

Coen-120 Final Exam Fall 2001

Your Name: _____

You have just been given the assignment to design a traffic light controller. The traffic signals at this intersection respond to sensors that detect the desired crossing of a vehicle and/or a pedestrian.

Your assignment is to create a controller that determines when to change the signal lights. The monitor should continuously display all pertinent information about the traffic controller information.

The North/South (N/S) traffic has 2 lanes in each direction, plus a left turn lane. The East/West (E/W) traffic has one lane in each direction, plus a left turn lane.

The signals should default to the N/S direction unless oncoming traffic or pedestrians are approaching from the E/W direction. Left turn sensors in the N/S direction may also affect the regular flow in the N or S direction.

The signal should allow 10 seconds from the last detection of an auto before changing the signal to the other direction. In no case should the signal in the E/W direction remain on for more than 2 minutes. The N/S signal should not remain on for more than 2 minutes if there are cars/pedestrians waiting in the E/W direction. The controller should allow at least 1 minute for a pedestrian to cross the intersection.

The controller should handle left turn lanes, and allow for the left turn traffic to go before the regular lanes of traffic. The left turn lights should only turn green when autos in that left turn lane are present. i.e. it is possible for only one left turn lane to be green. The left turn signal should turn green whenever there is an auto waiting and there is no opposing traffic from the opposite direction.

You may consider using the PIC serial device to simulate the vehicle/pedestrian detection sensors.

For the exam, create a Use Case for the controller, an Object Model Diagram, and an appropriate state chart for each object requiring one.

HINTS: Consider inheritance and multiplicity for the different sensors. Draw yourself a diagram to help you visualize the intersection.

You will have 3 hours to complete your design and testing. You should attempt to demonstrate your final product to me running under VxWorks. You must create a report of your exam and place it in the "StudentDropBox" directory on the server. Please copy your ENTIRE project folder to your Student account.

You should name your exam/project and report with your FirstInitial-LastName (e.g. nquinn).

Please turn this sheet in with your report.

"That's it, there ain't no more!"