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 t
When finished, export your spreadsheet as a pdf file so that a reviewer can easily see your

Hazard ID				
	Operational Mode	**Operational Scenario**	**Environmental Details**	**Situation Details**
HA-001	OM03 - Normal driving	OS04 - Highway	EN06 - Rain (slippery road)	SD02 - High speed
HA-002	OM03 - Normal driving	OS03 - Country Road	EN01 - Normal conditions	SD02 - High speed
HA-003	OM03 - Normal driving	OS03 - Country Road	EN04 - Snowfall (degraded view)	SD02 - High speed
HA-004	OM03 - Normal driving	OS09 - Road tunnel	EN09 - N/A	SD02 - High speed

:he HA-003 and HA-004 rows.
work.

Situational Analysis	
Other Details (optional)	**Item Usage (function)**
	IU01 - Correctly used
	IU02 - Incorrectly used
	IU01 - Correctly used
	IU01 - Correctly used

Situation Description
Normal driving on a rainy day on a Highway.
Normal driving on country roads during normal conditions with high speed (the driver is misusing the lane keeping assistance function as a fully autonomous function)
Normal driving while snowfall with high speed on a country road
Normal driving in a tunnel without lane borders.

Haz		
Function	**Deviation**	**Deviation Details**
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 vibration of the steering wheel in order to warn the driver is too strong.
Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV03 - Function always activated	Driver could take off both hands from steering wheel and misuses the lane keeping function for autonomous driving
Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback	DV13 - Sensor sensitivity is too low	Due to limited view and snow on the streets, the sensor doesn't identify the lane departure correct.
Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV01 - Function not activated	Due to tunnel (bad lights) and no border lines in the lane, the Lane Detection and therefore the Lane Keeping isn't working at all.

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Hazardous Event (resulting effect)	Event Details	Hazardous Event Description
EV03 - Car spins out of control	By strong vibration the driver loses control over the car and the car spins out of control.	To strong feedback from steering wheel
EV00 - Collision with other vehicle	Because hands aren't on the wheel at high speeds, a vehicle accident would not be controllable.	misuse of function for autonomous driving
EV04 - Car comes off the road	The lane departure isn't working properly, the driver doesn't recognize the car leaving the lane.	Not detected lane departure
EV-06 - Front collision with oncoming traffic	Lane keeping isn't working, car is driving into oncoming traffic.	No detection of lanes

Hazardous Event Classific			
Exposure (of situation)	**Rationale (for exposure)**	**Severity (of potential harm)**	**Rationale (for severity)**
E3 - Medium probability	Driving on a highway on a rainy day is a standard usecase.	S3 - Life-threatening or fatal injuries	High speed on a highway (in general many other vehicles in closer surrounding)
E2 - Low probability	The combination of driving on a country road with high speed in combination of misusing the keep lane function is very unprobably.	S3 - Life-threatening or fatal injuries	High speed on a country road, an accident will in most cases cause fatal injuries.
E2 - Low probability	Driving with high speed during snow fall is not an every days situation.	S3 - Life-threatening or fatal injuries	High speed on a country road.
E1 - Very low probability	There aren't that much tunnels without any lane marks	S3 - Life-threatening or fatal injuries	High speed on a country road.

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Controllability (of hazardous event)	**Rationale (for controllability)**	**ASIL Determination**
C3 - Difficult to control or uncontrollable	Hands are on the wheel. Rain already causes higher attention, but the road is slippery.	C
C3 - Difficult to control or uncontrollable	Because hands aren't on the wheel at high speeds, a vehicle accident would not be controllable.	B
C2 - Normally controllable	The driver is in general aware that he's leaving the lane and should in principle react in an appropriate way (smooth steering)	A
C2 - Normally controllable	The driver is in general aware that he's leaving the lane and should in principle react in an appropriate way (smooth steering)	QM

termination of ASIL and Safety Goals
Safety Goal
The lane departure warning feedback - here the vibration of the steering wheel - must be limited to a acceptable value.
The lane keeping assisteance funciton shall be time limited and the additional steering torque shall end after a given time interval so that the driver cannot misuse the system for autonomous driving.
If possible, the sensor sensity must be adjusted according to weather conditions OR the lane assistence item must indicate possible misfunction due to weather conditions to the driver
Quality managed