Task:

Suppliers (sid: integer, sname: string, address: string)

Parts (pid: integer, pname: string, color: string)

Catalog (sid: integer, pid: integer, cost: real)

1) Find the names of suppliers who supply some red part.
   $\Pi_{sname}(\Pi_{sid}((\Pi_{pid}\sigma_{color=red}\ Parts) \bowtie Catalog) \bowtie Suppliers)$

2) Find the sids of suppliers who supply some red or green part.
   $\Pi_{sid}(\Pi_{pid}(\sigma_{color=red\ \vee\ color=green}\ Parts) \bowtie Catalog)$

3) Find the sids of suppliers who supply some red part or are at 221 Packer Street.
   $\Pi_{sid}((\Pi_{pid}\sigma_{color=red}\ Parts) \bowtie Catalog))\ U\ \Pi_{sid}\ \sigma_{\ address=221PackerStreet}\ Suppliers)$

4) Find the sids of suppliers who supply some red part and some green part.
   $\Pi_{sid}((\Pi_{pid}\ \sigma_{color=red}\ Parts)\ |\ Catalog))\ \cap\ \Pi_{sid}((\Pi_{pid}\ \sigma_{color=green}\ Parts) \bowtie Catalog))$

5) Find the sids of suppliers who supply every part
   $(\Pi_{sid,pid}\ Catalog)\ /\ (\Pi_{pid}\ Parts)$

6) Find the sids of suppliers who supply every red part.
   $(\Pi_{sid,pid}\ Catalog)\ /\ (\Pi_{pid}\ \sigma_{color=red}\ Parts)$

7) Find the sids of suppliers who supply every red or green part.
   $(\Pi_{sid,pid}\ Catalog)\ /\ (\Pi_{pid}\ \sigma_{color=red\ \vee\ color=green}\ Parts)$

8) Find the sids of suppliers who supply every red part or supply every green part
   $((\Pi_{sid,pid}\ Catalog)\ /\ (\Pi_{pid}\ \sigma_{color=red}\ Parts))\ U\ ((\Pi_{sid,pid}\ Catalog)\ /\ (\Pi_{pid=green}\ Parts))$

9) Find pairs of sids such that the supplier with the first sid charges more for some part than the supplier with the second sid.
   $\rho(A,Catalog)$

   $\rho(B,Catalog)$

   $\Pi_{A.sid,B.sid}(\sigma_{A.pid=B.pid\ \wedge\ A.sid\ !=\ B.sid\ \wedge\ A.cost\ >\ B.cost}\ (A \times B))$

10) Find the pids of parts supplied by at least two different suppliers.

ρ(A, Catalog)

ρ(B, Catalog)

$\Pi_{X.pid}$ ($\sigma_{A.pid=B.pid} \wedge \sigma_{A.sid != B.sid}$ (A × B))