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	V01 - Normal condition	SD02 - High speed		IU01 - Correctly used	Normal Driving on a Highway at High Speed with active Lane Departure Warning function	Lane Departure Warning (LDW) function shall apply an oscillating steering torque to provide the driver with haptic feedback	DV04 - Actor effect is too much	Oscillating steering torque exceeds limit	EV08 - Collision with other vehicle	Vehicle crashes into traffic or road infrastructure with injury to driver and any others present	Driver loses control of vehicle	E3 - Medium probability	Activation of the lane departure warning system during highway driving at high speed is a medium probability event.	S3 - Life-threatening or fatal injuries	On highway, speed of vehicle is expected to be high	C2 - Normally controllable	Since the steering wheel rotates uncontrollably, it will be difficult for the average driver to control the vehicle in such a situation	C	The oscillating steering torque from the LDW function shall be limited
HA-002	OM03 - Normal driving	OS04 - Highway	V01 - Normal condition	SD02 - High speed	Driver takes hands off the wheel and abuses Lane Keeping Assistance as Autopilot	IU02 - Incorrectly used	Normal Driving on a Highway at High Speed	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV03 - Function always activated	LKA is always active	EV08 - Collision with other vehicle	Vehicle crashes into traffic or road infrastructure with injury to driver and any others present	Driver loses control of vehicle	E2 - Low probability	Driver abusing the LKA as Autopilot during highway driving at high speeds is a low probability event	S3 - Life-threatening or fatal injuries	On highway, speed of vehicle is expected to be high	C3 - Difficult to control or uncontrollable	Since driver has his hands off the wheel, he cannot control the vehicle	B	The LKA function shall be time limited and the additional steering torque shall end after a given time interval
HA-003	OM03 - Normal driving	OS09 - Road tunnel	I03 - Fog (degraded vis	SD02 - High speed		IU01 - Correctly used	Normal Driving through a Road Tunnel at High Speed during Fog with active Lane Keeping Assistance function	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV10 - Actor effect is reverse	Steering torque applied, but in the wrong direction	EV02 - Front collision with oncoming traffic	Vehicle crashes into traffic or road infrastructure with injury to driver and any others present	Driver loses control of vehicle	E1 - Very low probability	Activation of the lane departure system while driving through a tunnel during fog at high speed is a very low probability event	S3 - Life-threatening or fatal injuries	Collision at high speed in highly constrained space	C3 - Difficult to control or uncontrollable	Since LKA generates an entirely unexpected steering input and with little time to react, a driver will typically not be able to control the vehicle	A	The LKA function shall be deactivated during foggy conditions
HA-004	OM03 - Normal driving	OS03 - Country Road	I06 - Rain (slippery roa	SD02 - High speed		IU01 - Correctly used	Normal Driving on a Country Road during Rain at High Speed	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV02 - Function unexpectedly activated	LKA corrects driver input while driver attempts to evade obstacle	EV11 - Car spins out of control	Vehicle crashes into traffic or road infrastructure with injury to driver and any others present	Driver loses control of vehicle	E2 - Low probability	Evading obstacle on a country road in the rain at high speed is a low probability event	S3 - Life-threatening or fatal injuries	Speed of vehicle is high while attempting to evade obstacle	C3 - Difficult to control or uncontrollable	Driver does not expect extra torque in steering wheel and loses control in already difficult to control situation	B	The LKA function shall be deactivated during heavy steering input by the driver