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 systems. 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						Hazardous Event Classification						Determination of ASIL and Safety Goals	
	Operational Mode	Operational Scenario	Environmental Details	Situation Details	Other Details (optional)	Item Usage Function)	Situation Description	Function	Deviation	Deviation Details	Hazardous Event (mualfoo effect)	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
HA-001	Normal Driving	Highway	Rain(slippery road)	High Speed		Correctly Used	Normal Driving on a highway during rain 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	high haptic feedback can affect driver's ability to steer as intented. The driver loose control and could collide with another vehicle or side of the road.	The LDW function applies too high an oscillating torque to the steering wheel (above limit).	E3 - medium	Driving on a highway with rain could happen between 1% and 10% of the time operating the vehicle. This may occur once a month	S3	Collisions at high speed is a life threatening situation and can cause fatal injuries	C3 - Difficult to control	It is difficult to control the car steering in rain if the steering wheel is vibrating	ASIL - C	The oscillating steering torque from the Lane Departure Warning function shall be limited.
HA-002	Normal Driving	Country Road	Normal conditions	High speed		Incorrectly used	Normal Driving on a country road in normal conditions at high speed and incorrectly used system	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order	Function is always active	The Lane Keeping assistance is always active	Collision with other vehicle	The driver is over-using the lane keeping assistance by considering it as a self-driving car feature. Thus the driver looses attention and the car collides with	The Driver doesnot use the Lane Keeping Assistant function correctly and leaves the steering wheel causing collision.	E2 - Low	Driving in country road happens only a few times a year. Its probability is <1% of average operating time	S3	Driving at high speed is a life threatening situation	C3 - Difficult to control	The driver is travelling at high speed in country roads. So, its difficult to control	ASIL - B	The Lane Keeping Assistance function shall be time limited, and additional steering torque shall end after a given time interval so the driver cannot misuse the system for autonomous driving.
HA-003	Normal Driving	Mountain Pass	Snowfall (degraded view)	Low Speed		Correctly Used	Normal Driving in a Mountain Pass in Snowfall at low-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).	Car slips and goes off road	The lane is covered with snow and the car cannot detect the undrive. Camera doesn't function properly and thus LDW system may activate	Lane departure system malfunctions even though the driver is driving carefully. This is because, due to snow the lanes might not be clearly visible. If vibrational torques are applied on the steering wheel in this case, then the car can skid or become	E2 - Low	Driving in mountains along with snowfall doesn't happen very often and thus has probability of <5% of average operating time	S3	Driving in mountains with snowfall is risky and life threatening if met with accident.	C3 - Difficult to control	Its difficult to control a car in snowfall and in the mountains	ASIL - B	In mountain regions, the Lane Departure Warning function shall be limited. If the driver should not be very high, it would be highly advisable to disable the system as visibility is not clear.
HA-004	Normal Driving	Highway	Cross Wind (lateral force)	High Speed		Correctly Used	Normal Driving on a highway in cross wind at high speed and correctly used system	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order	Actor effect is too less	The Lane Keeping assistance is not working properly because the torque is not sufficient to keep the car in lane.	Car drifts of the road or collides with other vehicles	Due to high lateral cross wind, the lane keeping assistance is not able to keep the car in the lane.	If the amount of torque applied by the LKA is not sufficient enough, then the car will move to the edge of lane and thus get in accident.	E2 - medium	Cross winds can occur once a month and thus have a probability between 1% to 10% of average operating time	S3	Driving in highways with high speed during wind can result in serious accidents	C2 - Normally Controllable	The driver can control the car and steer it in right lane	ASIL - B	The lane assisting system should apply a high torque in case of strong winds, so that the car can maintain its lane.