**Question 1a:**

Answer <- $\Pi_{L1}(\sigma_{C1 \wedge (C2 \vee C3)}(S1 \ldots SmxR1 \ldots Rm))$

**Question 1b:**

Answer <- $\Pi_{L1}(\sigma_{C1 \wedge C2 \wedge C3}(S1 \ldots SmxR1 \ldots Rm))$

**Question 1c:**

Answer <- $\Pi_{L1}(\sigma_{C1 \wedge C2}(S1 \ldots SmxR1 \ldots Rm) - \sigma_{C3}(S1 \ldots SmxR1 \ldots Rm))$

**Question 1d:**

Answer <- $\Pi_{L1}(\sigma_{C1}(R1 \ldots Rm) - \Pi_{s1,sm}(\sigma_{C2 \vee C3}(S1 \ldots Sm)))$

**Question 1e:**

Answer <- $\Pi_{L1}(\sigma_{C1}(R1 \ldots Rm) - \Pi_{s1,sm}(\sigma_{C2 \wedge C3}(S1 \ldots Sm)))$

**Question 1f:**

Answer <- $\Pi_{L1}(\sigma_{C1}(R1 \ldots Rm) - \Pi_{s1,sm}(\sigma_{C2}(S1 \ldots Sm) - \sigma_{C3}(S1 \ldots Sm)))$

**Question 2:**

Answer <- $\Pi_{pid}(P \bowtie_{K.pid1 = P.pid} K \bowtie_{K1.pid1 = P.pid \wedge K.pid2 = K1.pid2} K1 \bowtie_{(W.pid = K.pid2 \vee w.pid = K1.pid2) \wedge (W.cname = \text{‘Apple’} \vee w.cname = \text{‘Netflix’})} W)$

**Question 3:**

R <- $\sigma_{pid,\ cname}(W \bowtie_{C.cname = W.cname \wedge P.pid = W.pid} P \bowtie_{hM.mid = P.pid} hM \bowtie_{pS.pid = hM.mid} pS \bowtie_{pS1.pid = hM.mid \wedge pS.skill <> pS1.skill} pS1)x(C))$

R1 <- $\sigma_{pid,\ cname}(\sigma_{P1.city = \text{‘Seattle’}}(\sigma_{K.pid1= P.pid \wedge K.pid2 = P1.pid} K) \times (PxWxP1))$

Answer <- $\sigma_{pid,\ cname}(R - R1)$

## Question 4:

Answer <- $\Pi_{skill}(\sigma_{P.city = \text{'Bloomington'} \vee P1.city = \text{'Bloomington'}}(S \bowtie_{pS.skill = S.skill} pS \bowtie_{pS1.skill = S.skill \wedge pS1.pid <> pS.pid} pS1 \bowtie_{P.pid = pS.pid} P \bowtie_{P1.pid = pS1.pid} P1))$

## Question 5:

Answer <- $\Pi_{pid, salary}(\sigma_{pid, salary}(W \bowtie_{K.pid2 = W.pid} K \bowtie_{W1.pid = K.pid1} W1 \bowtie_{W.cname = C.cname \wedge C.headquater = \text{'MountainView'}} C) - \sigma_{pid, salary}(W \bowtie_{K.pid2 = W.pid} K \bowtie_{W2.pid = K.pid1} W2 \bowtie_{W2.salary < W1.salary} W1))$

## Question 6:

Answer <- $\Pi_{cname}(C \bowtie_{W.cname = C.cname} W \bowtie_{pS.pid = W.pid \wedge pS.skill = \text{'OperatingSystems'}} pS \bowtie_{W1.cname = W.cname} W1 \bowtie_{W2.cname = W.cname} W2 \bowtie_{P.pid = W1.pid} P \bowtie_{P1.pid = W2.pid \wedge P.city <> P1.city} P1)$