1) **Query 1 (UNION):** Retrieve the full names of all people (customers and staff) involved in a sale on 4/7/2018.

$$\Pi_{\text{first\_name,last\_name}}(\sigma_{\text{date="20180407"}}(\text{CUSTOMER} \bowtie_{\text{cid=cid}} \text{SALE}))$$
$$\cup$$
$$\Pi_{\text{first\_name,last\_name}}(\sigma_{\text{date="20180407"}}(\text{STAFF} \bowtie_{\text{staff\_id=staff\_id}} \text{SALE}))$$

2) **Query 2 (INTERSECT):** Retrieve the VIN of all cars that have been in an accident AND have a warranty.

$$(\Pi_{\text{vin}}(\text{ACCIDENT\_REPORT})) \cap (\Pi_{\text{vin}}(\text{WARRANTY}))$$

3) **Query 3 (DIFFERENCE):** Retrieve the VIN of all cars that have a warranty but have not been in an accident

$$\Pi_{\text{vin}}(\text{WARRANTY}) - \Pi_{\text{vin}}(\text{ACCIDENT\_REPORT})$$

4) **Query 4 (DIVISION):** Retrieve the full name of customer(s) who have bought every car from David Zucco.

$$\text{DZCars} \leftarrow \Pi_{\text{vin}}(\sigma_{\text{fname="David" AND lname="Zucco"}}(\text{STAFF} \bowtie_{\text{staff\_id=staff\_id}} \text{SALE})$$
$$\Pi_{\text{first\_name, last\_name}}((\text{SALE} \bowtie_{\text{customer\_id=customer\_id}} \text{CUSTOMER}) \div \text{DZCars})$$

5) **Query 5 (AVG):** Retrieve the average price of all sales made by salesman Joe Simons.

$$\tau_{\text{AVG}}(\Pi_{\text{price}}(\sigma_{\text{staff\_id=2}}(\text{SALE})))$$

6) **Query 6 (JOINS):** Retrieve first names of all customers and their salesman, as well as the color of the car sold.

$$\Pi_{\text{s\_fname,first\_name,color}}((\rho_{\text{RESULT(s\_fname,color,sid)}}(\Pi_{\text{first\_name,color,sid}}((\text{SALE} \bowtie_{\text{vin=vin}} \text{CAR}) \bowtie_{\text{cid=cid}} \text{CUSTOMER}))) \bowtie_{\text{sid=sid}} \text{STAFF})$$