

**The British University in Egypt
Faculty of Informatics and Computer Science**

Year Three After Prep 2019-2020



19CSSE03H

Software Development for Real-Time Systems

Automobile Management System

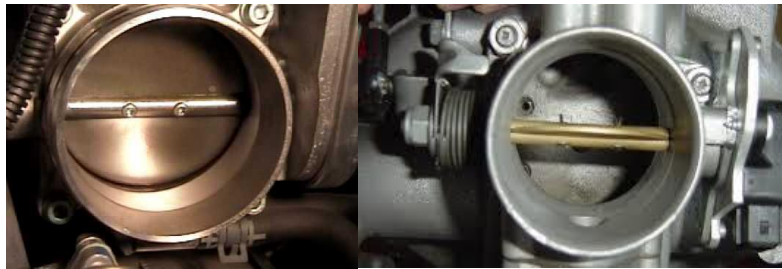
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Problem Definition:

The Automobile Management System is a real time system that consists of electrical sensors and mechanical parts composed together in order to work with one another to reduce the driver's strain while driving on long journeys. On the other hand, the system comes equipped with a numeric keyboard as an input, and CRT output monitor that tracks the vehicle's mileage and average fuel consumption, and the average speed in a certain trip upon user's selection. Therefore, Real Time Systems shall be taken into development and modeling conception as for this study.

The Cruise Control System, is a system that maintains the vehicle's speed upon user's selection meanwhile the engine is running and its current gear is the top gear, it maintains the speed by controlling the throttle body through the actuator attached to it by a range of volts from 0 to 8 (closed – fully opened) in order to hold the car at that desired speed, as well as the vehicle's speed can be increased dynamically by depressing on the accelerator regardless of the current selected speed to be cruised on, but once the pedal is held out, the vehicle will be running back on the previously cruised speed. And vice versa for the braking pedal, until the speed reaches the previously selected cruising speed.



Closed (0)

Open (8)

Throttle body [1]

Also, the system will be outputting the speed on a speedometer that measures the speed and distance by counting the revolutions it receives from the drive shaft sensor to draw the actual speed after the effect of the tire size and wear.

The system will be monitoring the vehicle's mileage, and notify the driver of determined factory scheduled maintenances, such as regular oil and filter changes, and such on.



The display.

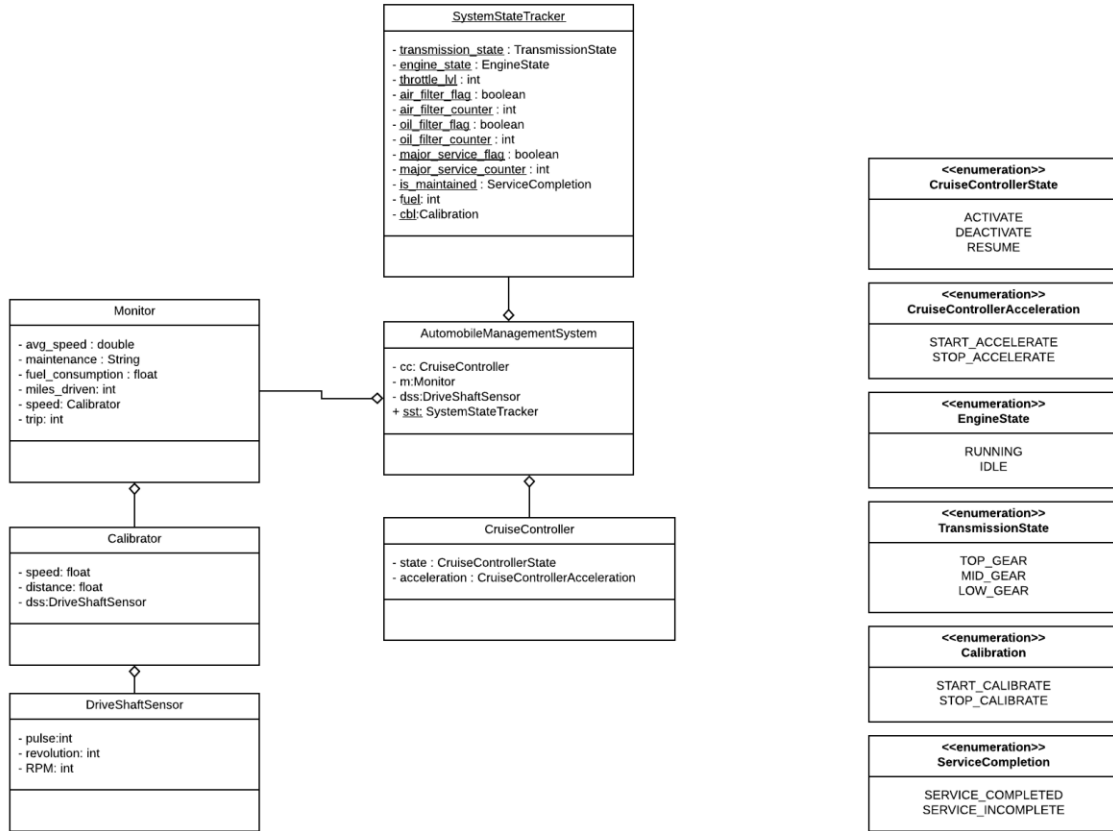
Required Diagrams:

Usecase Diagram:

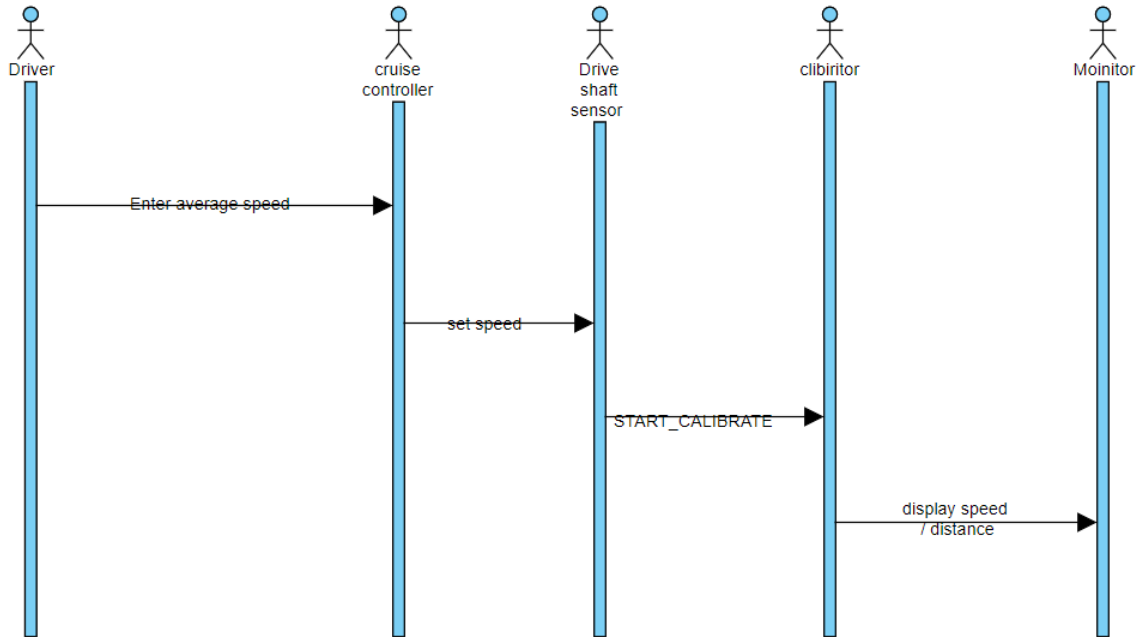


Automobile Management System Use Case Diagram

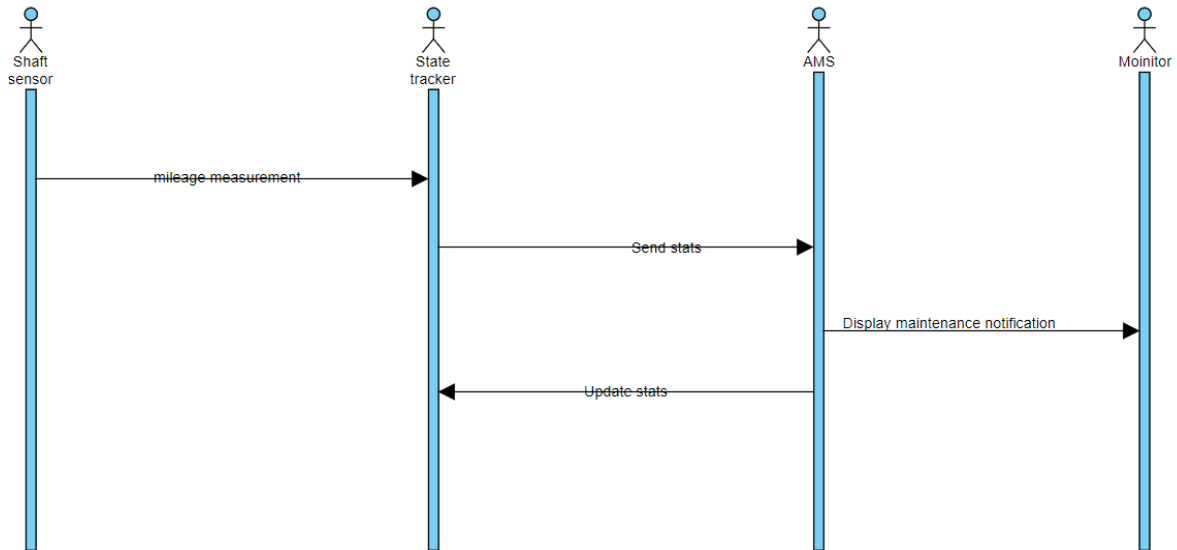
Class Diagram:



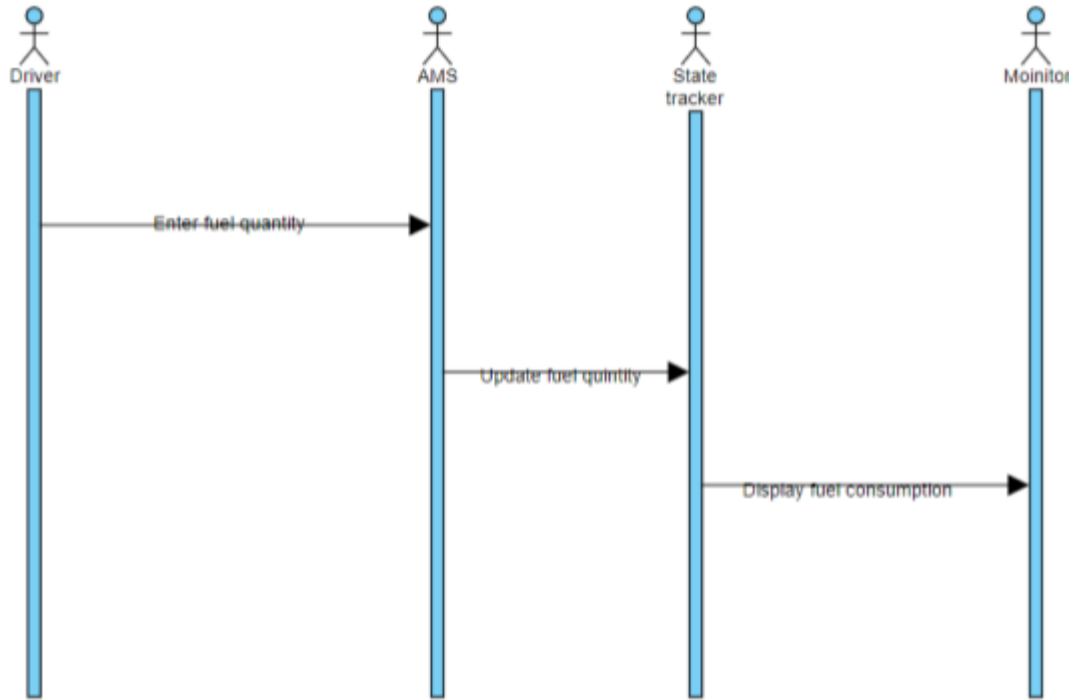
Sequence Diagram:



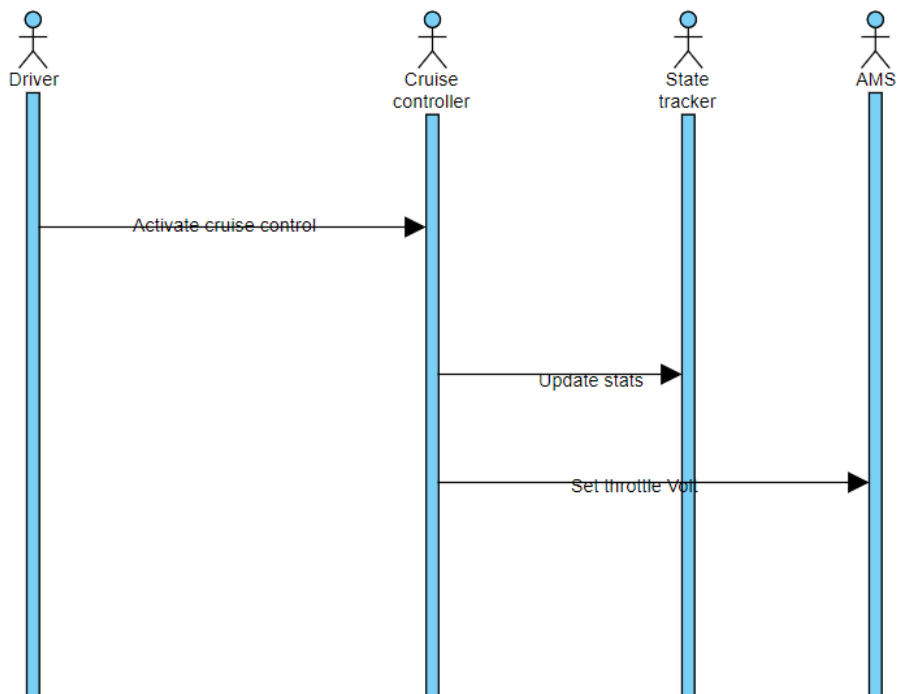
Average Speed Sequence Diagram



Mileage Measurement Sequence Diagram

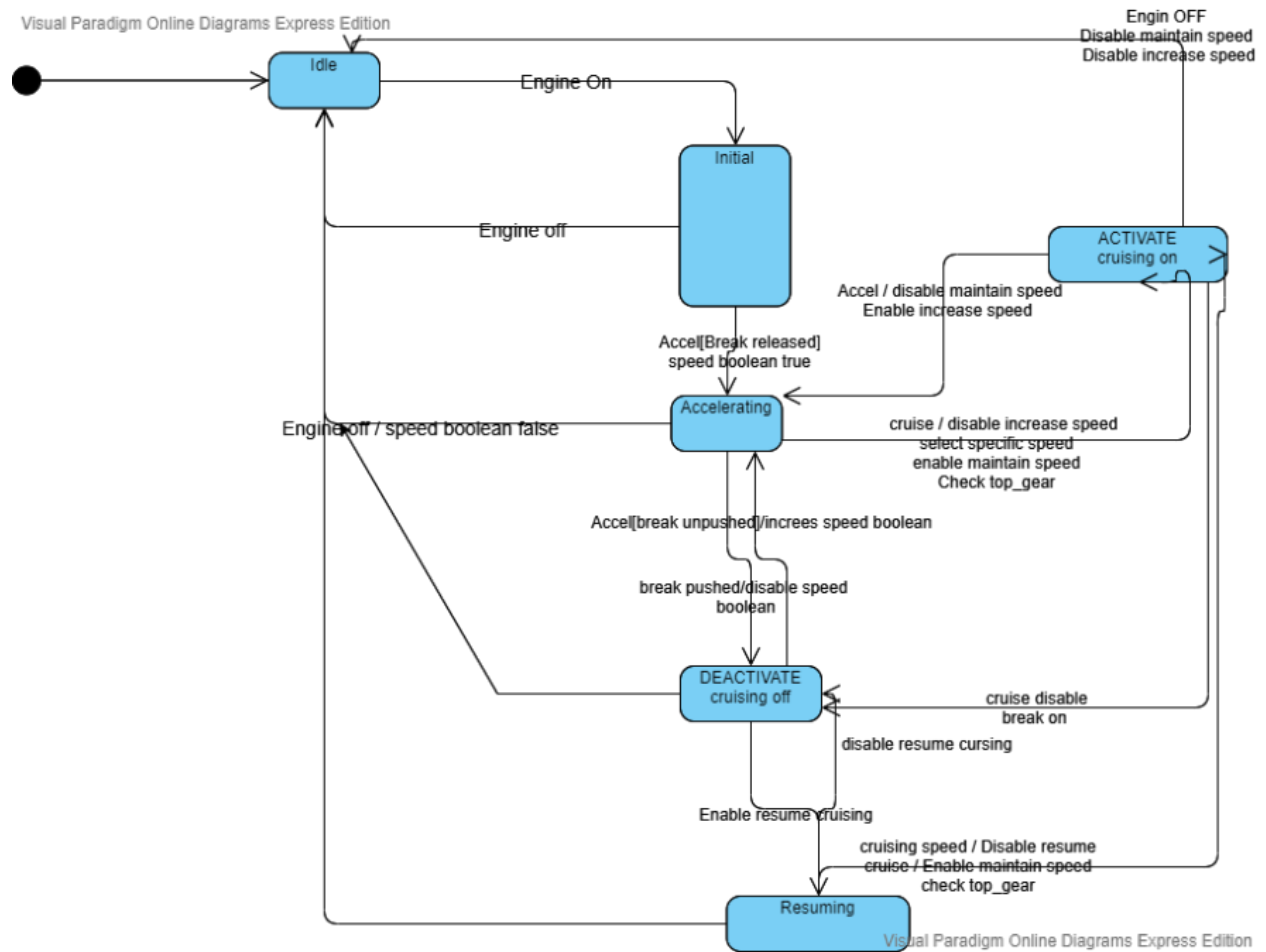


Fuel Quantity Sequence Diagram

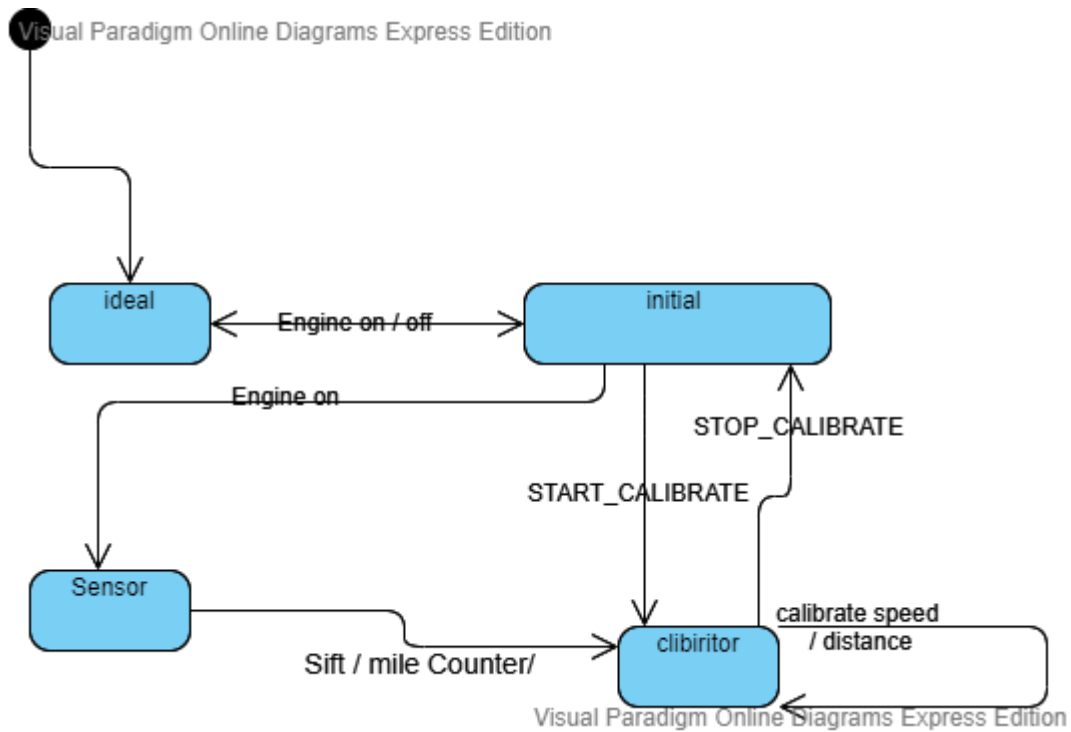


Throttle Sequence Diagram

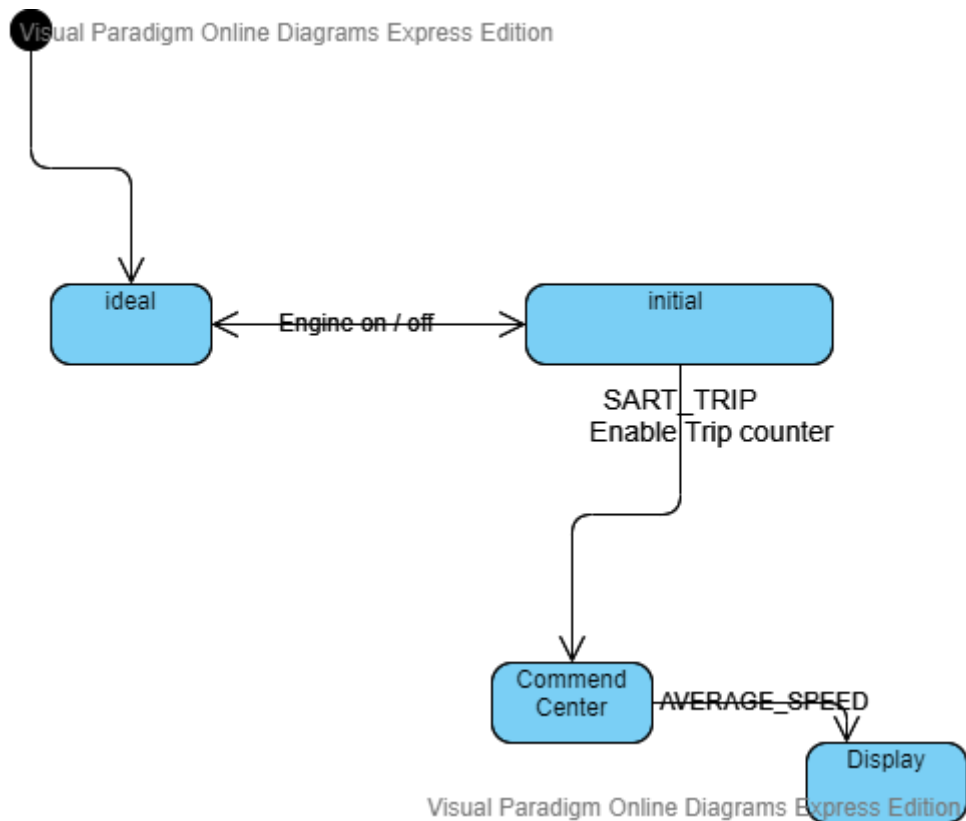
State Machine Diagram



Cruise Controller State Machine Diagram



Calibrator State Machine Diagram



Average Speed State Machine Diagram