CS 143 Homework 1

Jiaping Zeng

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1. $(R - S) \cup (S - R)$

A	B	C
7	5	3
1	4	3
6	7	9
1	4	4
8	3	2

2. $\sigma_{R.L>S.M \wedge R.M<S.P}(R \times S)$

R.L	R.M	S.M	S.N	S.P
4	3	1	6	4
4	3	3	4	7
6	5	3	4	7
8	7	6	1	8

3. Let us abbreviate *Student* as S, *Course* as C and *Enrollment* as E. In addition let sn denote $Student - name$, cn denote $Course - name$ and dp denote $Department$.

   (a) $\Pi_{sn}(S) - \Pi_{sn}(\sigma_{cn=\text{"Database Management Systems"}}(E))$

   (b) $\Pi_{sn}(S) - \Pi_{S.sn}(\sigma_{C.dp=S.dp}(\sigma_{C.cn=E.cn}(C \times \sigma_{S.sn=E.sn}(S \times E))))$

   (c) $\Pi_{cn}(C) - \Pi_{cn}(E)$

   (d) $\Pi_{S.dp}(\sigma_{S.sn=E.sn}(S \times \sigma_{C.dp=\text{"CS"} \wedge C.cn=E.cn}(C \times E)))$

   (e) $\Pi_{S.dp}(\sigma_{S.sn=s1.sn}(S \times \rho_{s1}(\Pi_{sn}(S) - \Pi_{e1.sn}(\sigma_{e1.sn=e2.sn \wedge e1.cn \neq c2.cn}(\rho_{e1}(E) \times \rho_{e2}(E))))))$

4. $\Pi_{company-name}(Company) - \Pi_{c.company-name}(\sigma_{c.valuation>d.valuation}(\rho_c(Company) \times \rho_d(Company)))$