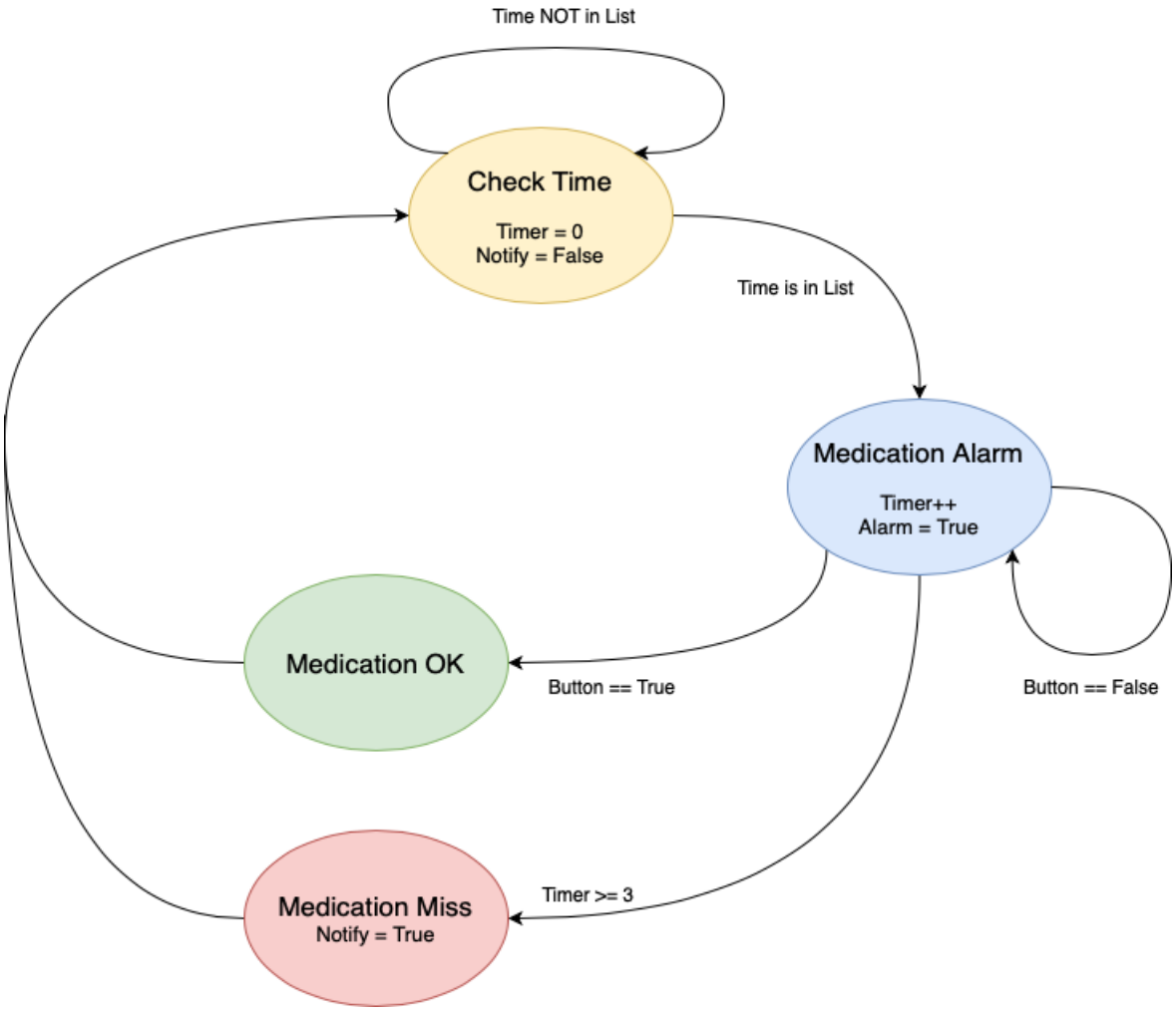
Time NOT in List
Check Time
Timer = 0
Notify = False
Time is in List
Medication Alarm
Timer++
Alarm = True
Medication OK
Button == True
Button == False
Medication Miss
Notify = True
Timer >= 3

Figure 1: FSM

2 Algorithmic State Machine (ASM)

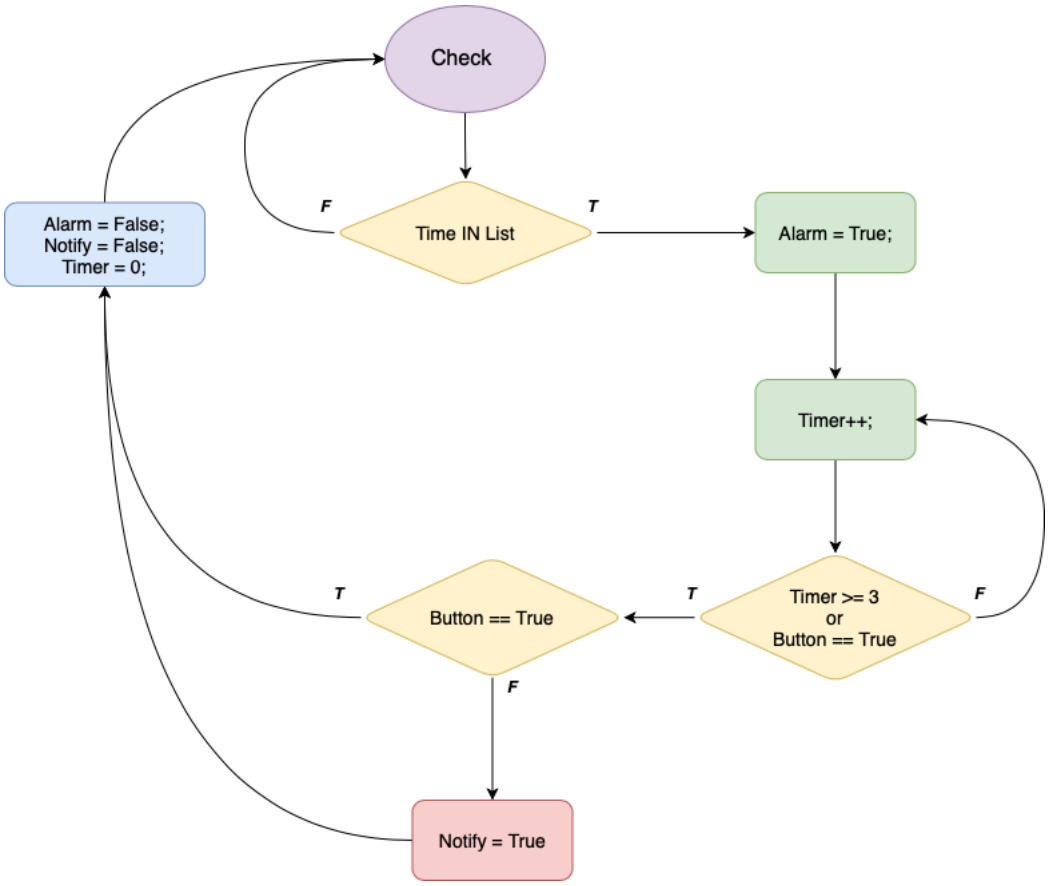

Figure 2: ASM

3 Verilog Implementation

Please find the "Code" folder attached for verilog files of implementation.

4 Simulation

For simulation, we added some arbitrary medications to the box and tried to work with the box, the first 4 medicines are missed and notify flag is set for each one of them after missing the deadline, but again for the next interval we

confirmed with the corresponding button and the notify flag remained off. For a better visual understanding, please check the next section.

Please check the "Testbench" folder attached for testbench code.

5 Waveform

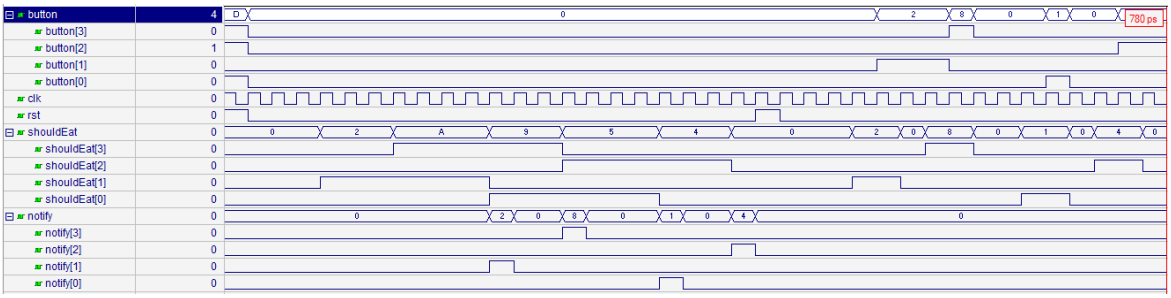

Figure 3: Waveform

For further detail, please check the "Waveform" folder attached for Waveform files and databases.