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	Situational Analysis							Hazard Identification			
	Operational Mode	Operational Scenario	Environmental Details	Situation Details	Other Details (optional)	Item Usage (function)	Situation Description	Function	Deviation	Deviation Details	Hazardous Event (resulting effect)
HA-001	Normal Driving	Highway	Rain(slippery road)	High Speed		Correctly Used	Normal Driving on a highway during rain(slippery road) with high speed and correctly 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.	The LDW function applies an oscillating torque with very high torque (above limit).	Collision with other vehicle
HA-002	Normal Driving	Country Roads	Normal Conditions	High Speed		Incorrectly Used	Normal Driving on country roads during normal conditions with high speed and incorrectly used system.	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	Function is active.	The LKA function remains active all the time and keeps applying the torque to steer the vehicle to keep in the ego lane	Collision with other vehicle
HA-003	Normal Driving	City Road	Fog(Degraded view)	Low Speed		Correctly Used	Normal Driving on a highway during fog with low speed and correctly used system	Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback	Function unexpectedly activated	The camera sensor is not able to predict the lane properly and the function is actviated unexpectedly even when it is not required.	Side collision with other traffic
HA-004	Backward Driving	Road with gradient	Snow(slippery Road)	Low Speed		Correctly Used	Backwrad driving on a road with gradient during snowfall at low speed with a correctly used system	Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback	Function not activated	The back camera used for driving the car in reverse is not able to provide a clear view of the lane	Car comes off road

		Hazardous Event Classification						Determination of ASIL and Safety Goals	
Event Details	**Hazardous Event Description**	**Exposure (of situation)**	**Rationale (for exposure)**	**Severity (of potential harm)**	**Rationale (for severity)**	**Controllability (of hazardous event)**	**Rationale (for controllability)**	**ASIL Determination**	**Safety Goal**
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 LDW function applies too high an oscillating torque to the steering wheel (above limit).	E3-Medium Probability	Driving on a higway with the rains at high speed is not that common	S3- Life-threatening or fatal injuries	As the driver is driving at a high speed so the injuries can be life threatining	C3- Difficult to control; or uncontrollable	As the lane departure system is providing haptic feedback and is applying an oscillating torque to the steering it becomes difficult for a drive to control the vechicle.	ASIL C	The oscillating steering torque from the lane departure warning system shall be limited.
Being active all the time cause the vehicle to steer out of the lane and the diver could loose control on the vehicle	Thye LKA function is always active trying to steer the vechicle to the ego lane	E2 - Low Probability	As we are taking up tha case where the case where the driver is misusing the system so the case is unlikely.	S3- Life-threatening or fatal injuries	As the driver is driving at a high speed so the injuries can be life threatining	C3- Difficult to control; or uncontrollable	Because hands aren't on the wheel at high speeds, a vehicle accident would not be controllable	ASIL B	The lane keeping assistance function shall be time limited and additional steering torque shall end after a given time interval so that the driver cannot misuse the system for autonomous driving.
Vehicle collides to the oncoming traffic or the road infrastructure.	The camera sensor is not able to predict correctly if the vechicle is going off the road or not.	E2 - Low Probability	Driving on a city road with fog will only occour only few months in a year	S2- Light and moderate injuries	As the driver is driving at a low speed the there will be just minor injuries to the driver.	C3- Difficult to control; or uncontrollable	Even though the speed is low but if the Lane Departure system swithces on unexpectedly and acuses the steering to vibrate a lot it is difficult to control the vechicle.	ASIL A	The camera input should be cross checked with the other sensor inputs to check the acuuracy of it and the decissions should be made.
As the lane departure system is not activated so the car can drive off the raod while driving backwards or collide with the other vechicles coming from back	The camera sensor is not able to predict correctly if the vechicle is going off the road or not.	E2- Low Probability	Driving during snowfall is not that common as it snows only during somne months of the year.	S2- Light and moderate injuries	As the driver is driving at a low speed the there will be just minor injuries to the driver.	C3- Difficult to control; or uncontrollable	Even though the speed is low but if the Lane Departure system swithces on unexpectedly and acuses the steering to vibrate a lot it is difficult to control the vechicle.	ASIL A	The camera input should be cross checked with the other sensor inputs to check the acuuracy of it and the decissions should be made.