Assignment: Model-based Test Generation

Functional Requirements: Traffic controller

1. The traffic controller is for 4-way drive ways
    a. There are two traffic signal boards, one is for North-South direction, the other is for East-West direction
2. A signal board provides three-color traffic lights, green, yellow, and red
    a. There can be additional light for left turn (green '-> ' sign)
3. The initial color of signal is red
4. When the controller is turned on, both signal board illuminate red light for 3 seconds
5. After 3 seconds from initial state, the North-South board stays in red while the East-West board illuminates green light
6. The change of colors shall follow the order
    a. Green -> yellow -> red -> green -> …
    b. Red -> green -> yellow -> red -> …
7. Except for the initial 3 seconds in red, the time to be spent for each color is as follows
    a. Green: 10 seconds
    b. Yellow: 2 seconds
    c. Red: 12 seconds
8. When off signal is received, both signal board illuminates red light for 3 seconds and turned off
9. (Optional) Left turn signal is included
    a. After 5 seconds of green light, both green and left-turn sign shall be illuminated for 5 seconds

To do

1. Model the requirements in Finite State Machine
2. Write a NuSMV model from the FSM
3. Generate test cases from the NuSMV using state coverage criteria

Submit

1. FSM model (Graphical)
2. NuSMV model
3. Test cases and coverage analysis report
4. (Optional) prove that your model does not allow NS green and EW green at the same time

Due: 2022.05.31