

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						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 (resulting 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	OM03 - Normal driving	OS04 - Highway	EN06 - Rain (slippery road)	SD02 - High speed		IU01 - Correctly used	Normal driving on a highway with a wet slippery road at high speed and correctly used system.	Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback	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	The driver is driving on wet road in the highway, the probably is quite often.	S3 - Life-threatening or fatal injuries	the driver is traveling at high speed	C3 - Difficult to control or uncontrollable	If the lane departure warning function causes the steering wheel to vibrate excessively with swings of the steering wheel,most drivers would have difficulty controlling the vehicles.	C	The oscillation steering torque from the lane departure warning function shall be limited.
HA-002							OM03 - Normal Driving	OS03 - Country Road	EN01 - Normal conditions	SD02 - High speed		IU01 - Correctly used	Normal driving on country roads during normal conditions with high speed (the driver is missing the lane keeping assistance function as a fully autonomous function) and correctly used system.	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV03 - Function always activated	The LKA function add extra steering torque for a unlimited amount of time and continue providing extra torque.	EV00 - Collision with other vehicle	The driver treat the function as if were meant for fully autonomous driving, and then the driver could lose control of the vehicle and collide with another vehicle or with road infrastructure.	The LKA function applies too long time extra steering torque(longer than limit)	E2 - Low probability	The driver is on a country road and misusing the system. That combination probably does not happen often
HA-003	OM03 - Normal Driving	OS04 - Highway	EN01 - Normal conditions	SD02 - High speed		IU01 - Correctly used	Normal driving on a highway with good road at high speed and correctly used system.	Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback	DV07 - Actor action too late	The LDW function applies an oscillating torque with very long response time.	EV00 - Collision with other vehicle	The driver is sleepy when driving , and the car slowly drive to neighbor lane. He would loss control of the car if the warning response time is too long.	The LDW function response time is too long(longer than limit)	E4 - High probability	The driver is driving on dry road in the highway, the probably is always.	S3 - Life-threatening or fatal injuries	the driver is traveling at high speed	C3 - Difficult to control or uncontrollable	If the lane departure warning function causes the steering wheel to vibrate excessively with swings of the steering wheel,most drivers would have difficulty controlling the vehicles.	D	The response time of lane departure warning function shall be time limited.
HA-004							OM03 - Normal Driving	OS04 - Highway	EN01 - Normal conditions	SD02 - High speed		IU01 - Correctly used	Normal driving on a highway with good road at 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	DV04 - Actor effect is too much	The LKA function add very big steering torque.	EV00 - Collision with other vehicle	The speed of the car is very fast , then a big suddenly steering torque could trigger the car drifting on the road.	The LKA function applies too big extra steering.	E4 - High probability	The driver is driving on dry road in the highway, the probably is always.