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CS143
HW1

Q1.

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

Q2.

A	R.B	S.B	C	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

Q3.

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

(b) $\pi_{customer-name}(\sigma_{A.city<>B.city \wedge A.branch-name=B.branch-name}(\rho B(Branch) \times \rho A(Customer \bowtie Account)))$

(c) $\pi_{branch-name}(Branch) - \pi_{branch-name}(Account)$

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

(e) $Customer \div (\sigma_{city='LosAngeles'}(Branch))$

(f) $\pi_{customer-name}(Account) - \pi_{A.customer-name}(\sigma_{(A.branch-name<>B.branch-name UA.account-number<>B.account-number) \wedge A.customer-name=B.customer-name}(\rho A(Account) \times \rho B(Account)))$

Q4.

$\pi_{sid}(student) - \pi_{A.sid}(\sigma_{A.gpa>B.gpa \wedge A.sid<>B.sid}(\rho A(Student) \times \rho B(Student)))$

Q5.

$\pi_{customer-name}(Customer) -$

$\pi_{customer-name}(\pi_{customer-name}(Customer) \times \pi_{branch-name}(\sigma_{city='LosAngeles'}(Branch)) -$

$\pi_{customer-name,branch-name}(Account))$

Q6.

Integer Division: It calculates the time of an integer is contained in another integer. For example, 8 contains 4 twice.

Relation Algebra Division: S(A,B) ÷ R(B) we want to find a set of A in S which are connected with all values of B in R.

For example :

S:

A	B
1	a
2	a
2	b
4	a

R:

B
a
b

S(A,B) ÷ R(B):

A
2