INSTRUCTIONS:
Fill out the hazard analysis and risk assessment below.
HA-001 should be for the lane departure warning function as discussed in t
HA-002 should be for the lane keeping assistance function as discussed in
Then come up with your own situations and hazards for the lane assistanc
When finished, export your spreadsheet as a pdf file so that a reviewer can

Hazard ID			
	Operational Mode	**Operational Scenario**	**Environmental Details**
HA-001	OM08 - Normal driving	OS04 - Highway	EN06 - Rain (slippery road)
HA-002	OM08 - Normal driving	OS03 - Country Road	EN01 - Normal conditions
HA-003	OM08 - Normal driving	OS04 - Highway	EN06 - Rain (slippery road)
HA-004	OM08 - Normal driving	OS04 - Highway	EN01 - Normal conditions

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e system. Fill in the HA-003 and HA-004 rows.
easily see your work.

Situational Analysis

Situation Details	Other Details (optional)	Item Usage (function)	Situation Description
SD02 - High speed	Obstacle On + Bad Light	IU01 - Correctly used	Normal driving on a highway during rain (slippery road) at high speed and correctly used system.
SD02 - High speed	Oncoming Traffic + Smaller radius of road curvature	IU02 - Incorrectly used	Normal driving on a country road during normal conditions at high speed and incorrectly used system
SD02 - High speed	Obstacle On	IU01 - Correctly used	Normal driving on a highway on rain (slippery road) at high speed and correctly used system
SD02 - High speed	Obstacle On	IU01 - Correctly used	Normal driving on a highway during normal conditions at high speed and correctly used system.

		Hazard Identification	
Function	**Deviation**	**Deviation Details**	**Hazardous Event (resulting effect)**
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 oscillating steering torque provided to give the driver a haptic feedback is too high (above limit)	EV00 - Collision with other vehicle
Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV03 - Function always activated	The driver is keeping his hands off the steering wheel considering the system as fully autonomous system.	EV00 - Collision with other vehicle
Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV04 - Actor effect is too much	The steering torque applied by the lane keeping assistant funciton (LKA) is too high.	EV03 - Car spins out of control
Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback	DV07 - Actor action too late	The oscillating steering torque provided to give the driver a haptic feedback is too late.	EV-03 - Rear collision with trailing traffic

Event Details	Hazardous Event Description	Exposure (of situation)
High haptic feedback could affect the drivers ability to steer. The driver could lose the control of the car and it could collide with the other vehicles or road infrastructure.	The LDW function provides a high oscillating torque to the steering wheel (above limit).	E3 - Medium probability
The additional torque provided by the lane keeping assistance function could not be sufficient to keep the car in the lane. The car could collide with the other vehicles on the road.	The driver takes his hands off the steering wheel considering LKA funciton to be fully autonomous. The LKA is meant only to assist the driver.	E2 - Low probability
The torque provided by the lane keeping assistance funciton (LKA) is too high. The vehicle can oversteer and the driver can lose control	The steering torque provided by the LKA is too high causing the vehicle to become uncontrollable.	E3 - Medium probability
The haptic vibration feedback provided by the LDW function is too late and the vehicle could collide with the trailing car from the other lane.	The haptic feedback provided by the LDW is too late. The driver has little time to react to bring the vehicle back to the lane	E4 - High probability

Hazardous Event Classification		
Rationale (for exposure)	**Severity (of potential harm)**	**Rationale (for severity)**
Driving on highway on rain does not happen every day but it happens quite often	S3 - Life-threatening or fatal injuries	The vehicle is travelling at high speeds and so an accident could cause life threatening injuries
Driving on a country road and misusing the system does happens rarely and the situation has low probability	S3 - Life-threatening or fatal injuries	The vehicle is travelling at high speeds and so an accident could cause life threatening injuries
Driving on highway on rain does not happen every day but it happens quite often	S3 - Life-threatening or fatal injuries	The vehicle is travelling at high speeds and so an accident could cause life threatening injuries
Driving on a highway during normal road conditions has high probability	S3 - Life-threatening or fatal injuries	The vehicle is travelling at high speeds and so an accident could cause life threatening injuries

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Controllability (of hazardous event)	**Rationale (for controllability)**	**ASIL Determination**
C3 - Difficult to control or uncontrollable	An high oscillating steering torque affects the drivers ability to steer the vehicle. The situation is difficult to control	C
C3 - Difficult to control or uncontrollable	The driver's hands are off the steering wheel at high speeds. In this situation it would be difficult for the driver to control the vehicle in order to prevent the accident.	B
C3 - Difficult to control or uncontrollable	The high steering tourque provided by LKA causes the vehicle to oversteer. Oversteering is difficult for the driver to control the vehicle	C
C2 - Normally controllable	The haptic feedback provided by LDW is too late. The driver has little time to react to the situation. So it is harder to control	C

nination of ASIL and Safety Goals
Safety Goal
The osscilating torque provided by the lane departure warning (LDW) function shall be limited.
The lane keeping assistance function (LKA) shall provide additional steering torque for a limited time interval so that the driver cannot misuse the system for autonomous driving.
The lane keeping assistance function (LKA) shall not apply a high steering torque. The steering torque shall be limited.
The ossilating torque from the lane departure warning (LDW) function shall be provided within limited time when the vehicle leaves the lane.