

Final Exam Spring 2002 - CAR WASH SYSTEM

The Car Wash System has 6 stages in all:

Stage 1: Rinse#1 Stage 2: Soap Stage 3: Wash Stage 4: Wax Stage 5: Rinse#2 Stage 6: Dry

The Car Wash System is automated, wherein the user selects 1 of 4 modes of operation.

The 4 modes of operation are:

Mode 1: Economy Mode 2: Regular Mode 3: Premium Mode 4: Luxury

Depending on the mode been selected the car goes through the following corresponding stages.

Mode 1 - Economy: Rinse#1, Wash and Rinse#2

Mode 2 - Regular: Rinse#1, Soap, Wash and Rinse#2

Mode 3 - Premium: Rinse#1, Soap, Wash, Rinse#2 and Dry

Mode 4 - Luxury: Rinse#1, Soap, Wash, Wax, Rinse#2 and Dry

For Rinse#1&2 stages, the user has the option to set the water pressure (analog input) and temperature (analog input).

In the Dry state, again the user has the option of setting the air pressure (analog input).

Finally the user leaves the Car Wash.

The heart of the system is the controller which takes in inputs from the user and performs that particular mode accordingly. The controller should display the current state of the Car Wash. You may use either the screen or the PIC device to do this.

There is a drive mechanism moving the cars through the car wash moves at a constant rate of 1ft/sec. The stage sensors (shown below) are spaced 5 feet apart. (The average automobile is 7-10 feet long, but may be shorter or longer).

At any instant of time the car may be in more than one stage.

There are 2 sensors at each stage, one at entry and one at exit which give the status of the car in the car wash.

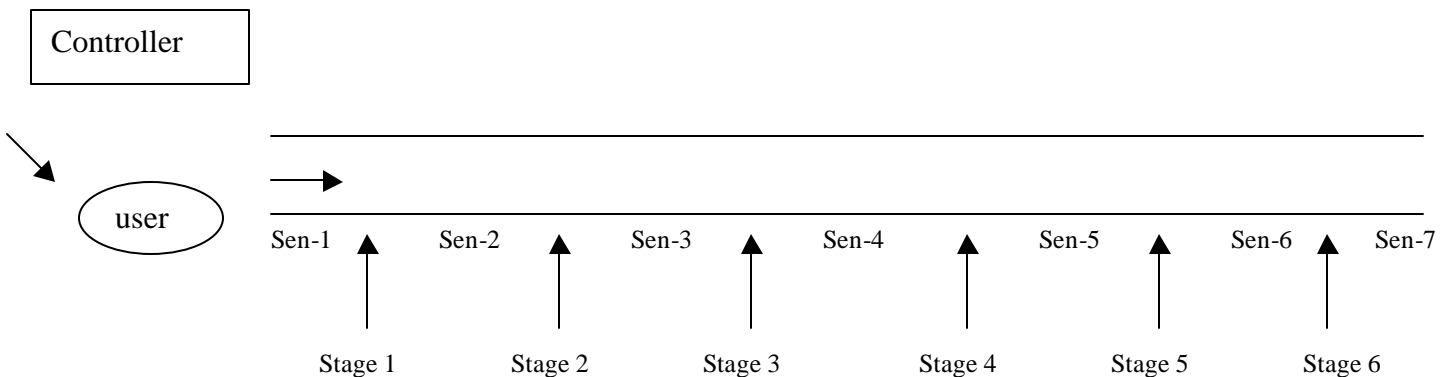
The exit sensor of one stage acts as the entry sensor to the next stage.

Assumptions:

Assume the Car washes only one car at a time.

If another car attempts to come in while the car wash is occupied, it has to wait.

When the car wash is free, the waiting car is notified and it goes ahead into the process.



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

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).

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