Assignment 1

Suppliers(sid, sname, address)

Parts(pid, pname, color)

Catalog(sid, pid, cost)

1. $R_1 = \sigma_{color = "red"}(Parts)$

   $R_2 = \pi_{pid}(R_1)$ $\quad \pi_{sname}(\pi_{sid}(\pi_{pid}(\sigma_{color="red"}(Parts)) \bowtie Catalog) \bowtie Suppliers)$

   $R_3 = R_2 \bowtie Catalog$

   $R_4 = \pi_{sid}(R_3)$

   $R_5 = R_4 \bowtie Suppliers$

   $R_6 = \pi_{sname}(R_5)$

2. $R_1 = \sigma_{color = "red" \text{ or } color = "green"}(Parts)$

   $R_2 = \pi_{pid}(R_1)$ $\quad \pi_{sid}(\pi_{pid}(\sigma_{color="red" \text{ or } color="green"}(Parts)) \bowtie Catalog)$

   $R_3 = R_2 \bowtie Catalog$

   $R_4 = \pi_{sid}(R_3)$

3. $R_1 = \sigma_{color = "red"}(Parts)$ $\quad R_5 = \sigma_{address = "21 George Street"}(Suppliers)$

   $R_2 = \pi_{pid}(R_1)$ $\quad R_6 = \pi_{sid}(R_5)$

   $R_3 = R_2 \bowtie Catalog$

   $R_4 = \pi_{sid}(R_3)$ $\quad R_7 = R_4 \cup R_5$

   $\pi_{sid}(\pi_{pid}(\sigma_{color="red"}(Parts)) \bowtie Catalog) \cup \pi_{sid}(\sigma_{address="21 George Street"}(Suppliers))$

4. $R_1 = \sigma_{color = "red"}(Parts)$ $R_7 = \sigma_{address = "21 George Street"}(Suppliers)$

$R_2 = \pi_{pid}(R_1)$ $R_8 = \pi_{sname}(R_7)$

$R_3 = R_2 \bowtie Catalog$

$R_4 = \pi_{sid}(R_3)$ $R_9 = R_6 \cup R_8$

$R_5 = R_4 \bowtie Suppliers$

$R_6 = \pi_{sname}(R_5)$

$\pi_{sname}(\pi_{sid}(\pi_{pid}(\sigma_{color = "red"}(Parts)) \bowtie Catalog) \bowtie Suppliers) \cup$
$\pi_{sname}(\sigma_{address = "21 George Street"}(Suppliers))$

5. $R_1 = \sigma_{color = "red"}(Part)$ $R_4 = \sigma_{color = "green"}(Part)$

$R_2 = \pi_{pid}(R_1)$ $R_5 = \pi_{pid}(R_4)$

$R_3 = R_2 \bowtie Catalog$ $R_6 = R_5 \bowtie Catalog$

$R_4 = \pi_{sid}(R_3)$ $R_7 = \pi_{sid}(R_6)$

$R_8 = R_4 \cap R_7$

$\pi_{sid}(((\pi_{pid}(\sigma_{color = "red"}(Part)) \bowtie Catalog) \cap$
$\pi_{sid}(((\pi_{pid}(\sigma_{color = "green"}(Part)) \bowtie Catalog)$

6. $R_1 = \sigma_{cost > 50}(Catalog)$ $R_2 = \sigma_{cost \leq 50}(Catalog)$

$R_3 = \pi_{sid, pid}(R_1)$ $R_4 = \pi_{sid, pid}(R_2)$

$R_5 = \rho_{C1(sid1, pid)}(R_3)$ $R_6 = \rho_{C2(sid2, pid)}(R_4)$

$R_7 = R_5 \bowtie R_6$

$R_8 = \pi_{(sid1, sid2)}(R_7)$

$\pi_{(sid1, sid2)}((\rho_{C1(sid1, pid)}(\pi_{(sid, pid)}(\sigma_{cost > 50}(Catalog)))) \bowtie$
$\rho_{C2(sid2, pid)}(\pi_{(sid, pid)}(\sigma_{cost \leq 50}(Catalog))))$

7. $R_1 = \sigma_{color != "red"}(Part)$

$R_2 = Parts - R_1$

$R_3 = \pi_{pid}(R_2)$

$R_4 = R_3 \bowtie Catalog$

$R_5 = \pi_{sid}(R_4)$

$\pi_{sid}(\pi_{pid}(Part - \sigma_{color != "red"}(Part)) \bowtie Catalog)$

8. $R_1 = \pi_{pid}(Part)$

$R_2 = \pi_{sid}(Catalog)$

$R_3 = R_1 \times R_2$

$R_4 = \pi_{sid,pid}(Catalog)$

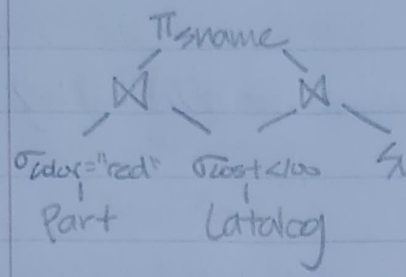
$R_5 = R_3 - R_4$

$R_6 = \pi_{sid}(R_5)$

$R_7 = R_2 - R_6$

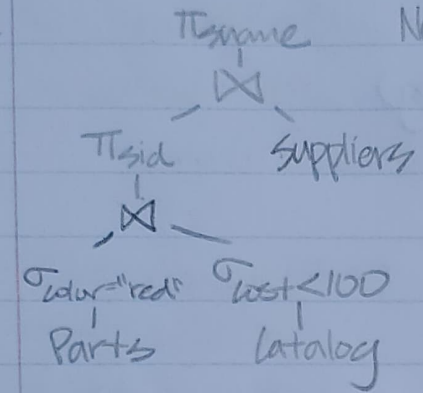
$\pi_{sid}(Catalog) - \pi_{sid}((\pi_{pid}(Part) \times \pi_{sid}(Catalog)) - \pi_{sid,pid}(Catalog))$

1.



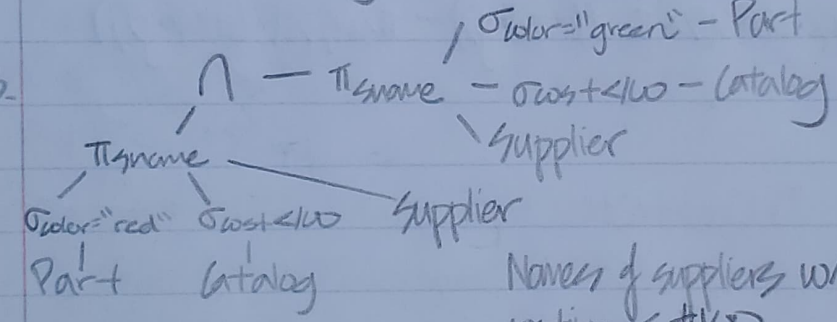
Names of suppliers w/ parts costing < $100

2.



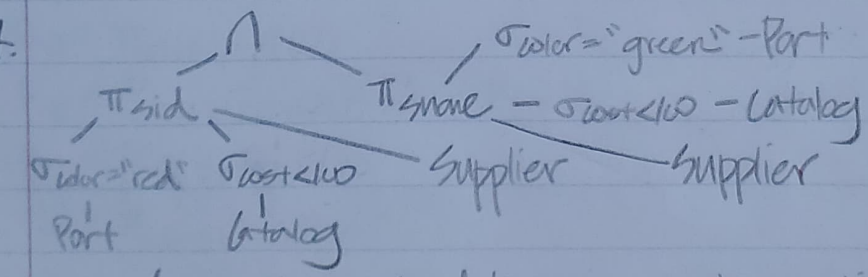
Names of suppliers w/ parts costing < $100

3.



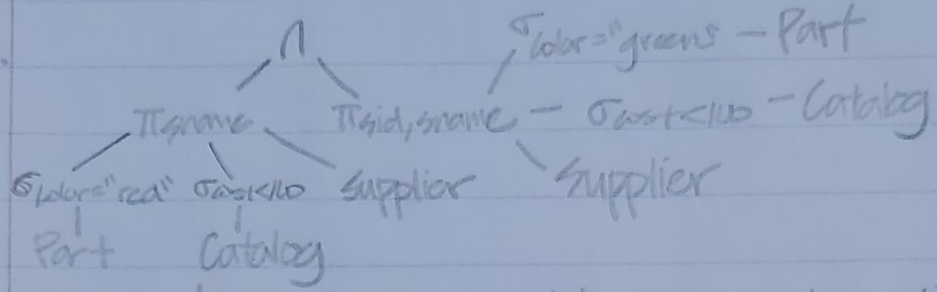
Names of suppliers w/ red & green parts costing < $100

4.



sids of suppliers w/ red & green parts costing < $100

5.



Names of suppliers w/ red & green parts costing < $100, sids included if they have green parts