INSTRUCTIONS:

Fill out the hazard analysis and risk assessment below.
HA-001 should be for the lane departure warning function as discussed in the lecture.
HA-002 should be for the lane keeping assistance function as discussed in the lecture.
Then come up with your own situations and hazards for the lane assistance system. Fill in the HA-003 and HA-004 rows.
When finished, export your spreadsheet as a pdf file so that a reviewer can easily see your work.

Hazard ID			
	Operational Mode	**Operational Scenario**	**Environmental Details**
HA-001	OM03 - Normal driving	OS04 - Highway	EN06 - Rain (slippery road)
HA-002	OM03 - Normal driving	OS03 - Country Road	EN01 - Normal conditions
HA-003	OM03 - Normal driving	OS05 - Mountain Pass	EN03 - Fog (degraded view)
HA-004	OM03 - Normal driving	OS05 - Mountain Pass	EN08 - Glace (slippery road)

Situational Analysis

Situation Details	Other Details (optional)	Item Usage (function)	Situation Description
SD02 - High speed		IU01 - Correctly used	Normal Driving on Highway during Rain(slippery road) at high speed with correctly used system
SD02 - High speed		IU02 - Incorrectly used	Normal Driving on Country Road during Normal condition at high speed with incorrectly used system
SD02 - High speed		IU01 - Correctly used	Normal Driving on Mountain Pass during Fog (degraded view) with High speed
SD02 - High speed		IU01 - Correctly used	Normal Driving on Mountain Pass during Glace (slippery road) with High speed

Function	Deviation
Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback	DV04 - Actor effect is too much
Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV03 - Function always activated
Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback	DV19 - Sensor detection is wrong
Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback	DV04 - Actor effect is too much

The Driver used t

Hazard Identification

Deviation Details	Hazardous Event (resulting effect)
The LDW function applies an oscillating torque with very high torque (above limit).	EV00 - Collision with other vehicle
Lane Keeping Function is always activated	EV00 - Collision with other vehicle
Camera is not able to detect lane lines due to fog	EV02 - Collision with pedestrian
The LDW function applies an oscillating torque with very high torque (above limit).	EV03 - Car spins out of control

:he function to mimic autonomous car, thus lost focus from driving.

Event Details	Hazardous Event Description
High haptic feedback can affect driver's ability to steer as intended. The driver could lose control of the vehicle and collide with another vehicle.	The LDW function applies too high an oscillating torque to the steering wheel (above limit).
The Driver used the function to mimic autonomous car, thus lost focus from driving.	Lane keeping function is always on
The Lane Departure warning system doesn't work as intended due to camera ECU not able to detect lane lines.	The LDW function didn't work as intended, i.e. it didn't warn the driver when he is steering off the lane.
High haptic feedback can affect driver's ability to steer as intended. The driver could lose control of the vehicle and car could spin out of control	The LDW function applies too high an oscillating torque to the steering wheel (above limit).

H		
Exposure (of situation)	**Rationale (for exposure)**	**Severity (of potential harm)**
E3 - Medium probability	Driving on highway during rain can happen once a month	S3 - Life-threatening or fatal injuries
E2 - Low probability	This can happen few times to a driver	S3 - Life-threatening or fatal injuries
E2 - Low probability	Fog Days happen a few times a year .	S3 - Life-threatening or fatal injuries
E2 - Low probability	Glace happens few times a year	S3 - Life-threatening or fatal injuries

lazardous Event Classification

Rationale (for severity)	Controllability (of hazardous event)
collision at high spped can cause life threating injuries	C3 - Difficult to control or uncontrollable
collision at high spped can cause life threating injuries	C3 - Difficult to control or uncontrollable
collision at high spped can cause life threating injuries	C3 - Difficult to control or uncontrollable
collision at high spped can cause life threating injuries	C3 - Difficult to control or uncontrollable

	Det
Rationale (for controllability)	**ASIL Determination**
Its difficult to control car with excessive vibratons at high speed	C
Lane assistance system is always on , driver may asume car is in autonomous mode and may not be able to control when required	B
The Driver believes that the system is working as intended and thus takes less precautions while driving	B
Its difficult to control car with excessive vibratons at high speed and slippery road	B

ermination of ASIL and Safety Goals

Safety Goal
Oscillating tourque should be limited
Lane assistance system should be time limited
The Lane Departure Warning System shall warn the driver when one of its sensor isn't giving proper values.
Oscillating tourque should be limited