CSE 522: Project

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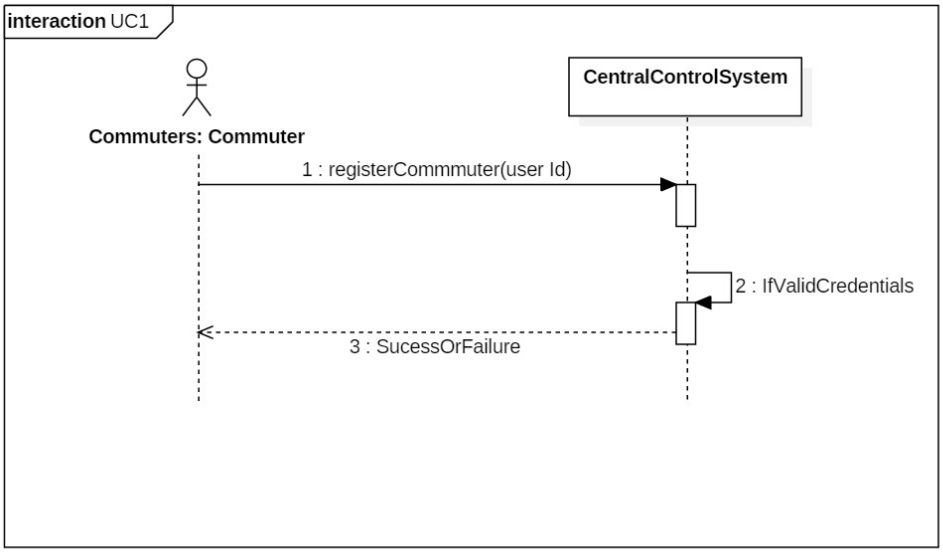
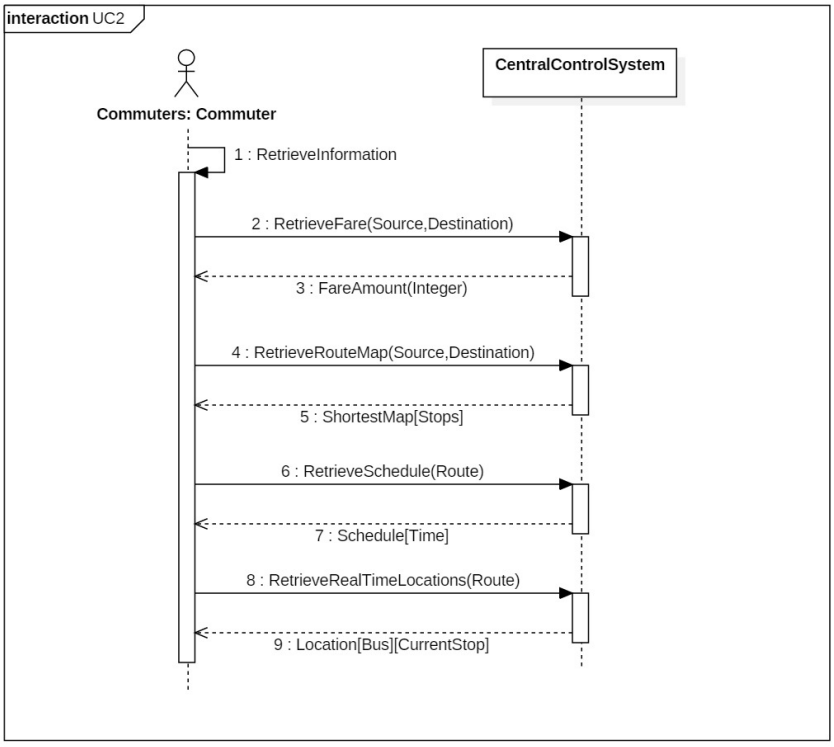
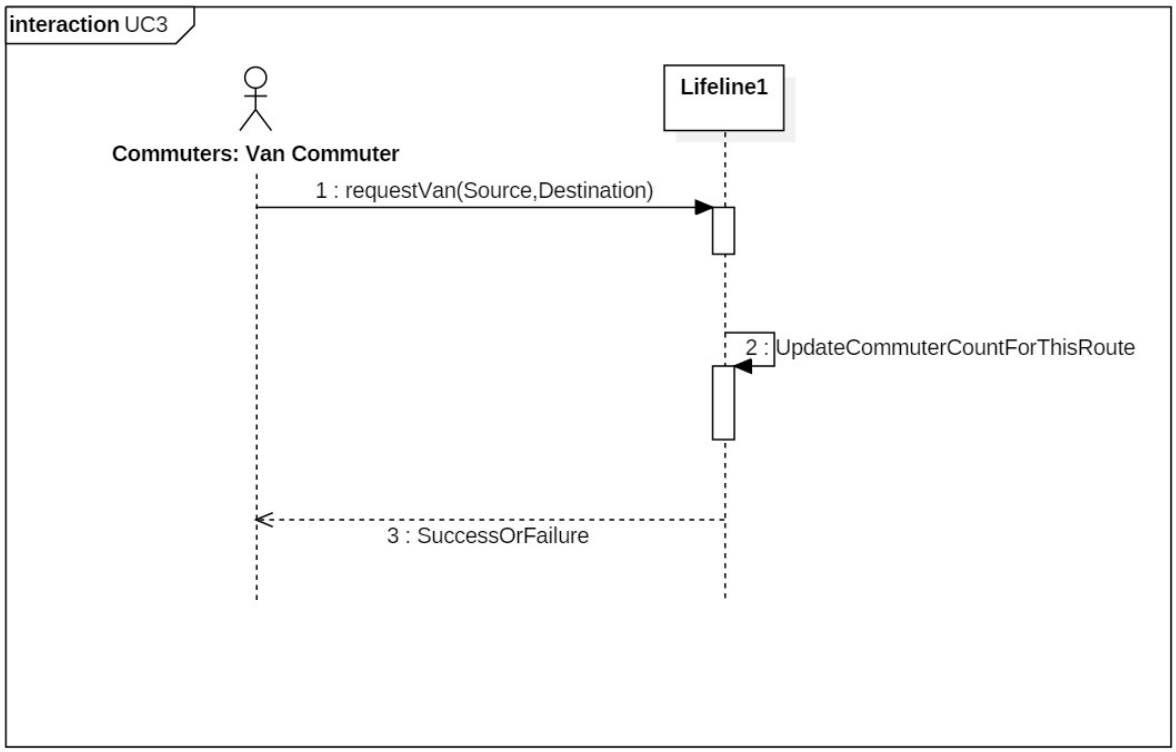
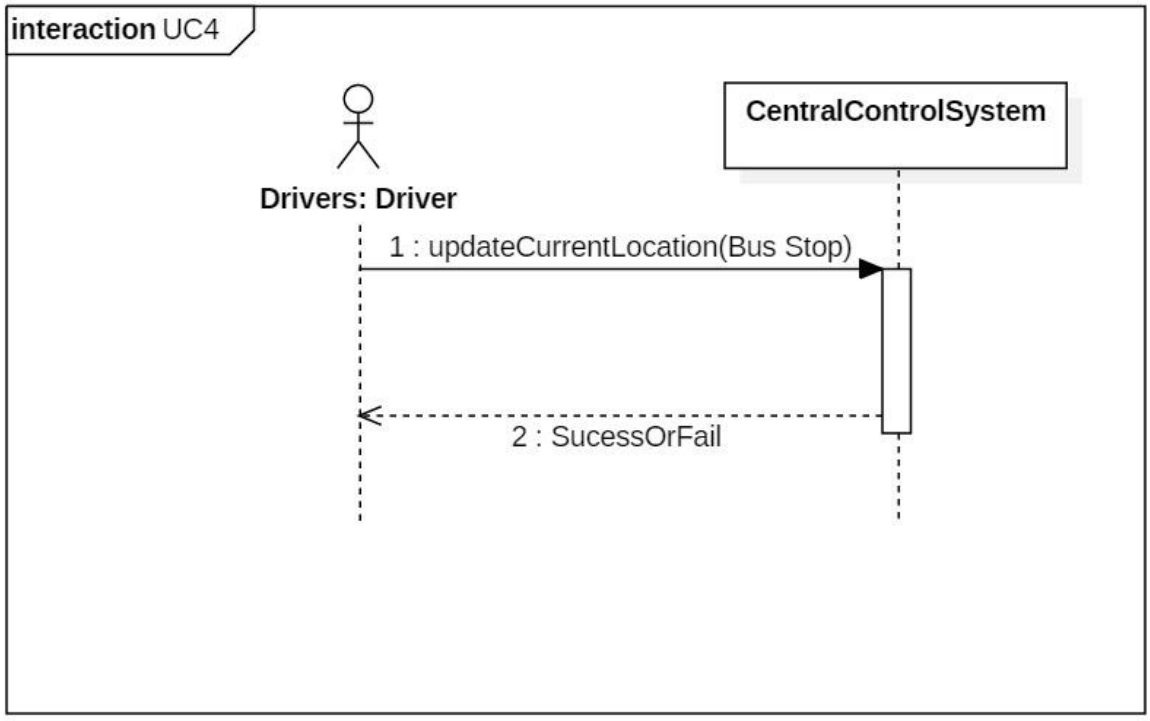
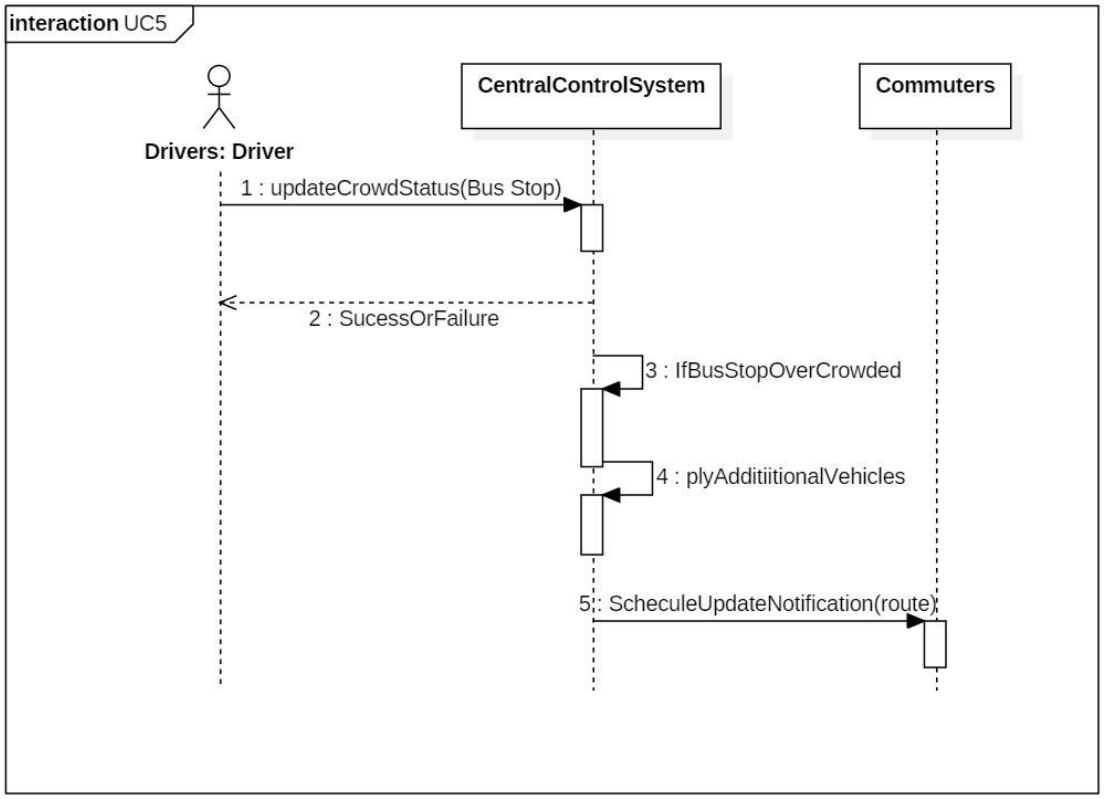
i. Interaction Diagrams

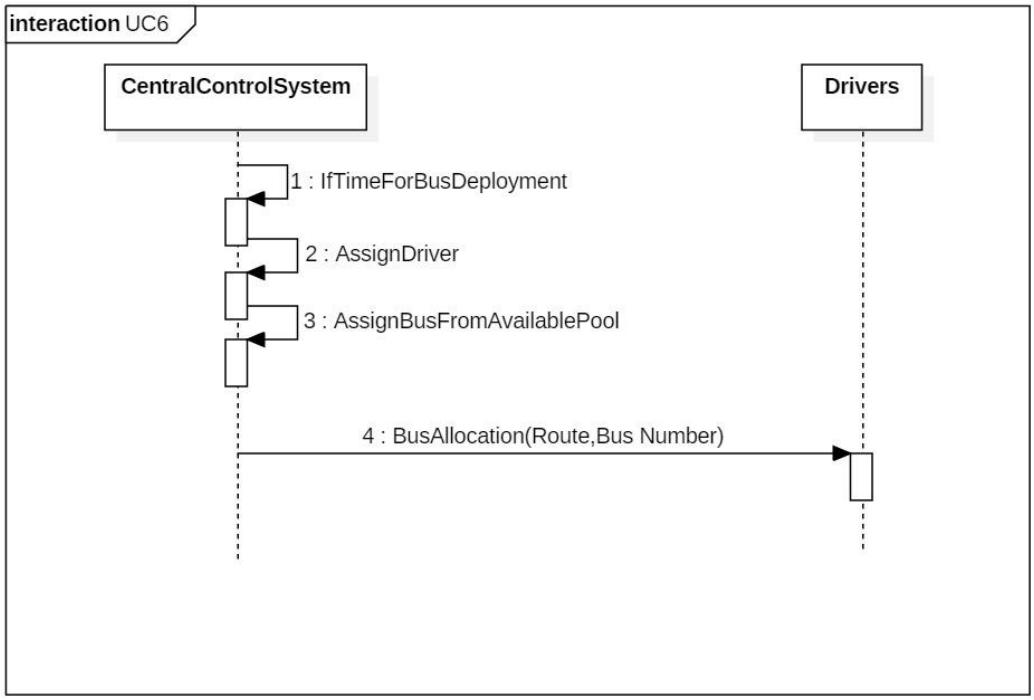


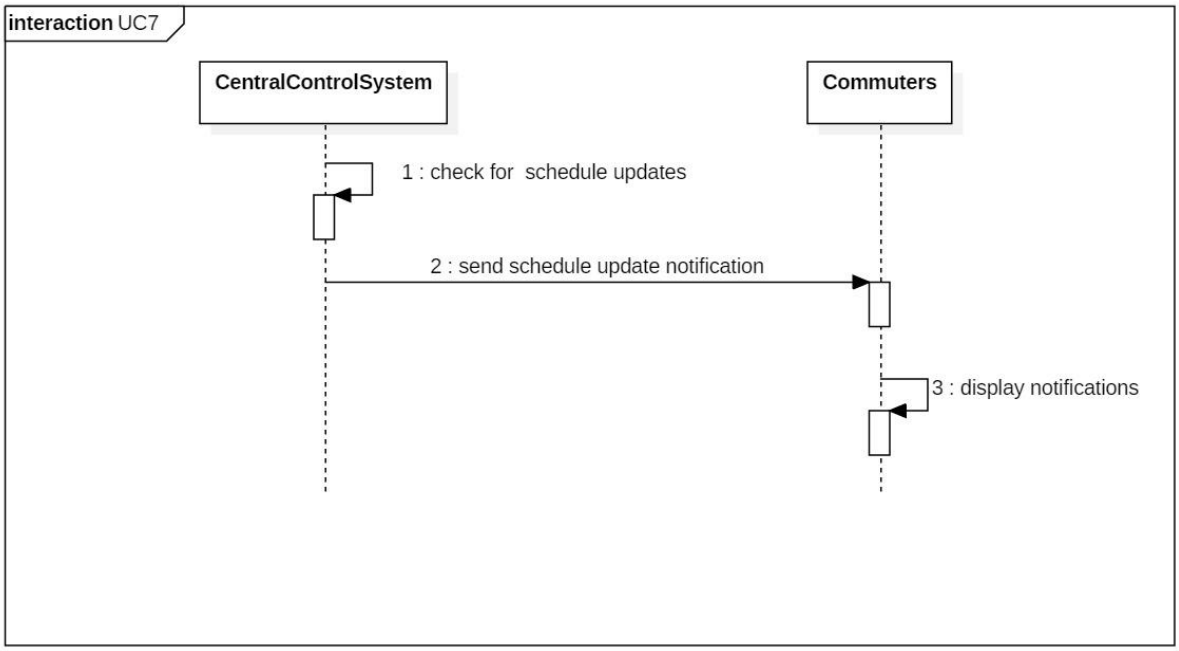


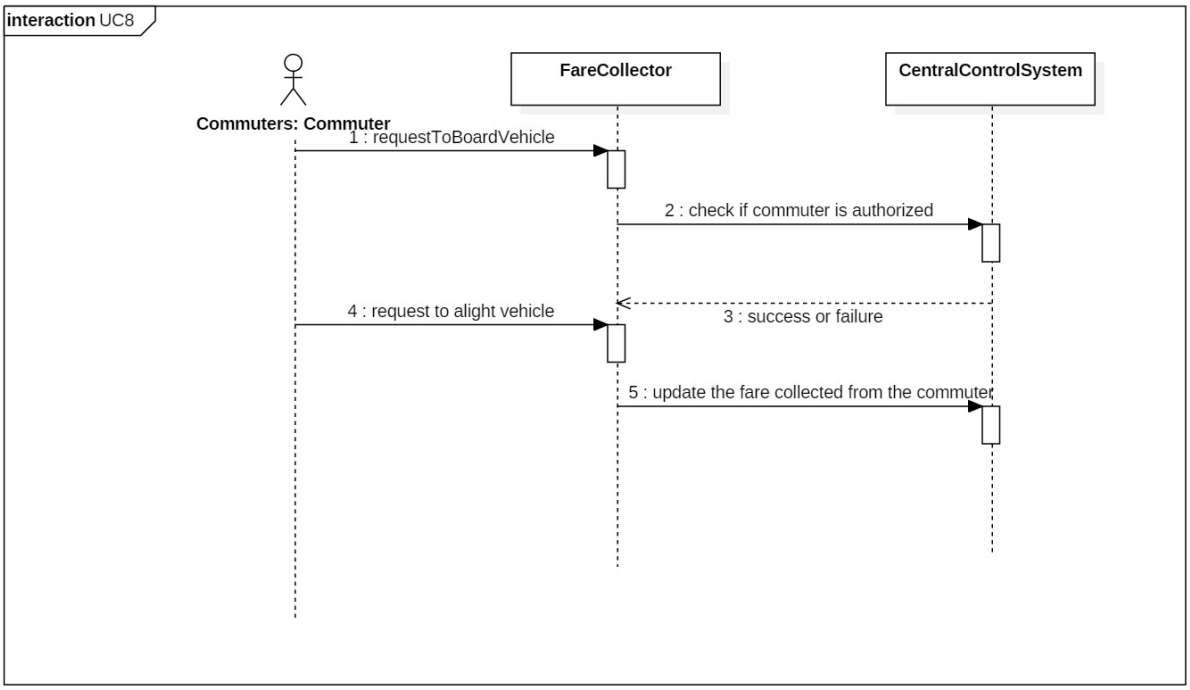

interaction UC3
Lifeline1
Commuters: Van Commuter
1 : requestVan(Source,Destination)
2 : UpdateCommuterCountForThisRoute
3 : SuccessOrFailure

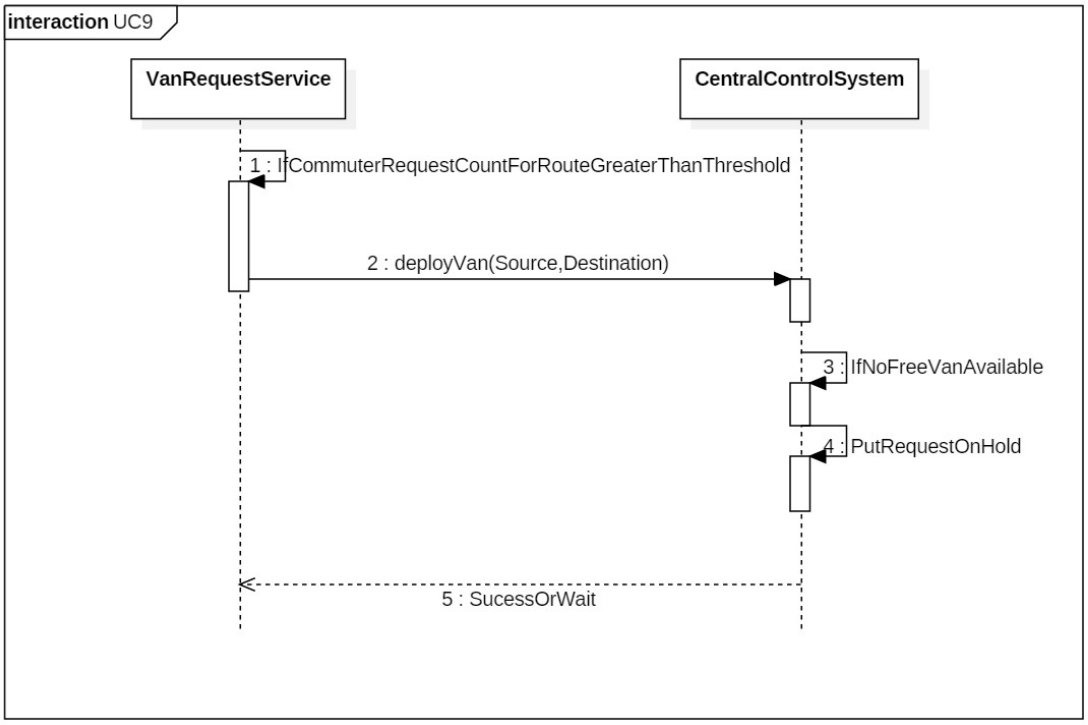

interaction UC4
CentralControlSystem
Drivers: Driver
1 : updateCurrentLocation(Bus Stop)
2 : SucessOrFail

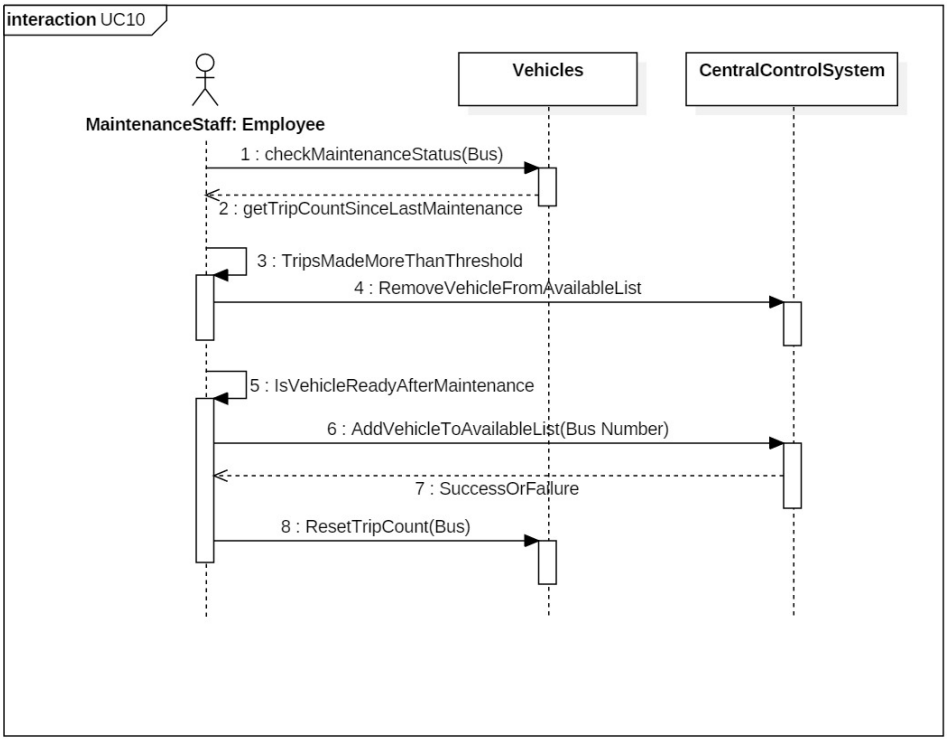

interaction UC5
Drivers: Driver
CentralControlSystem
Commuters
1 : updateCrowdStatus(Bus Stop)
2 : SucessOrFailure
3 : IfBusStopOverCrowded
4 : plyAdditiitionalVehicles
5 : ScheculeUpdateNotification(route)


interaction UC6
CentralControlSystem
Drivers
1 : IfTimeForBusDeployment
2 : AssignDriver
3 : AssignBusFromAvailablePool
4 : BusAllocation(Route,Bus Number)


interaction UC7
CentralControlSystem
Commuters
1 : check for schedule updates
2 : send schedule update notification
3 : display notifications


interaction UC8
Commuters: Commuter
FareCollector
CentralControlSystem
1 : requestToBoardVehicle
2 : check if commuter is authorized
3 : success or failure
4 : request to alight vehicle
5 : update the fare collected from the commuter


interaction UC9
VanRequestService
CentralControlSystem
1 : IfCommuterRequestCountForRouteGreaterThanThreshold
2 : deployVan(Source,Destination)
3 : IfNoFreeVanAvailable
4 : PutRequestOnHold
5 : SucessOrWait


interaction UC10
MaintenanceStaff: Employee
Vehicles
CentralControlSystem
1 : checkMaintenanceStatus(Bus)
2 : getTripCountSinceLastMaintenance
3 : TripsMadeMoreThanThreshold
4 : RemoveVehicleFromAvailableList
5 : IsVehicleReadyAfterMaintenance
6 : AddVehicleToAvailableList(Bus Number)
7 : SuccessOrFailure
8 : ResetTripCount(Bus)

ii. Modifications to Class Diagram:

The following two new classes have been added to the Class Diagram as per suggestion to increase the classes in the project.

a. VanRequestService
b. MaintenanceStaff as an implementation of Employees interface

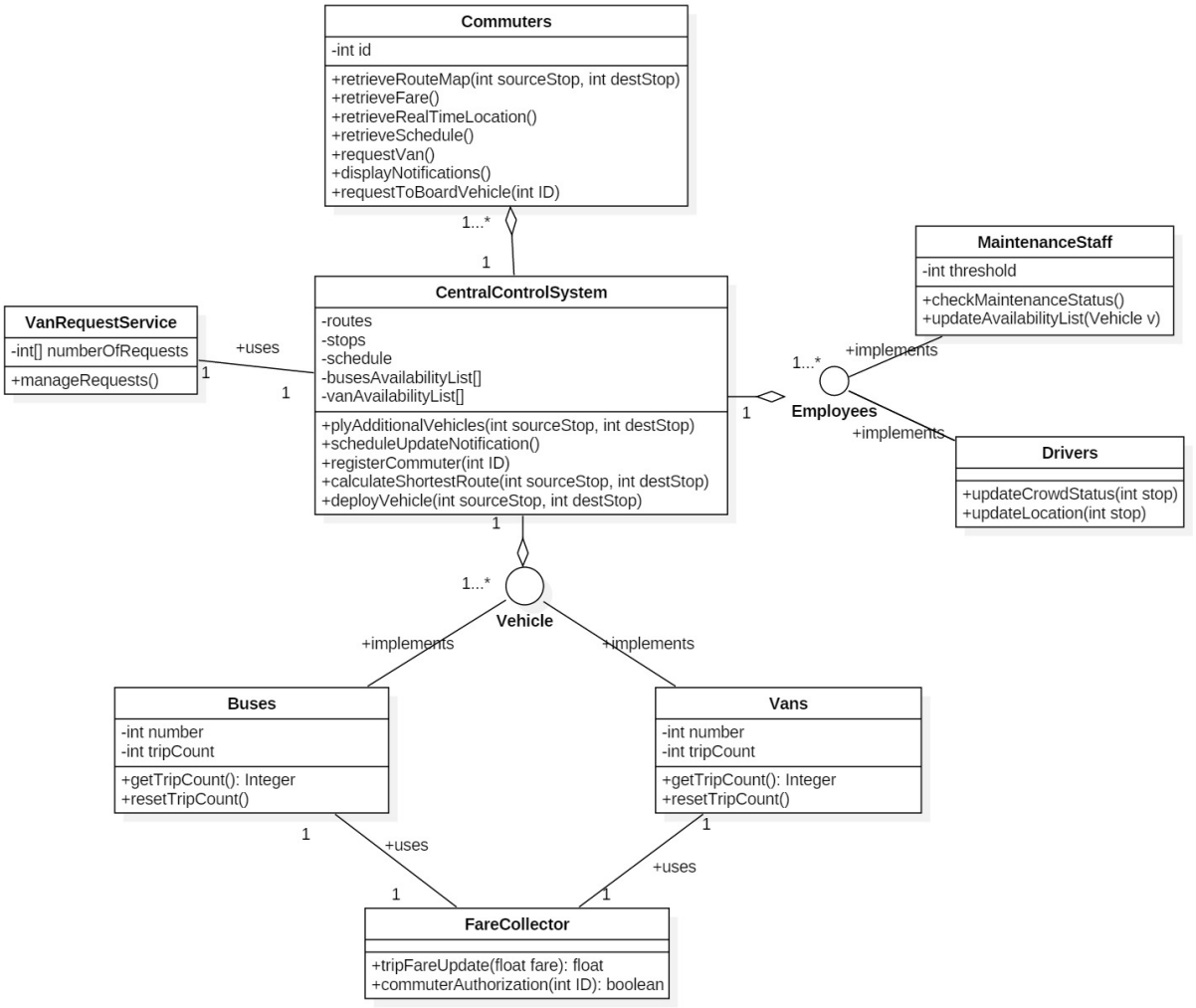
VanRequestService will handle requests from Commuters for vans during odd hours when the bus frequency is low or closed. It will wait for an appropriate time or number of requests before deciding to deploy a van to the requested stop. It will interact with the CentralControlSystem and Commuter classes.

MaintenanceStaff will decide when a vehicle is due for servicing and will request the CentralControlSystem to deliver the particular vehicle. After the servicing is done it will allocate the vehicle back to the system to use for deployment.

Accordingly, the use case diagram has been updated as follows, some use cases have been merged:

ID	Use Case	Actor
UC1	Register commuter to the transport system	Commuter
UC2	Retrieve route map, fare, schedule and real time location	Commuter
UC3	Request van	Commuter
UC4	Post real time location updates	Driver
UC5	Ply additional vehicles depending on crowd status	Driver, CentralControlSystem
UC6	Deploy vehicles as per schedule, assign a driver to the vehicle	CentralControlSystem
UC7	Send notifications for schedule updates	CentralControlSystem
UC8	Authorize commuters to ride the bus and update fare collected	Fare Collector
UC9	Manage requests for van	VanRequestService
UC10	Manage vehicle servicing system	MaintenanceStaff

All other notations like multiplicity annotations, attributes and relationships have been added to the Class Diagram.



Class Diagram

iii. Table for use-cases and classes

	Buses	CentralControlSystem	Commuters	Drivers	FareCollector	MaintenanceStaff	VanRequestService	Vans
UC1	-	registerCommuter()	-	-	-	-	-	-
UC2	-	calculateShortestRoute()	retrieveRouteMap(), retrieveFare(), retrieveRealTimeLocation(), retrieveSchedule()	-	-	-	-	-
UC3	-	-	requestVan()	-	-	-	manageRequests()	-
UC4	-	-	-	updateLocation()	-	-	-	-
UC5	-	plyAdditionalVehicles(), scheduleUpdateNotification()	-	updateCrowdStatus()	-	-	-	-
UC6	-	deployVehicle()	-	assignDriver(int busNumber, Route)	-	-	-	-
UC7	-	scheduleUpdateNotification()	displayNotifications()	-	-	-	-	-
UC8	-	-	requestToBoardVehicle()	-	commuterAuthorization(), tripFareUpdate()	-	-	-
UC9	-	plyAdditionalVehicles()	-	-	-	-	manageRequests()	-
UC10	getTripCount(), resetTripCount()	-	-	-	-	checkMaintenanceStatus(), updateAvailibilityList()	-	getTripCount(), resetTripCount()