Exercise 3

Query 1

$$Q1 = \pi_{sname,color}(Catalog \bowtie Suppliers)$$

Query 2

$$Q2 = \pi_{pname,color}(Parts \bowtie Catalog \bowtie (\sigma_{sname='PerfunctoryParts'}(Suppliers))$$

Query 3

$$Q3 = \pi_{sname}((\sigma_{cost<100}(Catalog) \bowtie Suppliers) \bowtie (\sigma_{color='red'}(Parts))$$

Let's have R1 and R2 shuch that :

$$\rho(R1, \pi_{sname}((\sigma_{color='red'}(Parts)) \bowtie (\sigma_{cost<100})$$
$$\rho(R2, \pi_{sname}((\sigma_{color='green'}(Parts)) \bowtie (\sigma_{cost<100})$$

Query 4

$$Q4 = \pi_{sname}((R1 \cup R2) \bowtie Suppliers)$$

Query 5

$$Q5 = \pi_{sname}((R1 \cap R2) \bowtie Suppliers)$$

Query 6

Let's have R1 and R2 shuch that :

$$\rho(R1, Catalog)$$
$$\rho(R2, Catalog)$$
$$Q6 = \pi_{pid}(\sigma_{R1.pid=R2.pid \wedge R1.sid=R2.sid})(R1 \times R2)$$

Query 7

let's have :

$$\rho(S_{neg}, \pi_{sid}(Catalog) \times \pi_{pid}((\sigma_{color='red'}(Parts)) - \pi_{sid,pid}(Catalog))$$
$$Q7 = \pi_{sname}(\pi_{sid}(Catalog) - S_{neg}) \bowtie Suppliers)$$

Query 8

$$Q8 = \pi_{sname}((\pi_{sid}(Catalog) - \pi_{cost>=100}(Catalog)) \bowtie Suppliers)$$