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

Hazard ID	Situational Analysis		
	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	OS04 - Highway	EN01 -Fog(Degraded View)
HA-004	OM03 - Normal Driving	OS03 - Country Road	EN01 - lateral forces (Cross winds)

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

Situation Details	Other Details (optional)	Item Usage (function)	Situation Description
SD02 - High speed		IU01 - Correctly used	Normal driving on a highway during rain (slippery road) with high speed and correctly used system.
SD02 - High speed		IU01 - Incorrectly used	Driver misuses the LKA function by considering it to be fully autonomous
SD02 - High speed		IU01 - Correctly used	Normal driving on highway during fog with high speed and correctly used system
SD02 - High speed		IU01 - Correctly used	Normal driving on highway in strong winds with 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 - Steering wheel vibration is too much	The Lane Departure Warning function applies an oscillating torgue with very high torque (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 - LKA Function always activated	Lane keep assistance is always activated	EV00 - Collision with other vehicle.
Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV02 - Function unexpectedly activated	Camera sensor fails to get the correct location of the lane due to reduces visibility and system may unexpectedly get activated	EV04 - Car comes off the road
Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	Actor effect is too less	If the direction of the crosswind is opposite to the direction of the torque applied then the torque will be too less to keep the vehicle on lane	EV00 - Collision with other vehicle.

		Hazardous Event
Event Details	**Hazardous Event Description**	**Exposure (of situation)**
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 or with road infrastructure.	The Lane Departure Warning function applies an oscillating torgue with very high torque (above limit.)	E3 - Medium probability
Driver misintepret the LKA function and fails to handle critical situation	driver looses it focus on driving the car as LKA is always activated	E2 - Low probability
Due to incorrect lane detection the car may drive of road because the LDW system may start unexpectedly	Due to reduced visibility the LDW function may activate unexpectedly on the driver may think he is getting off lane and though the vehicle is moving in the correct lane , this may result in moving off the lane	E3 - Medium probability
If torque is not sufficient then the vehicle may collide with other lane vehicles	Amount of torque and wind force may be equal	E3 - Medium probability

t Classification

Rationale (for exposure)	Severity (of potential harm)	Rationale (for severity)	Controllability (of hazardous event)
Driving on a highway with rain could happen between 1% and 10% of the time operating the vehicle.	S3 - Life-threatening or fatal injuries	Collitions at high speed could cause fatal injuries.	C3 - Difficult to control or uncontrollable
Driving on the country road and missusing the system	S3 - Life-threatening or fatal injuries	Collitions at high speed could cause fatal injuries.	C3 - Difficult to control or uncontrollable
Driving on highway during fog	S3 - Life-threatening or fatal injuries	Driving off the road can result in hitting static objects	C3 - Difficult to control or uncontrollable
Driving on highway during windy situation	S3 - Life-threatening or fatal injuries	Collitions at high speed could cause fatal injuries.	C2 - Normally controllable

	Determination of ASIL and Safety Goals	
Rationale (for controllability)	**ASIL Determination**	**Safety Goal**
It is difficult to stay calm and react properly when the steering well is moving too much.	C	The oscillating steering torque from the Lane Departure Warning function shall be limited.
Since the LKA is always on the drivers removes it hand from the steering wheel completely and therefore it is hard to take back the control	B	LKA should be time limited so that the driver may not misuse the system
Due to driving at high speed the driver will find hard to react when the car gets close to the edge of the road	C	LKA should be deactivated and warning light should be displayed if lane is not getting detected
Quick appropriate evaluation and reaction can be done by the driver to steer back to the right lane	B	LKA should apply high torque if the winds are in the opposite direction of the torque