**Competency Questions for Assessing VSSo**

**Car Attributes**

**What are the attributes of this car and what do they express?**

SELECT ?attribute ?branch ?value

WHERE { ?attribute rdfs:subPropertyOf vsso:attribute.

?branch ?attribute ?value.}

**How many attributes does this car have?**

SELECT (count(distinct ?attribute) as ?nbAttribute)

WHERE{?attribute rdfs:subPropertyOf vsso:attribute.}

GROUP BY ?x

**What is the model of this car?**

SELECT ?model

WHERE { ?branch vsso:model ?model.}

**What is the brand of this car?**

SELECT ?brand

WHERE { ?branch vsso:brand ?brand.}

**What is the registration number of this car?**

SELECT ?vin

WHERE { ?branch vsso:registration number ?registration number.}

**How old is this car?**

SELECT ?age

WHERE { ?branch vsso:year ?year.

BIND((2018-?year) AS ?age)}

**What are the dimensions of this car?**

SELECT ?length ?width ?height

WHERE { ?branch vsso:length ?length;

vsso:width ?width;

vsso:height ?height.}

**What are the characteristics of this car's chassis?**

SELECT ?attribute ?value

WHERE { ?attribute rdfs:subPropertyOf vsso:attribute.

?chassis a vsso:Chassis;

?attribute ?value.}

**What type of fuel does this car need?**

SELECT ?fueltype

WHERE {?branch vsso:fuelType ?fuelType.}

**What type of transmission does this car have?**

SELECT ?type

WHERE { ?branch vsso:transmissionType ?type.}

**What are the characteristics of this engine?**

SELECT ?engine ?attribute ?value

WHERE { ?attribute rdfs:subPropertyOf vsso:attribute.

?engine a vsso:InternalCombustionEngine;

?attribute ?value.}

**How many doors does this car contain?**

SELECT ?nbDoor

WHERE { ?branch vsso:doorCount ?nbDoor.}

**How many seats do I have this my car?**

SELECT ?nbSeats ?nbRows

WHERE { ?seats a vsso:Seat;

vsso:rowCount ?nbRows;

vsso:row1PosCount ?row1Count;

vsso:row2PosCount ?row2Count;

vsso:row3PosCount ?row3Count;

vsso:row4PosCount ?row4Count;

vsso:row5PosCount ?row5Count.

BIND((?row1Count + ?row2Count + ?row3Count + ?row4Count + ?row5Count) AS ?nbSeats)}

**On which side is located the steering wheel?**

SELECT ?steeringWheelSide

WHERE { ?wheel a vsso:SteeringWheel;

vsso:steeringWheelSide ?steeringWheelSide.}

**Static Signals**

**Is there a signal measuring the steering wheel angle?**

SELECT ?signal

WHERE { ?signal a vsso:SteeringWheelAngle.}

**Which signals are controllable?**

SELECT ?signal ?actuator

WHERE { ?actuator vsso:consumes ?signal.

?signal a vsso:ActuatableSignal.}

**Which signals are both observable and actuatable?**

SELECT ?signal ?sensor ?actuator

WHERE { ?actuator vsso:consumes ?signal.

?sensor sosa:observes ?signal.

?signal a vsso:ActuatableSignal, vsso:ObservableSignal.}

**How many sensors does this car contain?**

SELECT (count(distinct ?sensor) as ?nbSensor)

WHERE { ?sensor sosa:observes ?signal.

?signal a vsso:ObservableSignal.}

**How many different speedometers does this car contain?**

SELECT (count(distinct ?sensor) as ?nbSpeedSensors)

WHERE { ?sensor a vsso:Speedometer.}

**Which signals measure a temperature, and in which part of this car?**

SELECT ?signal ?branch

WHERE { ?branch vsso:hasSignal ?signal.

?signal a vsso:AmbientAirTemperature.

}

**What are the characteristics of the sensor producing the signal “TravelledDistance” ?**

SELECT ?sensor ?p ?o

WHERE { ?sensor a ?sensor;

vsso:observes ?signal;

?p ?o.

?signal a vsso:TravelledDistance.}

**Dynamic signals**

**What is the current gear?**

SELECT ?signal ?result ?time

WHERE {?signal a vsso:CurrentGear.

?obs a sosa:Observation;

sosa:observedProperty ?signal;

sosa:hasSimpleResult ?result;

sosa:phenomenonTime ?time.

}

ORDER BY DESC(?time)

LIMIT 1

**What are the values of all signals representing the speed of this car now?**

SELECT ?signal ?result ?time

WHERE {?signal a vsso:VehicleSpeed.

?obs a sosa:Observation;

sosa:observedProperty ?signal;

sosa:hasSimpleResult ?result;

sosa:phenomenonTime ?time.

}

ORDER BY DESC(?time)

**Which windows are currently open?**

SELECT ?position ?value ?time

WHERE {?signal a vsso:WindowPosition.

?window vsso:hasSignal ?signal.

?obs a sosa:Observation;

sosa:observedProperty ?signal;

sosa:hasSimpleResult ?value;

sosa:phenomenonTime ?time.

?window vsso:position ?position.

}

ORDER BY DESC(?time)