

CS 405-001
Assignment 2

Problem 1
6.16

- a. $TEMP = (EMPLOYEE \bowtie_{Ssn=Essn} WORKS_ON) \bowtie_{Pno=Pnumber} PROJECT$
 $SOLUTION = \pi_{Fname, Minit, Lname} (\sigma_{Pname='ProductX' \ \& \ Hours > '10' \ \& \ Dno='5'} TEMP)$

Fname	Minit	Lname
John	B	Smith
Joyce	A	English

- b. $TEMP = EMPLOYEE \bowtie_{Ssn=Essn \ \& \ Fname=Dependent_name} DEPENDENT$
 $SOLUTION = \pi_{Fname, Minit, Lname} TEMP$

Fname	Minit	Lname
No Rows		

- c. $MSSN = \pi_{Ssn} (\sigma_{Fname='Franklin' \ \& \ Lname > 'Wong'} EMPLOYEE)$
 $TEMP = EMPLOYEE \bowtie_{Super_ssn=MSSN.Ssn} MSSN$
 $SOLUTION = \pi_{Fname, Minit, Lname} TEMP$

Fname	Minit	Lname
John	B	Smith
Ramesh	K	Narayan
Joyce	A	English

- d. $SOLUTION = Pname \bowtie SUM\ Hours(WORKS_ON \bowtie_{Pno=Pnumber} PROJECT)$

Pname	Sum_hours
ProductX	52.5
ProductY	37.5
ProductZ	50.0
Computerization	55.0
Reorganization	25.0
Newbenefits	55.0

- e. $AMOUNT = \bowtie COUNT\ Pnumber (PROJECT)$
 $TEMP = \sigma_{Count_pno=AMOUNT.Count_Pnumber} (Essn \bowtie COUNT\ Pno (WORKS_ON))$
 $SOLUTION = \pi_{Fname, Minit, Lname} (EMPLOYEE \bowtie_{Ssn=Essn} TEMP)$

Fname	Minit	Lname
No Rows		

- f. $NONWORKERS = \pi_{Ssn} (EMPLOYEE) - \rho_{TEMP(Ssn)} (\pi_{Essn} (WORKS_ON))$
 $TEMP = EMPLOYEE \bowtie_{EMPLOYEE.Ssn=NONWORKERS.Ssn} NONWORKERS$
 $SOLUTION = \pi_{Fname, Minit, Lname} TEMP$

Fname	Minit	Lname
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No Rows

g. $SALARIES = Dno \bowtie AVERAGE\ Salary (EMPLOYEE)$
 $SOLUTION = \pi_{Dname, Average_salary} (DEPARTMENT \bowtie_{Dnumber = Dno} SALARIES)$

Dname	Average_salary
Research	33250
Administration	31000
Headquarters	55000

h. $SOLUTION = \bowtie AVERAGE\ Salary (\sigma_{Sex='F'} EMPLOYEE)$

Average_salary
31000

i. $HOUSTON_PROJECTS = \pi_{Pnumber} (\sigma_{Plocation='Houston'} PROJECT)$
 $HOUSTON_DEPTS = \pi_{Dnumber} (\sigma_{Dlocation='Houston'} DEPT_LOCATIONS)$
 $NON_HOUSTON_DEPTS = (\pi_{Dnumber} DEPT_LOCATIONS) - HOUSTON_DEPTS$
 $HOUS_PROJ_WORKER = \pi_{Essn} (WORKS_ON \bowtie_{Pno=Pnumber} HOUSTON_PROJECTS)$
 $TEMP = EMPLOYEE \bowtie_{Ssn=Essn} HOUS_PROJ_WORKER$
 $SOLUTION = \pi_{Fname, Minit, Lname, Address} (TEMP \bowtie_{Dno=Dnumber} NON_HOUSTON_DEPTS)$

Fname	Minit	Lname	Address
Jennifer	S	Wallace	291 Berry, Bellaire, TX

j. $TEMP = \rho_{A(Ssn)} (\pi_{Mgr_ssn} DEPARTMENT) - \rho_{B(Ssn)} (\pi_{Essn} DEPENDENT)$
 $SOLUTION = \pi_{Lname} (EMPLOYEE * TEMP)$

Lname
Borg

Problem 2
6.20

a. $TEMP = \sigma_{Amount > '2000'} (TRIP * EXPENSE)$
 $SOLUTION = \pi_{Ssn, From_city, To_city, Departure_date, Return_date, Trip_id} TEMP$

b. $SOLUTION = \pi_{Ssn} (\sigma_{To_city='Honolulu'} TRIP)$

c. $TEMP = \sigma_{Ssn='234-56-7890'} TRIP$
 $SOLUTION = \bowtie SUM\ Amount (TEMP * EXPENSE)$

Problem 3
6.22

a.

P	Q	R	A	B	C
10	a	5	10	b	6
10	a	5	10	b	5
25	a	6	25	c	3

b.

P	Q	R	A	B	C
15	b	8	10	b	6
15	b	8	10	b	5

c.

P	Q	R	A	B	C
10	a	5	10	b	6
10	a	5	10	b	5
15	b	8	NULL	NULL	NULL
25	a	6	25	c	3

d.

P	Q	R	A	B	C
15	b	8	10	b	6
NULL	NULL	NULL	25	c	3
15	b	8	10	b	5

e.

P	Q	R
10	a	5
15	b	8
25	a	6
10	b	6
25	c	3
10	b	5

f.

P	Q	R	A	B	C
10	a	5	10	b	5