WIX1003
Computer Systems & Organization

Semester 1, 2023/24

Lab Assignment

Contents

01: Introduction

This lab assignment is part of the coursework requirement for the course WIX 1003 Computer Systems and Organization. This assignment is mini project where students will work in a group to solve a given problem. The details of the problem can be found in the following sections. At the end of the project, each group will present their solution to a panel of assessors.
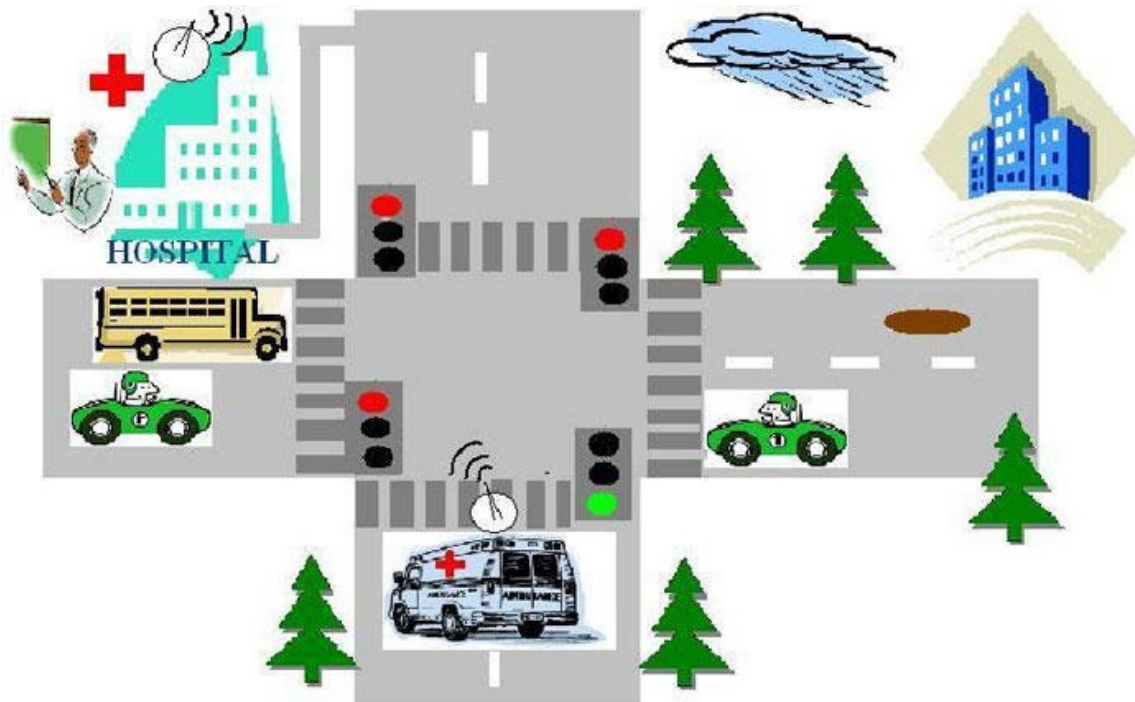
02: Objective

The objective of this lab assignment are as follows:

➢ To stimulate creativity and innovation among students
➢ To allow students to have better understanding of the studied subject

03: Background and Requirement

Status of Encounter

Your team is assigned with the task to develop a prototype of new computer system that capable to control a cross-junction traffic. Your team is required to product a working demo of a traffic light control system for this cross junction. The cross junction and traffic flow that are required to be controlled are given in the figure below.

Minimal Requirement

A microprocessor or microcontroller system is required to be used for this system. The system will allow for equal chance for users to exit and cross the junction. Each of the junction is to be controlled by a tri-colour traffic light indicator (green, yellow, red). The controller system will control the lighting of this tri-colour light indicator granting each junction the permission to exit and cross the junction without causing any accident or havoc. The indication of each of the colour is as follows:

Green : Permission to go   Yellow : Prepare to stop   Red : Stop and wait

Additional Feature Suggestion

A count down indicator will be helpful for user to know how long they will need to wait before permission to go is granted.

04: Submission

You are required to produce a simple report consisting the following:

- ➢ Component connection diagram
- ➢ Complete code of your system
- ➢ An explanation on the operation of your system
- ➢ Design consideration and system limitation

You are also required to demonstrate your system in a presentation session in **Week 14**. The presentation shall covers the following:

- ➢ The structure of your system
- ➢ The design consideration and system limitation
- ➢ The operation of your system
- ➢ Demonstration of a working system