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							
	Operational Mode	Operational Scenario	Environmental Details	Situation Details	Other Details (optional)	Item Usage (function)	Situation Description	Function
HA-001	OM03 - Normal Driving	OS03 - Highway	EN06 - Rain (slippery road)	SD02 - High speed		IU01 - Correctly used	Normal Driving on 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
HA-002	OM03 - Normal Driving	OS02 - Country Road	EN01 - Normal conditions	SD02 - High speed		IU02 - Incorrectly used	Normal driving on country roads during normal conditions with high speed (the driver is misusing the lane keeping assistance function as a fully autonomous function)	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane
HA-003	OM03 - Normal Driving	OS01 - City Road	EN01 - Normal conditions	SD03 - Low speed		IU01 - Correctly used	Normal Driving on City Road during Normal conditions with Low speed	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane
HA-004	OM03 - Normal Driving	OS06 - Off Road	EN02 - Sun blares (degraded view)	SD03 - Low speed	Obstacle on the road	IU01 - Correctly used	Normal Driving on Off Road during Sun blares (degraded viewr) with Low speed (Obstacle on the road)	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane

Hazard Identification					Hazar		
Deviation	**Deviation Details**	**Hazardous Event (resulting effect)**	**Event Details**	**Hazardous Event Description**	**Exposure (of situation)**	**Rationale (for exposure)**	**Severity (of potential harm)**
DV04 - Actor effect is too much	The LDW function applies an oscillating torque with very high torque (above limit)	EV00 - Collision with other vehicle	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	When the driver got too high an ascillating torque, the driver will be likely to loose control of the vehicle.	S3 - Life-threatening or fatal injuries
DV03 - Function always activated	The LKA function is always activated.	EV00 - Collision with other vehicle	The LKA function without limit for for the time its turned on, got the driver to believe the function as if it were meant for fully autonomous driving.	The driver treat the LKA function as if it were meant for fully autonomous driving.	E2 - Low probability	At this point, full autonomous driiving is not common. So it is less likely that the driver think the LKA function as if fully autonoous driving.	S3 - Life-threatening or fatal injuries
DV02 - Function unexpectedly activated	The LKA function is unexpectedly activated even when the driver turn on the blinkers.	EV05 - Front collision with ahead traffic	Vehicle crashes into the vehicle with injury to driver	The driver fail to lane change as expected and crashes with ahead vehicle.	E2 - Low probability	Majority of drivers will be likety to avoid the accident by braking.	S2 - Severe and life-threatening injuries
DV18 - Sensor detection is reverse	The LKA function add the reverse torque when the vehicle changes the lane	EV02 - Side collision with other traffic	Vehicle crashes into the vehicle with injury to driver	The driver unintentionally change the lane too sharply and crashes with side vehicle.	E2 - Low probability	Majority of drivers will be likety to avoid the accident by braking.	S2 - Severe and life-threatening injuries

dous Event Classification			Determination of ASIL and Safety Goals	
Rationale (for severity)	**Controllability (of hazardous event)**	**Rationale (for controllability)**	**ASIL Determination**	**Safety Goal**
On highway speed of vehicle is expected to be high	C3 - Difficult to control or uncontrollable	When driving on highway, the level of control of vehicle is required higher level than low speed condition.	C	The oscillating steering torque from the lane departure warning function shall be limited.
On highway speed of vehicle is expected to be high	C3 - Difficult to control or uncontrollable	When driving on highway, the level of control of vehicle is required higher level than low speed condition.	B	The LKA function shall be limited and additional steerring torque shall end after a given time interval so that the driver cannot misuse the system for autonomous driving.
In city traffiic, speed of vehicle is expected to be low, but car accident may cause severe injuires	C2 - Normally controllable	At city speed, most drivers will be able to control the situation by applying brakes	QM	The LKA function shall not be activated when the driver turn on the blinkers
In Off Road traffiic, speed of vehicle is expected to be low, but car accident may cause severe injuires	C3 - Difficult to control or uncontrollable	At Off road speed, it is likely that the cotrollability of the vehicle is quite low and unintentional torque will get the situation worse	A	The LKA function shall not be activated when the vehicle on the off road (without lane)