CSCI910 Autumn 2020
Assignment #2
Due: by Sunday 19th July, 22:00

Marks: 15 marks

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1. Objective:

The purpose of this assignment is:

The objective of this assignment is to practice the usage of Coloured Petri Net

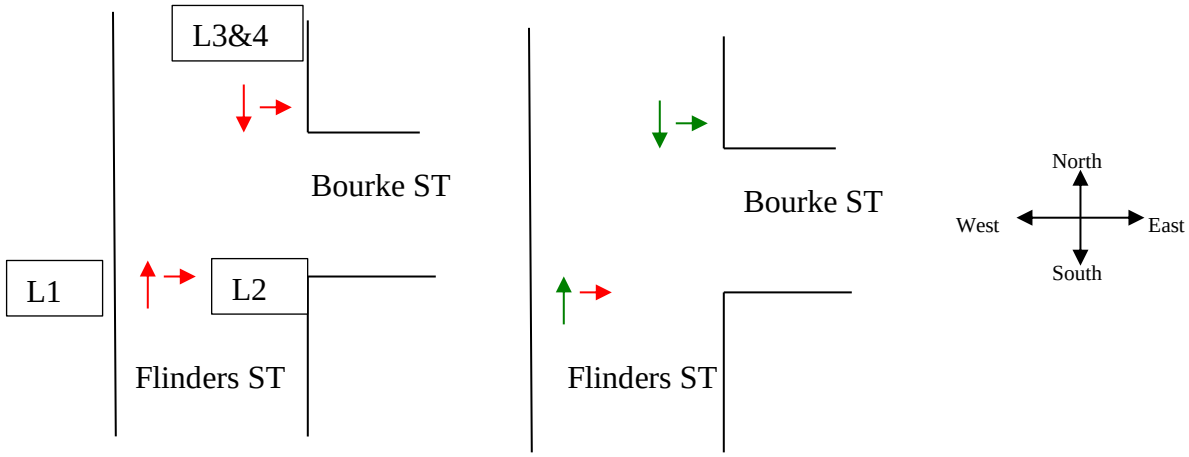
2. Problem Description:

Use a Petri Net to model the following two indicators for controlling cars across the street or turn to another street in an intersection based on the following requirements.

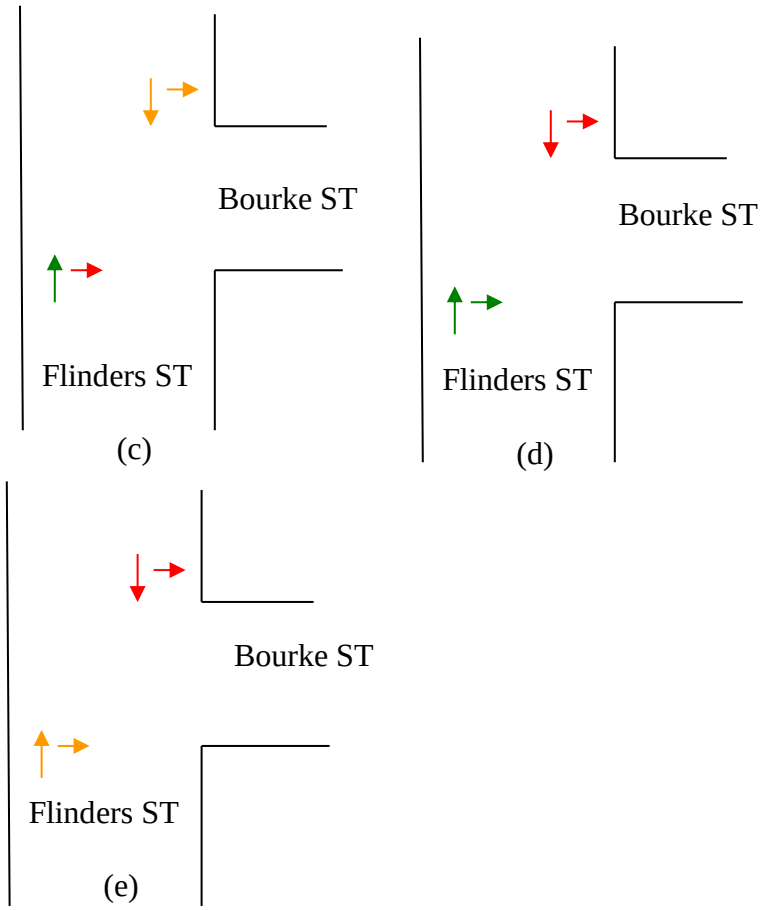
There is an intersection between Flinders Street and Bourke Street near North Wollongong Train Station. There are two traffic lights installed on Flinders Street to control the cars of the street to drive across the intersection, stop, or turn right/left to Burke Street. The statuses of the traffic lights are shown from Figure (a) to Figure (e). The transition sequence of the statuses is:

Figure (a) →Figure (b) →Figure (c) →Figure (d) →Figure (e) →Figure (a)

Please construct a Petri Net to model the two traffic lights on Flinders Street. You need to put the initial markings in your Petri Net to let two traffic lights be in the status of Figure (a).



(a) (b)



Descriptions of Status (a) and (b) are as follows. You can easily get the meaning of other three statuses.

(a). L1, L2 and L3&4 are red (the initial state);
(b). L1 and L3&4 turn to green at the same time, but L2 keeps on red;
(c). L3&4 turns to yellow, L1 keeps on green and L2 keeps on red;
(d). L3&4 turns to red first, then L2 turns to green. L1 keeps on green as well;
(e). L1 and L2 turn yellow, and L3&4 keeps on red. After
(e), it goes back to (a).

3. Submission Method:

Students must submit their final work of this assignment by a soft copy though the Moodle site.

- Submit a pdf file (TrafficLight.pdf) to clearly explain you Coloured Petri Net. The pdf file must include the mathematic definition, i.e., C=(P, T, I, O) and the initial marking, the definition of all colsets, and the graph of the Petri Net. The pdf file shall also include the state space analysis (can be a snapshot from CPT tool) of your Coloured Petri Net. **(10 marks)**

- Submit a cpn file (TrafficLight.cpn) to implement your Coloured Petri Net by using the CPN Tool. The cpn file shall contains two pages, i.e., the cpn network page and the state space analysis page. The states of your Petri Net must change exactly same as the specified order from (a) to (e). **(5 marks)**