Process Control - Group H

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1 Videos

Videos where too big for Moodle so we uploaded on : `https://drive.proton.me/urls/BX7X0QXYHM#ly41V7fR13DU`

2 Mandatory Exercises starting sequence

Expected behavior: The car is driving with blinking lights, changing speeds and changing lanes. By pressing Enter in the EmergencyService console, the car stop with Blinking lights on. By pressing Enter in the EmergencyService consol again, the car restart. If you look in the console of the TrackTheTracks, the trackId and the direction of the track (straight, left, right) are printed. This service works with one or multiple cars, but the TrackTheTracks service becomes quickly unreadable with multiple cars on so we limited it to one car.
Initial setup: Enter the VehicleId of the vehicles you want to use in the `activeVehicles` list of the UltimateRelay. Enter VehicleId of the specific vehicles you want to track in TrackTheTracks.

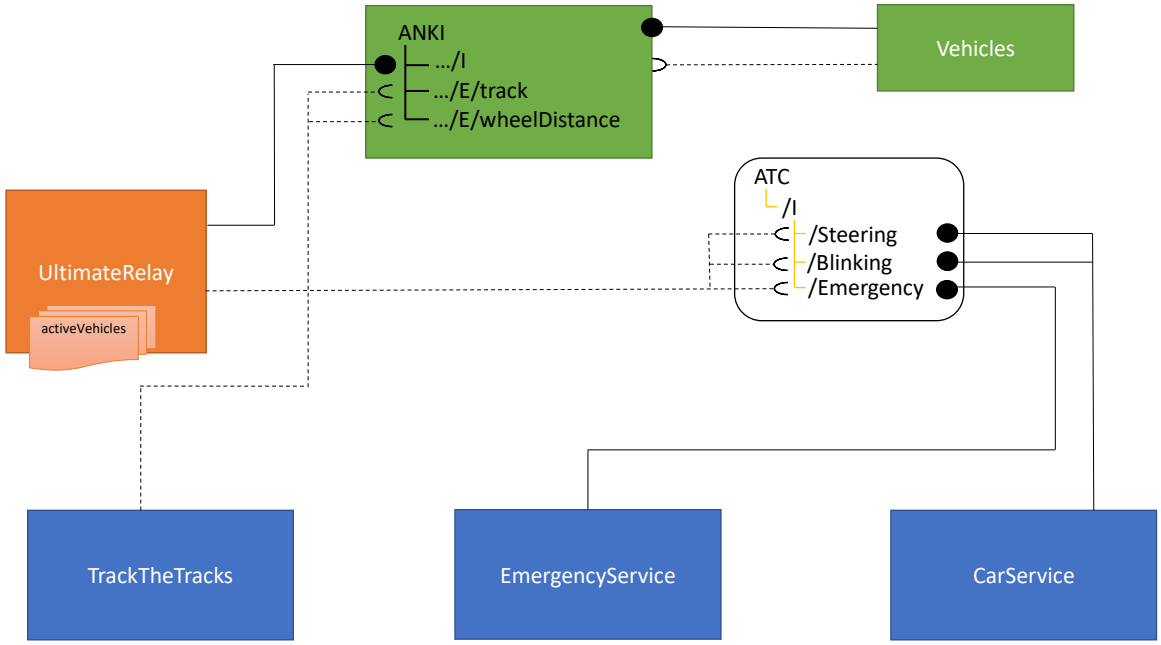

Figure 1: Mandatory Exercises - Process design

1. Start CarServiceMain
    - Implement CarService
    - Publish instructions about `BlinkingLights` in *ATC/I/Blinking*
    - Publish instructions about `ChangingSpeed` in *ATC/I/Steering*
    - Publish instructions about `ChangingLanes` in *ATC/I/Steering*
2. Start EmergencyService
    - Publish "DRIVE SAFE!" messages in *ATC/I/Emergency* when isEmergency = false
    - Publish "EMERGENCY STOP!" messages in *ATC/I/Emergency* when isEmergency = true

- Toggle isEmergency state by pressing *Enter*

3. Start TrackTheTracks
   - Subscribe to *Anki/Vehicles/U/+/E/track*
   - Subscribe to *Anki/Vehicles/U/+/E/wheelDistance*
   - Display `trackId` and turning direction in console
4. Start UltimateRelay
   - Connect to the vehicles
   - Subscribe to *ATC/I/Steering*
   - Subscribe to *ATC/I/Blinking*
   - Subscribe to *ATC/I/Emergency*
   - Publish instructions to the cars

3 Traffic Lights Project starting sequence

Expected behavior: Multiples car can run at the same time. If a car is at the traffic light (trackId = 23) and the light is red, the car stop. The other cars are driving normally. By pressing Enter in EmergencyService console, all the cars stop/restart.

Initial setup: Enter the VehicleId of the vehicles you want to use in the `activeVehicles` list of the UltimateRelay and TrafficLightService.

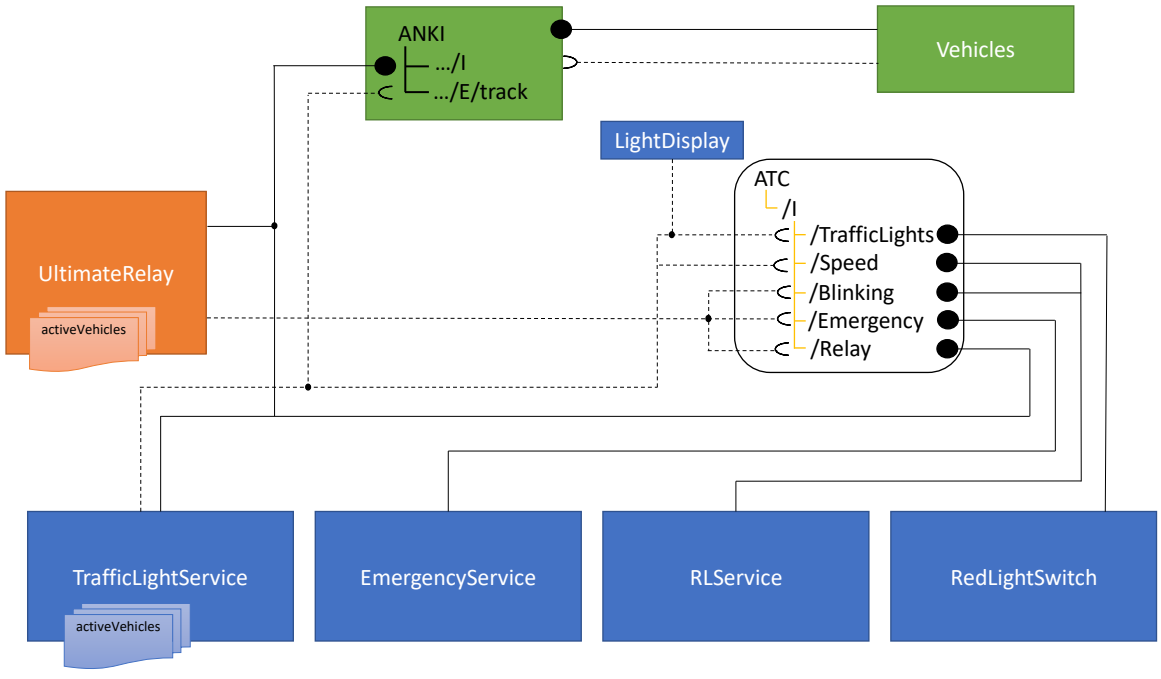

Figure 2: Traffic lights project - Process design

1. Start RedLightSwitch
   - Publish "REDLight" messages in *ATC/I/TrafficLights*
   - Publish "GREENLight" messages in *ATC/I/TrafficLights*
   - Alternate every 5 seconds

2. Start LightDisplay
    - Subscribe to *ATC/I/TrafficLights*
    - Display Traffic light color based on RedLightSwitch messages
3. Start RLServiceMain
    - Implement RLService
    - Publish instructions about `BlinkingLights` in *ATC/I/Blinking*
    - Publish instructions about `ConstantSpeed` in *ATC/I/Speed*
4. Start EmergencyService
    - Publish "DRIVE SAFE!" messages in *ATC/I/Emergency* when isEmergency = false
    - Publish "EMERGENCY STOP!" messages in *ATC/I/Emergency* when isEmergency = true
    - Toggle isEmergency state by pressing *Enter*
5. Start TrafficLightService
    - Connect to the vehicles
    - Subscribe to *Anki/Vehicles/U/+/E/track*
    - Subscribe to *ATC/I/TrafficLights*
    - Subscribe to *ATC/I/Speed*
    - Publish stop messages to the vehicle if it is on the track of the traffic light **AND** the traffic light is Red
    - Publish to *ATC/I/Relay* otherwise
6. Start UltimateRelay
    - Connect to the vehicles
    - Subscribe to *ATC/I/Steering*
    - Subscribe to *ATC/I/Blinking*
    - Subscribe to *ATC/I/Emergency*
    - Subscribe to *ATC/I/Relay*
    - Publish instructions to the cars