Wilsen Kosasih
CS143
HW#1

1)
R-S

A	B	C
4	5	6
1	2	6

S-R

A	B	C
2	5	3

(R-S) U (S-R)

A	B	C
4	5	6
1	2	6
2	5	3

2)
RxS

R.A	R.B	S.B	S.C	S.D
1	2	2	4	6
1	2	8	6	8
1	2	7	5	9
3	4	2	4	6
3	4	8	6	8
3	4	7	5	9
5	6	2	4	6
5	6	8	6	8
5	6	7	5	9

RxS, R.A < S.C ^ R.B < S.D

R.A	R.B	S.B	S.C	S.D
1	2	2	4	6
1	2	8	6	8
1	2	7	5	9
3	4	2	4	6
3	4	8	6	8
3	4	7	5	9
5	6	8	6	8

3)

a) $\pi_{\text{customer-name}}(\sigma_{\text{branch-name='Region12'}}\text{Account})$

b) $\pi_{\text{customer-name}}(\sigma_{\text{br.city>cusacc.city}}$ (
ρ_{cusacc} ($\sigma_{\text{Customer.customer-name=Account.customer-name}}$ (Customer x Account))
x ρ_{br}Branch
))

c) ($\pi_{\text{customer-name}}$Branch) – ($\pi_{\text{customer-name}}$Account)

d) ($\pi_{\text{customer-name}}$Customer) – ($\pi_{\text{customer-name}}(\sigma_{\text{branch-name='Region12'}}$Account))

e) ($\pi_{\text{customer-name}}$Customer) – ($\pi_{\text{customer-name}}$(
($\pi_{\text{customer-name}}$Customer x $\pi_{\text{branch-name}}(\sigma_{\text{city='Los Angeles'}}$Branch))
- $\pi_{\text{customer-name,branch-name}}$(
$\sigma_{\text{Branch.branch-name=Account.branch-name}}$ (($\sigma_{\text{city='Los Angeles'}}$Branch) x Account)
)
))

f) ($\pi_{\text{customer-name}}$Account) - ($\pi_{\text{customer-name}}$(
$\sigma_{\text{acc1.account-number>acc2.account-number}}$(
$\sigma_{\text{acc1.customer-name=acc2.customer-name}}$(
ρ_{acc1}Account x ρ_{acc2}Account
)
)
))

4)

(π_{sid}Student) – (
$\pi_{\text{sid}}(\sigma_{\text{s1.sid!=s2.sid}}(\sigma_{\text{s1.GPA>s2.GPA}}(\rho_{\text{s1}}\text{Student x }\rho_{\text{s2}}\text{Student})))$
)