NMJ31804 – PRINCIPLES OF COMPUTER ARCHITECTURE
Semester 2, 2021/2022

LAB 2a: Finite State Machine (FSM)

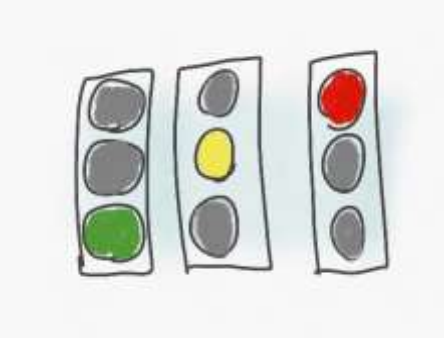
Introduction

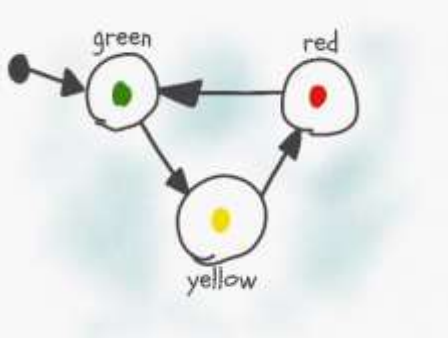
A Finite State Machine (FSM) is a computation model that can be used to simulate sequential logic, or, in other words, to represent and control execution flow. FSMs can be used to model problems in many fields, including mathematics, artificial intelligence, etc.

For example,

Traffic Light:

- ✓ **States:** Red, Yellow, Green
- ✓ **Transitions:** After a given time, Red will change to Green, Green to Yellow, and Yellow to Red





Objectives

i. To design a sequential process using FSM.
ii. To model a control unit for real application.

Task

A control unit (CU) handles control signals inside the machine by directs all input and output flows. This is to ensure the machine operates with correct sequence process without any conflict. Design a control unit for an electronic machine such as vending machine, washing machine or traffic light using FSM. You must include the process flow, state diagram and state table as the steps of design. Verify your design by using Quartus II.

Due date for submission: 12th. May 2022 (23:59hrs)

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