INSTRUCTIONS:
Fill out the hazard analysis and risk assessment bel
HA-001 should be for the lane departure warning f
HA-002 should be for the lane keeping assistance f
Then come up with your own situations and hazarc
When finished, export your spreadsheet as a pdf fil

Hazard ID		
	Operational Mode	Operational Scenario
HA-001	OM03 - Normal driving	OS04 - Highway
HA-002	OM03 - Normal driving	OS03 - Country Road
HA-003	OM03 - Normal driving	OS09 - Road tunnel

HA-004	OM03 - Normal driving	OS10 - Road with construction site

ment below.
warning function as discussed in the lecture.
sistance function as discussed in the lecture.
nd hazards for the lane assistance system. Fill in the HA-003 and HA-004 rows.
s a pdf file so that a reviewer can easily see your work.

Situational Analysis			
Environmental Details	Situation Details	Other Details (optional)	Item Usage (function)
EN06 - Rain (slippery road)	SD02 - High speed		IU01 - Correctly used
EN01 - Normal conditions	SD02 - High speed		IU02 - Incorrectly used
EN07 - Snow (slippery road)	SD02 - High speed	Night time	IU02 - Incorrectly used

EN03 - Fog (degraded view)	SD02 - High speed		IU02 - Incorrectly used

Situation Description	Function	Deviation
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	DV04 - Actor effect is too much
Normal driving on country roads during normal conditions with high speed (the driver is misusing the lane keeping assistance function as an autonomous function)	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV03 - Function always activated
Normal driving on road tunnel during snow with high speed (the driver is misusing the lane keeping assistance function as an autonomous function)	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV16 - Sensor detection before

Normal driving on road with construction site during fog with high speed (the driver is misusing the lane keeping assistance function as an autonomous function)	Lane Keeping Assistance (LKA) function shall apply the steering torque when active in order to stay in ego lane	DV01 - Function not activated

Hazard Identification		
Deviation Details	Hazardous Event (resulting effect)	Event Details
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 lane keeping assistance function is always activated	EV00 - Collision with other vehicle	The driver can take both hands off the wheel and incorrectly treat the car as a fully autonomous vehicle The driver could lose control of the vehicle and collide with another vehicle or with road infrastructure.
The LKA function applies an oscillating torque before it is needed	EV-06 - Front collision with oncoming traffic	Lane Keeping Assistance activate when not needed, resulting in vehicle movment into oncoming traffic

The LKA function does not apply an oscillating torque	EV-01 - Side collision with obstacle	Lane Keeping Assistance does not activate, and the car hits construction barrier

Hazardous Event Description	Exposure (of situation)	Rationale (for exposure)
Collision with other vehicle	E3 - Medium probability	The driver is on a highway in the rain and correctly using the system. That combination probably does happen often, so we will label the exposure E3
Collision with other vehicle	E2 - Low probability	The driver is on a country road and misusing the system. That combination probably does not happen often, so we will label the exposure E2
Frontal small overlap collision with oncoming traffic	E2 - Low probability	The driver is in a road tunnel and misusing the system. That combination probably does not happen often, so we will label the exposure E2

Vehicle side swipes concrete construction barrier, and bends the car frame	E3 - Medium probability	The driver is in a road with construction and misusing the system. That combination probably does happen often, so we will label the exposure E3

Hazardous Event Classification		
Severity (of potential harm)	Rationale (for severity)	Controllability (of hazardous event)
S3 - Life-threatening or fatal injuries	Because the driver is traveling at high speed, severity would be S3	C3 - Difficult to control or uncontrollable
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	Determination of ASIL and Safety Goals	
Rationale (for controllability)	ASIL Determination	Safety Goal
Because the steeing wheel is vibrating excessively most drivers would have difficulty controlling the vehicle. We will label this hazardous situation as C3	C	The oscillating steering torque from the lane departure warning function shall be limited
Because hands aren't on the wheel at high speeds, a vehicle accident would not be controllable. We will label this hazardous situation as C3	B	The lane keeping assistance function shall be time limited and the additional steering torque shall end after a given time interval so that the driver cannot misuse the system for autonomous driving.
Because hands aren't on the wheel at high speeds, a vehicle accident would not be controllable. We will label this hazardous situation as C3	B	The LKA function shall not be activated when not required

Because hands aren't on the wheel at high speeds, a vehicle accident would not be controllable. We will label this hazardous situation as C3	C	The LKA function shall activate when there are construction barriers