AUTOMOBILE PRUDENT SYSTEM

SEQUENCE MODELLING

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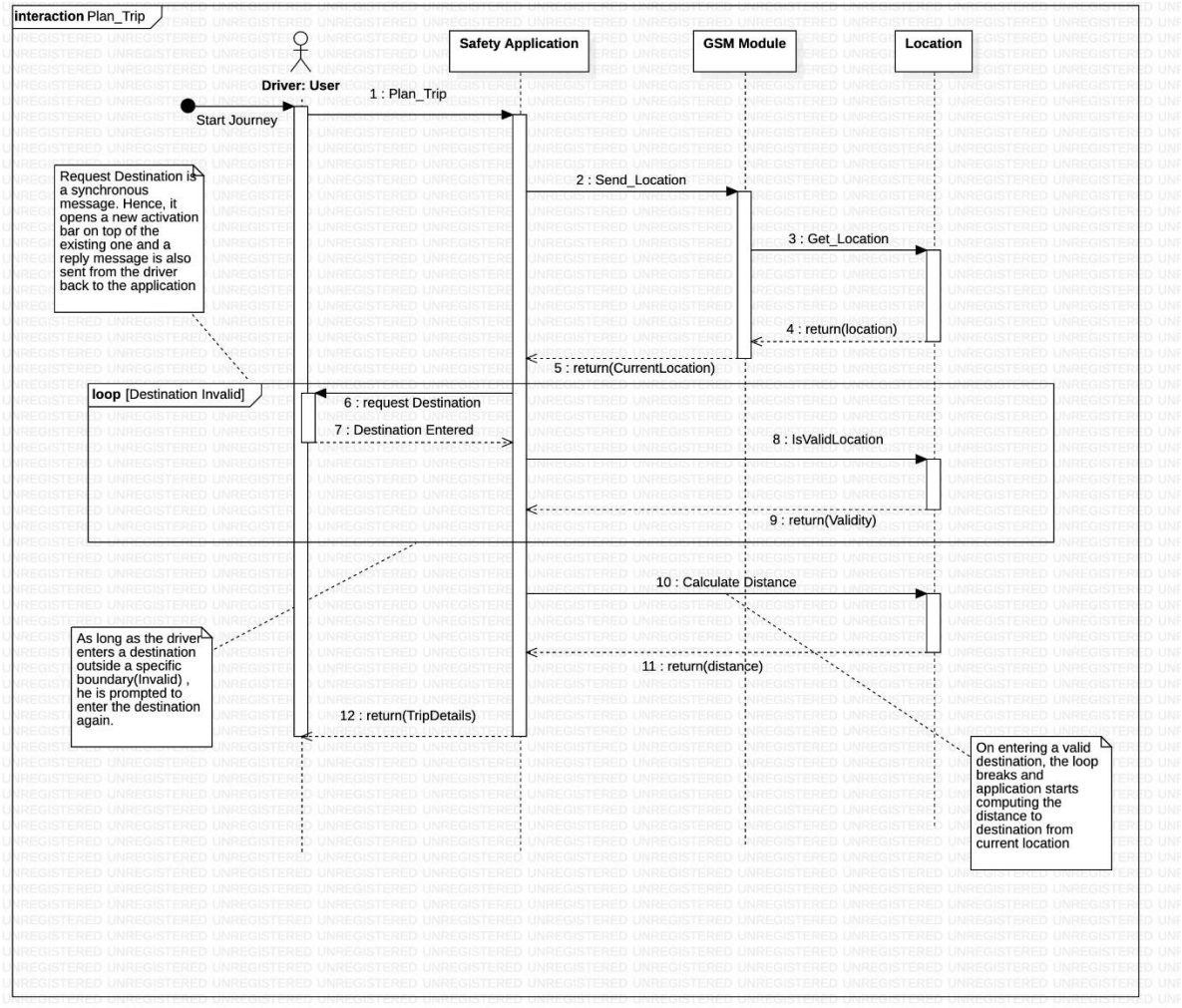
SD1 **Associated Usecase** – Plan_Trip

Collaborating classes - User, Safety Application, GSM Module, Location

Steps: User invokes the Plan_Trip method of safety application class

- Application finds the current location of the vehicle by invoking the send location method of GSM Module class.
- GSM Module in-turn retrieves the location by contacting the location class.
- Current Location is returned back to the safety application class
- User is prompted to enter the required destination location
- On entering a valid location, safety application class calculates the distance and returns the trip details to the user.

If the entered destination location is invalid, user is prompted to enter a valid destination until he gets one right.



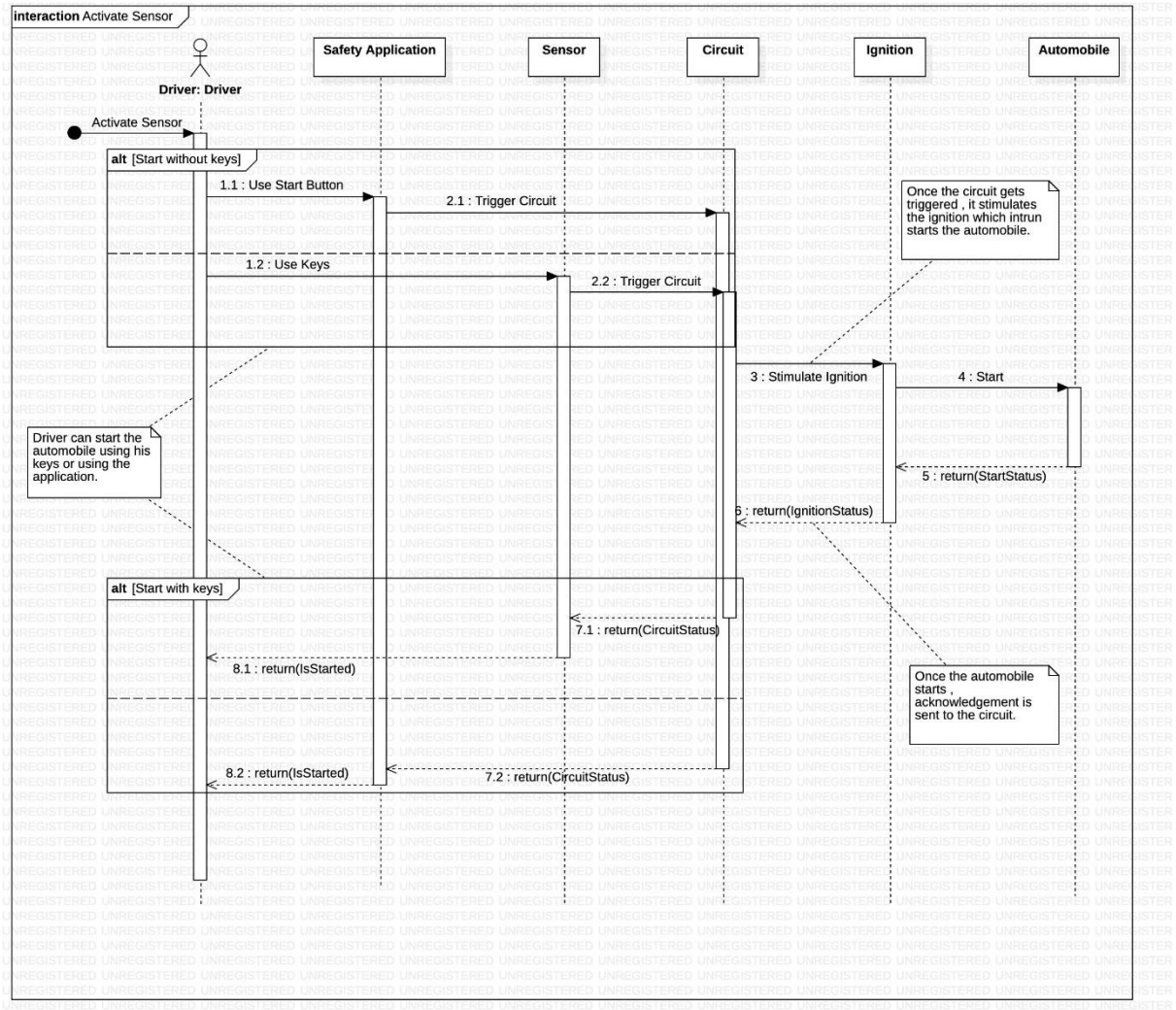
SD2

Associated Usecase – Activate Sensor

Collaborating classes - Driver, Safety Application, Sensor, Circuit, Ignition, Automobile

Steps:

- Driver has two options to start his automobile, i.e. With keys / Using the application.
- If he uses the application to start it directly triggers the circuit
- If he uses his keys to start it activates the sensor which in-turn triggers the circuit
- This is determined by the use of an alt frame.
- Once the circuit gets triggered, it stimulates ignition which in-turn starts the automobile.
- Since each message is synchronous, we're obliged to return a reply message.
- If the driver had started with application, he gets the return status from the safety application class, which in-turn got an acknowledge from the circuit class.
- If the driver had started using his keys, he gets the return status from the sensor class, which in-turn got an acknowledge from the circuit class.
- This is determined by the use of an alt frame.



SD3

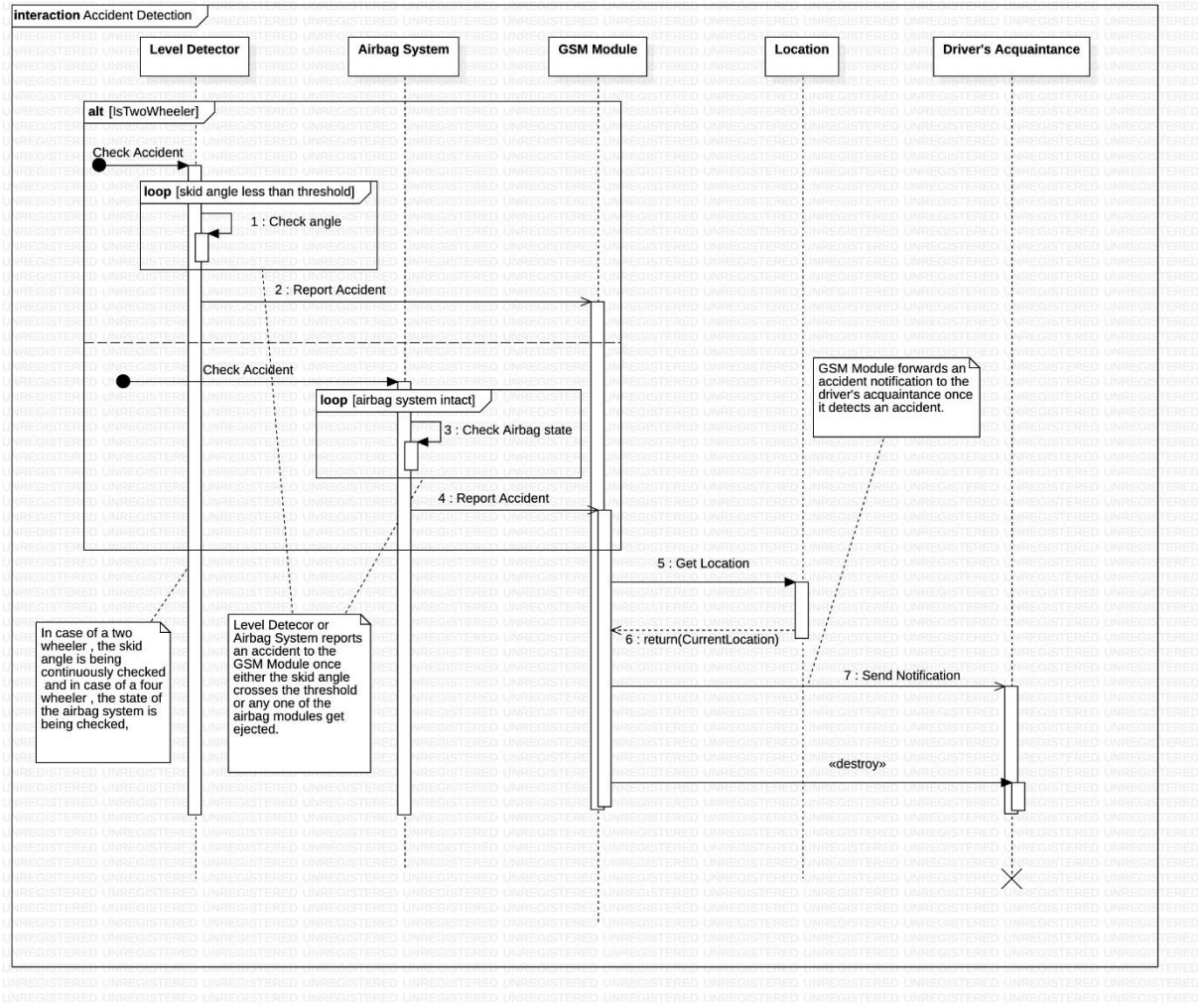
Associated Usecase – Encounter Accident, Detect Location

Collaborating classes - Level Detector, Airbag System, GSM Module, Location, Driver's Acquaintance

Steps:

- If the driver uses a two wheeler, the skid angle is continuously checked.
- If it crosses the threshold, the loop breaks (loop frame) and the level detector class reports an accident to the GSM Module class.
- If the driver uses a four wheeler, the state of his airbag system is continuously checked.
- If the airbag gets ejected at any point, the loop breaks (loop frame) and the airbag system class reports an accident to the GSM Module class.
- This is determined using an alt frame.
- GSM Module contacts the location class to retrieve the current location of the driver.
- It then sends a notification to the Driver's Acquaintance class, that contains the location.

Finally, the GSM Module destroys the already created object of Driver's Acquaintance class.



SD4

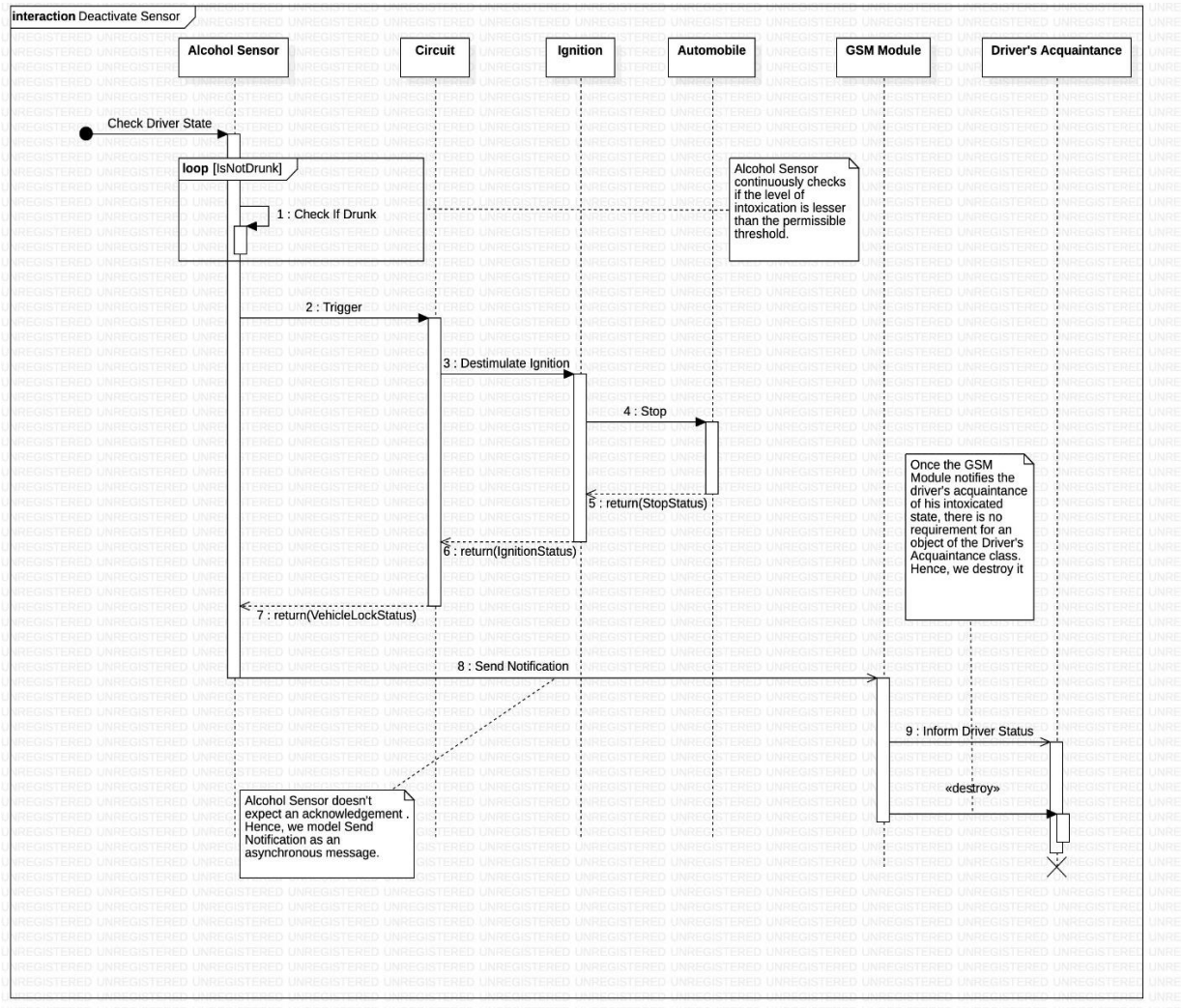
Associated Usecase – Deactivate Sensor, Enable alcohol sensor

Collaborating classes – Alcohol sensor,Circuit, Ignition, Automobile, GSM Module, Driver's Acquaintance

Steps:

- The level of intoxication of the driver is continuously checked.
- Loop breaks (loop frame) once the alcohol sensor detects that the driver is drunk.
- It triggers the circuit, which in-turn de-stimulates the ignition.
- As a result, the automobile comes to a halt.
- Since the messages sent till now are synchronous, corresponding reply messages are being returned.
- The alcohol sensor class sends a notification to the GSM Module class which in-turn informs the driver's acquaintance about his state.

Finally, the GSM Module destroys the already created object of Driver's Acquaintance class.



SD5

Associated Usecase – Book Service

Collaborating classes – Driver, Safety Application, Service Provider

Steps:

- Driver books service for his vehicle when its on due.
- The safety application class contacts the service provider class to confirm the required service date.
- Driver receives an acknowledgement from the application class, if the service provider returns an acceptance to the safety application class.
- While the status of the service is incomplete (loop frame), the service provider can update the status of the automobile and the driver can check this status parallelly (par frame).
- Once the service is complete, service provider generates the bill to the safety application class, which in-turn notifies the driver class.
- Finally driver makes his payment and a confirmation is sent to the service provider class.
- If the payment transaction is unsuccessful, the driver can attempt to make another transaction until he gets it successful.