INSTRUCTIONS:
Fill out the hazard analysis and risk assessment below.
HA-001 should be for the lane departure warning function as discussed in
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 car

Hazard ID			
	Operational Mode	**Operational Scenario**	**Environmental Details**
HA-001	Normal driving	Highway	Rain (slippery road)
HA-002	Normal driving	Country Road	Normal conditions
HA-003	Normal driving	Mountain Pass	Sun blares (degraded view)
HA-004	Towing another car	Road with construction site	Normal conditions

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

Situational Analysis		
Situation Details	**Other Details (optional)**	**Item Usage (function)**
High speed		Correctly used
High speed		Incorrectly used
High speed		Correctly used
Low speed		Correctly used

Situation Description	Function	Deviation
Normal driving on a highway during ran (slippery road) with high speed and correcly used system	Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback	Actor effect is too much
Normal driving on country roads during normal conditions with high speed (the driver is misusing the lane keeping assistance function as an autonomous function)	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	Function always activated
Normal driving on country roads during sun blares (degraded view) with high speed and correctly used system	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	Lane detection does not work properly
Towing another car on road with construction site	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	Lane leaving necessary

Hazard Identification		
Deviation Details	**Hazardous Event (resulting effect)**	**Event Details**
The LDW function applies an oscillating torque with very high torque (above the limit)	Collision with other vehicle	High haptic feedback can effect 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 LKA function is always activated.	Collision with other vehicle	With the driver taking both hands off the wheel, the LKA function is always activated. This could result in acollision with an other vehicle or road infrastructure
The lane cannot be detected, thus system has no correct information of vehicle is in lane or not	Collision with other vehicle	The system state is in jeopardy.
Lane needs to be left in order to avoid construction site	Front collision with obstacle	LKA is activated but obstacle needs to be avoided.

Hazardous Event Description	Exposure (of situation)	Rationale (for exposure)
The LDW function applies too high an oscillating torque to the steering wheel (above limit)	Medium probability (E3)	The driver is on a highway during rain with correclty used system. That situation occurs quite regularely, but due to the high speed, the exposure is selected to E3 instead of E4.
The function is always activated, although it has not been designed to work in all situations all the time	Low probability (E2)	The driver is on a country road and misusing the system. That combination probably does not happen often.
The lane keeping system tries to keep the vehicle in the lane although the lane information is wrong, leading to a departure of the lane	Low probability (E2	The driver is on a mountain pass with high speed and degraded view due to sun blares. This situation does not happen often to normal drivers.
The lane keeping system tries to keep the vehicle in the lane although the driver is steering to avoid the obstacle	Low probability (E2	Because of constructions site, low probability of occurance is selected.

Hazardous Event Classification		
Severity (of potential harm)	**Rationale (for severity)**	**Controllability (of hazardous event)**
Life-threatening or fatal injuries (S3)	The driver is travelling at high speed, thus resulting in high potential harm in case of an accident.	Difficult to control or uncontrollable (C3)
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Life-threatening or fatal injuries (S3)	The driver is travelling at high speed, thus resulting in high potential harm in case of an accident.	Difficult to control or uncontrollable (C3)
Life-threatening or fatal injuries (S3)	The driver is travelling at medium speed, but a collision with a construction site could still cause life-threatening injuries.	Difficult to control or uncontrollable (C3)

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Rationale (for controllability)	**ASIL Determination**
Too much torque is applied to the steering wheel, which will make it uncontrollable	ASIL C
The driver's hands are off the wheel, so he would have no chance to react to a potential harmful situatoon in an appropriate time-frame	ASIL B
The lane keeping system is steering away from the road.	ASIL B
The lane keeping system is steering to stay on the road, although the driver tries to leave the road.	ASIL B

nation of ASIL and Safety Goals

Safety Goal
The osciallating steering torque from the lane departure warning function shall be limited.
The lane keeping assistance function 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.
The lane keeping assistance function shall be ended if a lane detection is not possible. If a steering torque is currently applied, information from a previous time frame shall be used.
The lane keeping assistance function shall be deactivated if a obstacle is detected in front.