

Ex 1

1. Find the names of suppliers who supply some red part.
2. Find the sids of suppliers who supply some red or green part.
3. Find the sids of suppliers who supply some red part or are at 221 Packer Street.
4. Find the sids of suppliers who supply some red part and some green part.
5. Find the sids of suppliers who supply every part.
6. Find the sids of suppliers who supply every red part.
7. Find the sids of suppliers who supply every red or green part.
8. Find the sids of suppliers who supply every red part or supply every green part.
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.
10. Find the pids of parts supplied by at least two different suppliers.

$$1. \pi_{\text{name}} (\sigma_{\text{color}='red'} (\text{Parts} \bowtie \text{Catalog}) \bowtie \text{Suppliers})$$

$$2. \pi_{\text{sid}} (\sigma_{\text{color}='red' \text{ OR } \text{color}='green'} (\text{Parts} \bowtie \text{Catalog}))$$

$$3. \pi_{\text{sid}} (\sigma_{\text{color}='red'} (\text{Parts} \bowtie \text{Catalog})) \cup \pi_{\text{sid}} (\sigma_{\text{address}='221 Packer Street'} (\text{Suppliers}))$$

$$4. \pi_{\text{sid}} (\sigma_{\text{color}='red'} (\text{Parts} \bowtie \text{Catalog})) \bowtie \pi_{\text{sid}} (\sigma_{\text{color}='green'} (\text{Parts} \bowtie \text{Catalog}))$$

$$5. \pi_{\text{sid}} (\text{Catalog}) \setminus \pi_{\text{sid}} (\pi_{\text{sid}} (\text{Catalog}) \times \pi_{\text{pid}} (\text{Parts})) \setminus \pi_{\text{sid, pid}} (\text{Catalog})$$

$$6. \pi_{\text{sid}} (\text{Catalog}) \setminus \pi_{\text{sid}} (\pi_{\text{sid}} (\text{Catalog}) \times \pi_{\text{pid}} (\sigma_{\text{color}='red'} (\text{Parts}))) \setminus \pi_{\text{sid, pid}} (\text{Catalog})$$

$$7. \pi_{\text{sid, pid}} (\text{Catalog}) \div (\pi_{\text{pid}} (\sigma_{\text{color}='red' \text{ OR } \text{color}='green'} (\text{Parts})))$$

$$8. \pi_{\text{sid, pid}} (\text{Catalog}) \div (\pi_{\text{pid}} (\sigma_{\text{color}='red'} (\text{Parts}))) \cup \pi_{\text{sid, pid}} (\text{Catalog}) \div (\pi_{\text{pid}} (\sigma_{\text{color}='green'} (\text{Parts})))$$

$$9. \rho (\text{Catalog}) \rightarrow L$$

$$\rho (\text{Catalog}) \rightarrow R$$

$$\pi_{L.\text{sid}, R.\text{sid}} (\sigma_{L.\text{cost} > R.\text{cost} \text{ AND } L.\text{sid} \neq R.\text{sid} \text{ AND } L.\text{pid} = R.\text{pid}} (L \times R))$$

$$10. \rho (\text{Catalog}) \rightarrow L$$

$$\rho (\text{Catalog}) \rightarrow R$$

$$\pi_{L.\text{pid}} (\sigma_{L.\text{pid} = R.\text{pid} \text{ AND } L.\text{sid} \neq R.\text{sid}} (L \times R))$$

Ex 2

For the previous schema, state what the following queries compute:

1. $\pi_{sname} (\pi_{sid} ((\sigma_{color=red} Parts) \bowtie (\sigma_{cost < 100} Catalog)) \bowtie Suppliers)$
2. $\pi_{sname} ((\sigma_{color=red} Parts) \bowtie (\sigma_{cost < 100} Catalog)) \bowtie Suppliers) \cap \pi_{sname} ((\sigma_{color=green} Parts) \bowtie (\sigma_{cost < 100} Catalog) \bowtie Suppliers)$
3. $\pi_{sid} ((\sigma_{color=red} Parts) \bowtie (\sigma_{cost < 100} Catalog) \bowtie Suppliers) \cap \pi_{sid} ((\sigma_{color=green} Parts) \bowtie (\sigma_{cost < 100} Catalog) \bowtie Suppliers)$
4. $\pi_{sname} ((\pi_{sid, name} ((\sigma_{color=red} Parts) \bowtie (\sigma_{cost < 100} Catalog)) \bowtie Suppliers) \cap \pi_{sid, name} ((\sigma_{color=green} Parts) \bowtie (\sigma_{cost < 100} Catalog) \bowtie Suppliers)))$

1. Find the names of suppliers who supply some red parts under 100\$ cost.
2. Find the names of suppliers who supply some red parts and some green parts under 100\$ cost.
3. Find the sids of suppliers who supply some red parts and some green parts under 100\$ cost.
4. Find the names of suppliers who supply some red parts under 100\$ cost or supply some green parts under 100\$ cost.