IN5130 - Oblig I: Modeling

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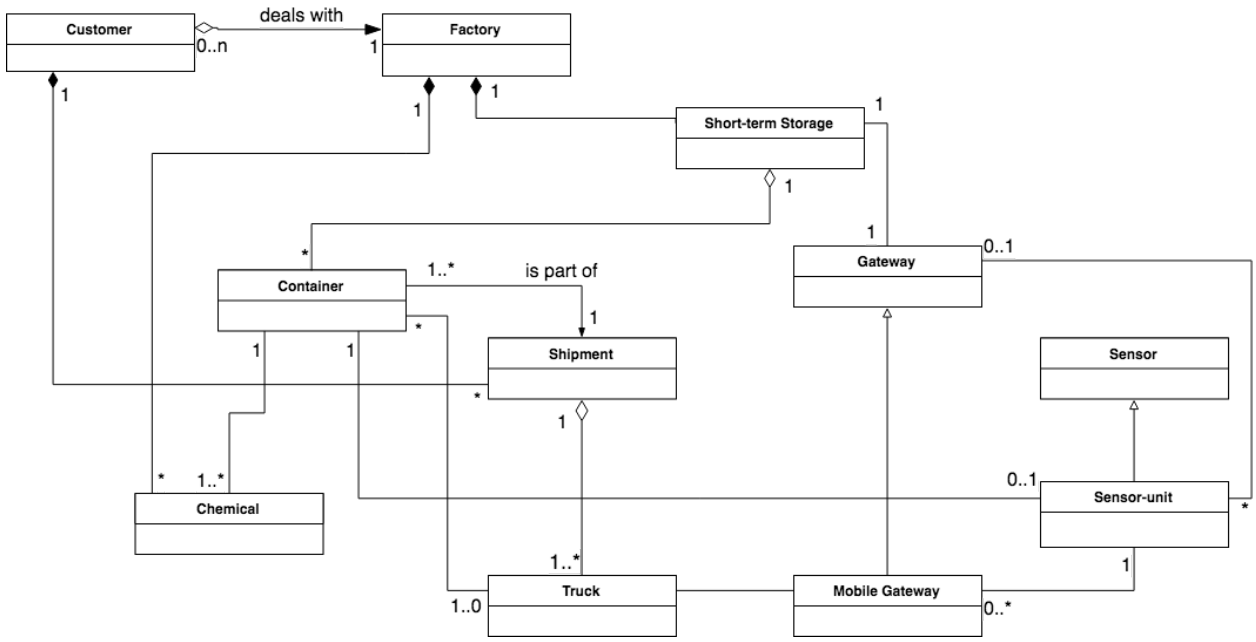
Question I:

a)



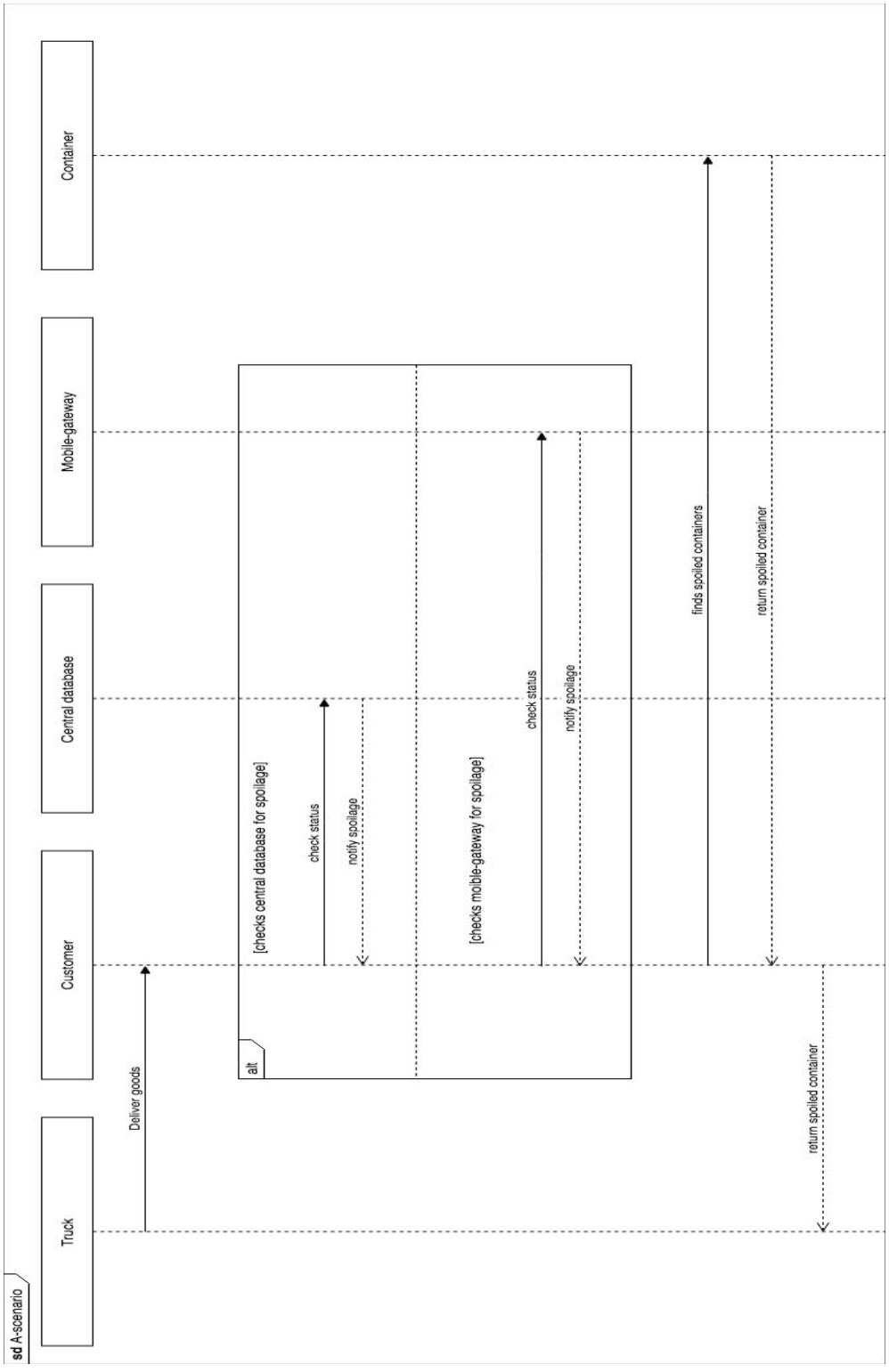
b)

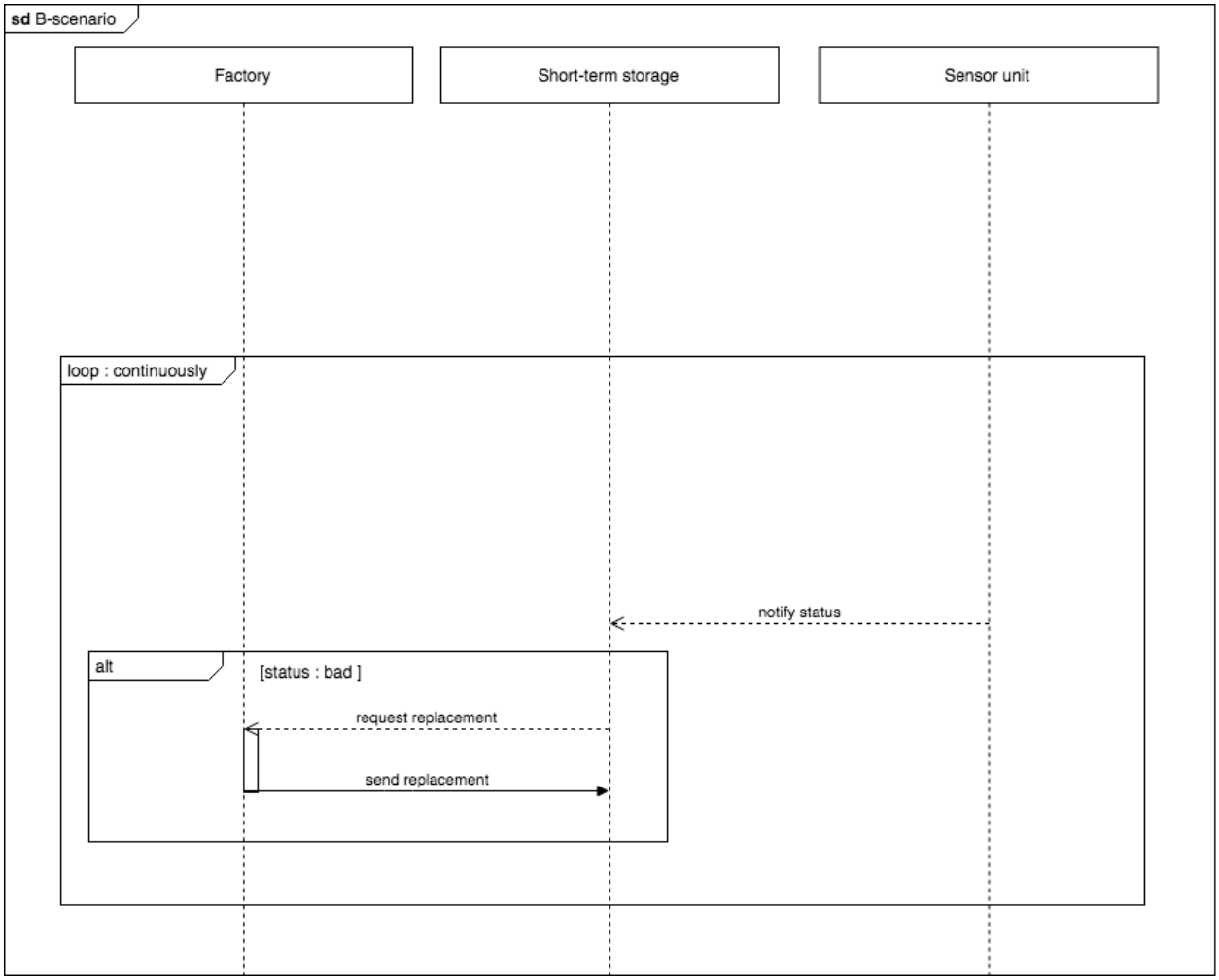
This model represents the relevant concepts as given in the description. Some assumptions were made, which are described below. The class diagram contains only the essential relations to ensure no construct deficit, which is therefore somewhat precise and does not have a lot of construct redundancy. One can say that the use of hierarchical use of mobile gateway and gateway may be a bit excessive, but as the name implies it showcases the different use cases between them.

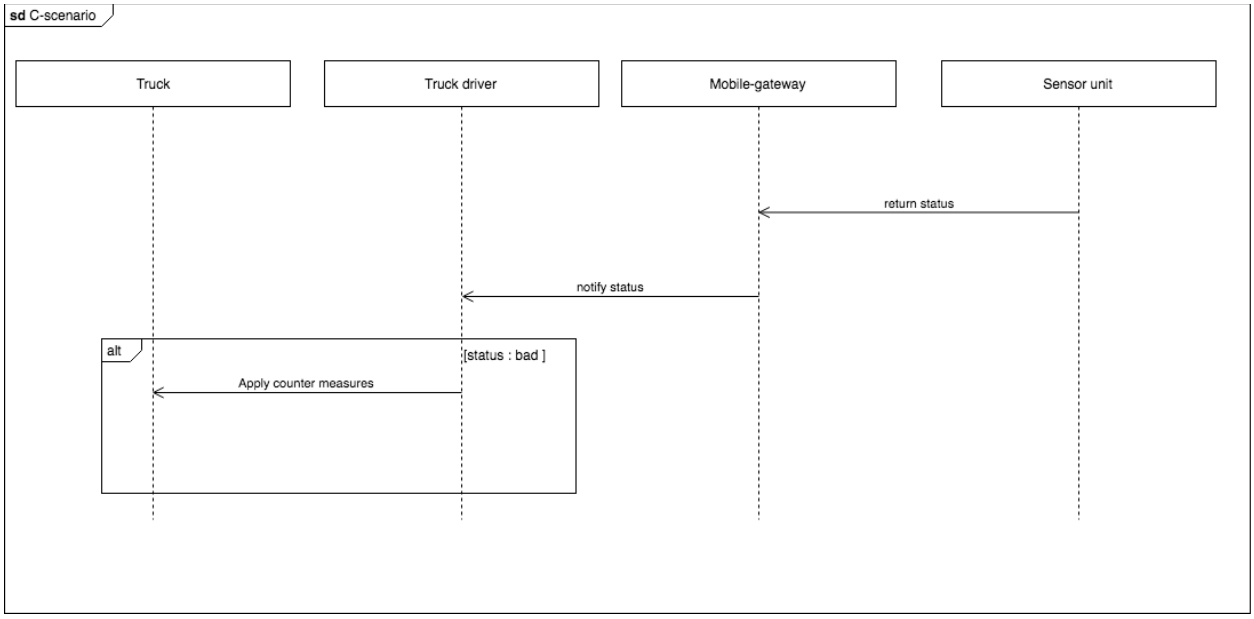
Assumptions:

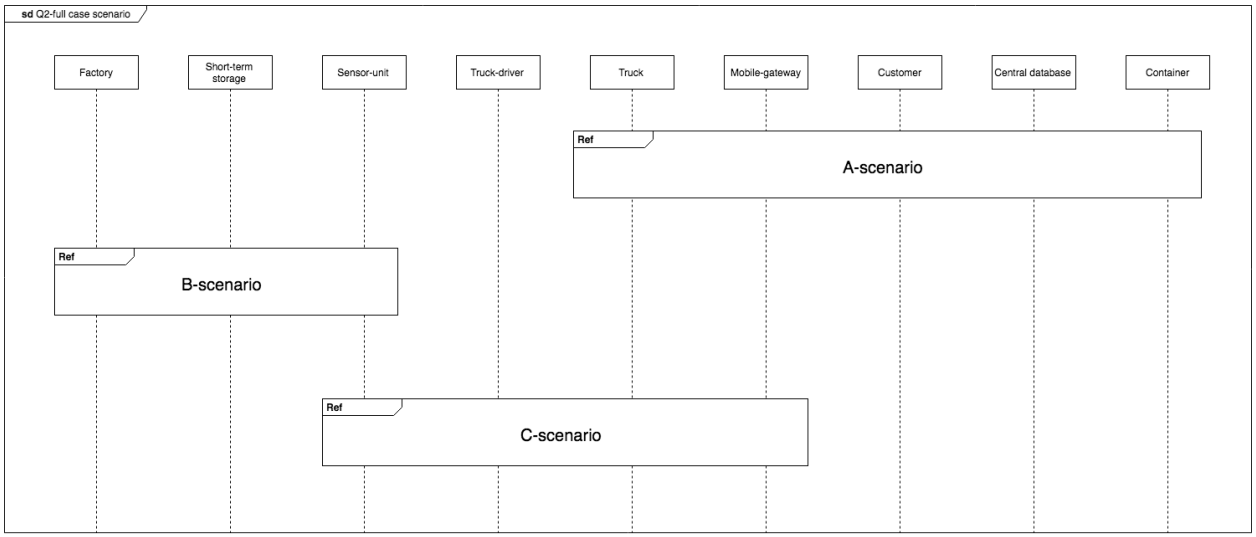
- Customer shipment / truck relations is not needed as it creates redundancy.
- Differentiates gateways between a mobile and stationary unit, as it would not be implied that both units behaves the same.

Question II

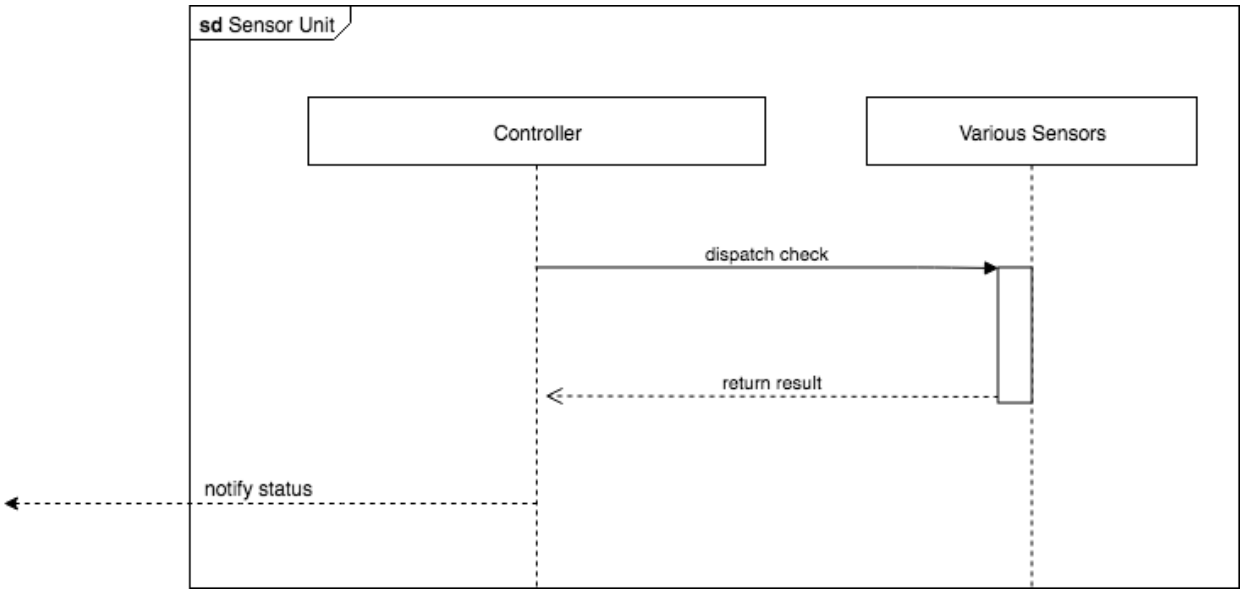

sd A-scenario
Truck
Customer
Central database
Mobile-gateway
Container
Deliver goods
alt
[checks central database for spoilage]
check status
notify spoilage
[checks mobile-gateway for spoilage]
check status
notify spoilage
finds spoiled containers
return spoiled container
return spoiled container


sd B-scenario
Factory
Short-term storage
Sensor unit
loop : continuously
notify status
alt
[status : bad]
request replacement
send replacement


sd C-scenario
Truck
Truck driver
Mobile-gateway
Sensor unit
return status
notify status
alt
[status : bad]
Apply counter measures

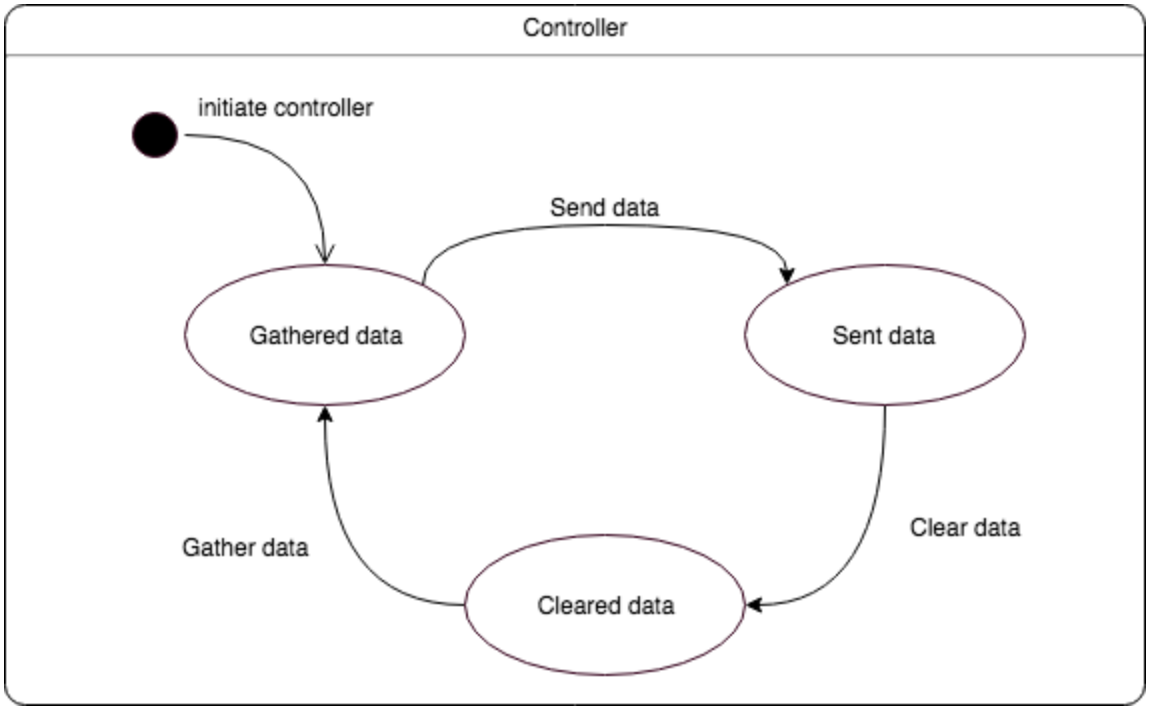


Question III



Question IV

a)



b) We believe the state-machine for the controller is consistent with respect to the controllers lifeline in the sequence diagram. Our controller continuously dispatches a check to the various sensors and relays the results to the respected actors. One assumption we have chosen to capitalize on is that the sensors can all be put under a various sensors part, as there would not be a difference in the interaction of the sensors. So our solution might seem a bit light, but is well thought out.

Question V

The state-machine we have opted for is robust in manner of how simple it is, which correlates to less points of failure. One thing we have not taken into consideration is the possibility of the sensor having technical difficulties. In such a case, the state machine should go to a separate state which indicates this. We did not implement or handle this scenario because this situation can occur in any part of the whole system. The way to handle this would be that the component which is faulty gives a message to the system above which sends a request for a replacement if needed.