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CMPT 440

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Traffic Light DFA Project

Abstract - In this document I will describe a bit about my project and what I hope it will accomplish. Also included are the state transition diagrams, and a state transition table.

Introduction – I wanted to create a project to simulate a simple 4 way traffic light. The inspiration for this came from us talking about it in class, as one of the example projects, and from another class, mobile security. In mobile security we discussed how often Traffic Lights have very weak security, and it is quite easy, although very illegal, to hack into a traffic light and change the light. Because of this I decided that a traffic light would be a simple, yet very real and very interesting example to look into.

Detailed System Description – This system will simulate the changing lights on a 4 way traffic light. This means that there are 2 sets of lights, one going north-south, the other going east-west. This means that this problem is essentially a union of 2 different DFAs, and the only accepting state is when one light is green and the other is red. While this does mean that it is very easy to reach an accepting state, a traffic light has to operate for a very long period of time, and without any errors. Another part of this project will be the sensors that trigger the light to switch. Each light has sensors that detect when cars are waiting for the light. When these sensors detect a car waiting, they need to communicate with the light and tell it to change. This means that there will be another DFA, to keep track of how many cars are waiting at each light, and using this info, tell the lights to change.

Conclusion – While this project is still in progress, it should be an interesting look at how a few DFAs are capable of interacting with each other, and how the input to one can determine the output of another.