Due Date:April 6th, 2017
Demo dates will be announced later.

EE142--Digital Design

Project 1: TRAFFIC LIGHT CONTROLLER

Project overview:

Your task in this project is to design and simulate a traffic light controller. You should follow the given hierarchical design below, but you will be required to design each component on your own. ***You are only allowed to use simple logical gates such as "or", "and", "xor", "nor", "nand", "inverters", and the components that you design***.

Project details:

Consider the crossroad in Figure 1. Your task is to design a traffic light controller for this crossroad.

In every road, there are loop sensors such that when there is a car in one of the roads, the sensor related to the given road gives '1', otherwise, it gives '0'. Traffic lights work with your design outputs, i.e., when you give '1', it means it is green, and when you give '0', it means it is red.

Please ensure the following rules for the controller:

- At any instant only one of the traffic lights can be green, and also they can not be all red at the same time.
- Priority of the roads is in the given order. For example, when there are cars in both I and II, traffic light in I should be green.

Grading policy:

- Working implementation: 40%
- Demo: 30%
- Report: 30%.

Please note that you are expected to design by using minimum number of gates.

Your report should include your design schematics, and it should clearly explain the design strategy, which is used in the project along with all necessary details (such as Karnaugh maps, block designs, hierarchical procedures, etc.). It is obvious that unethical behavior and plagiarism will not be tolerated. Please note that, your report must be **at most 4 pages long.**

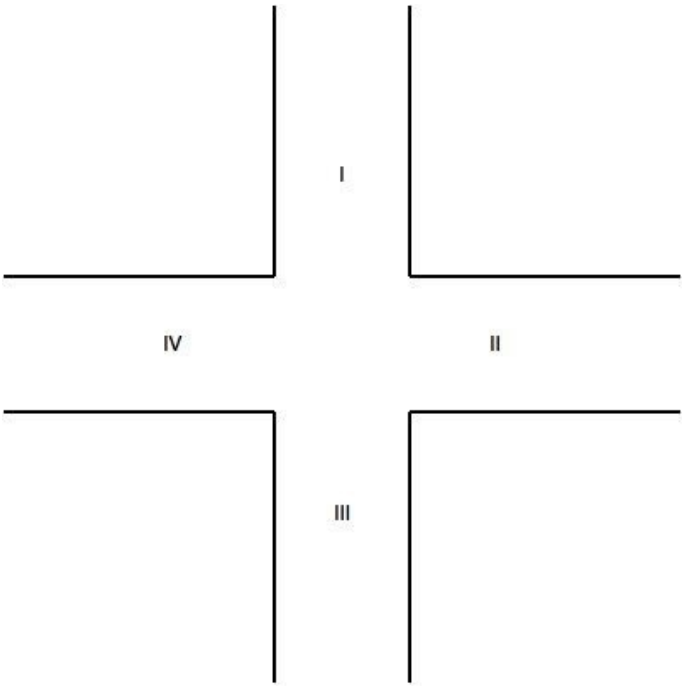

Figure 1