CSCI 511
Assignment 2

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8.16

8.16a

// find a table including the SSN who work more than 10 hours and works on ProjectX
$A \leftarrow (\sigma_{(Hours>10)}WORKS\_ON) \bowtie_{(Pno = Pnumber)}(\sigma_{(Pname = 'ProjectX')}(Project))$
//find the person by using A's SSN and EMPLOYEE's departemt numer
$RESULTS \leftarrow \pi_{Fname, Lname}(EMPLOYEE \bowtie_{(ssn = Essn/\backslash Dno = 5)}A)$

8.16b
$RESULTS \leftarrow \pi_{Fname, Lname}(EMPLOYEE \bowtie_{((EMPLOYEE.ssn = DEPENDENT.ssn) /\backslash (EMPLOYEE.Fname = Dependent\_name))} DEPENDENT)$

8.16c
// find the Wong's SSN
$A \leftarrow \pi_{ssn}(\sigma_{(FNAME = 'Franklin'/\backslash LNAME = 'wong')}EMPLOYEE)$
// using Wong's SSN to join the EMPLOYEE's Super_ssn
$RESULTS \leftarrow \pi_{Fname,Lname}(EMPLOYEE \bowtie_{(EMPLOYEE.Super\_ssn = A.Ssn)}A)$

8.16d
// join Project and WORKS_ON by project's ID
$A \leftarrow Project \bowtie_{(Project.Pnumber = Pho)} WORKS\_ON$
// sum the hours by Pname
$RESULTS \leftarrow \pi_{Pname, sum\_hours}((Pname)F_{(sum(A.hours))})$

8.16e
$RESULTS \leftarrow \pi_{Fname,Lname,pno}(WORK\_ON \bowtie_{(Essn = Ssn)} EMPLOYEE) / \pi_{Pnumber}(POJECT)$
8.16f
// all the employee's name set – name set of employee who have project.
$RESULTS \leftarrow \pi_{Fname,Lname}(EMPLOYEE) - \pi_{Fname,Lname}(WORK\_ON \bowtie_{(Essn = Ssn)} EMPLOYEE)$

8.16g
//

A ← EMPLOYEE $\bowtie_{(Dno = Dnumber)}$ DEPARTMENT
RESULTS ← $_{(Dname)}F_{(average(A.salary))}$

8.16 h
// select all the female employee
A ← $\sigma_{(sex='M')}$(EMPLOYEE)
// calculate the average
RESULTS ← $F_{(average(A.salary))}$

8.16 i
// link EMPLOYEE and PROJECT and select the project's location in Houston
A ← $\sigma_{(Plocation = Houston)}$ ((EMPLOYEE $\bowtie_{(ssn = Essn)}$ WORKS_ON) $\bowtie_{(Pno = Pnumber)}$PROJECT)
// select A and DEP_LOCATION, and select the department's location not in Houston
B ← $\sigma_{(Dlocation \sim= Houston)}$ (A $\bowtie_{(Dno = Dnumber)}$ DEPT_LOCATION)
RESULTS ← $\pi_{Lname,Fname,Address}$(B)

8.16j
//all manager's SSN set – the SSN set of manager having depends.
A ← π_{ssn} (DEPARTMENT $\bowtie_{(Mgr_ssn = Ssn)}$EMPLOYEE) – π_{ssn} (EMPLOYEE$\bowtie_{(ssn = Essn)}$ DEPENDENT)
//show their last name
RESULTS ← π_{Lname} (A* EMPLOYEE)

8.21

8.21 a
A ← (STUDENT$\bowtie_{(Name = 'John Smith' /\ Quarter == 'W09' /\ STUDENT.Ssn = ENROLL.Ssn)}$ENROLL)
RESULTS ← = $\pi_{(Course\#)}$ (A)

8.21 b
// A includes all the books used by the CS department
A ← COURSE$\bowtie_{(Dept = 'CS' /\ COURSE.Course\# = ADOPTION .Course\#)}$BOOK_ADOPTION
A_1 ← A
A_2 ←A
//joining A_1 and A_2, and selecting the item whose courses are the same but books are different
B ← $\pi_{(Book\_isbn,course\#)}$ (A_1 $\bowtie_{(A\_1.course\# = A\_2.course\#/\A\_1.Book\_isbn \sim= A\_2.Book\_isbn)}$ A_2)

RESULTS ← $\pi_{(Book\_isbn,\ Book\_title,Course\#)}$ (B*TEXT)

8.21 c
// select the TEXT book published by Pearson publishing
A ← $\sigma_{(Publisher = \text{'Pearson Publishing'})}$ (TEXT)
//
RESULTS ← $\pi_{(DEpt)}$ ((A$\bowtie_{(A.Book.isbn = BOOK_ADOPTION.isbn)}$ BOOK_ADOPTION) * COURSE)

8.22

8.22 a

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

8.22 b

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

8.22 c

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

8.22 d

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

8.22 e
Error. Because the two tables are not union compatible.

8.22 f

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

8.38

8.38 a
//link student and their enroll infor
A ←STUDENT $\bowtie_{(STUDENTS.Ssn = ENROLL.Ssn\ )}$ ENROLL
// link A and BOOK_ADOPTION
B ← A $\bowtie_{(A.Course\# = BOOK\_ADOPTION.Course\#\ )}$ BOOK_ADOPTION
RESULTS ← π_{Name} (B $\bowtie_{(B.Book\_isbn\# = Text.Book\_isbn\#\ /\backslash\ \sigma\ (Publish = `Addison\text{-}Wesley\text{-}Longman'))}$
Text)

8.38 b
A ← BOOK_APOTION
B ← BOOK_APOTION
C ← A$\bowtie_{(A.Course\ \#= B.Course\#/\backslash\ A.Quarter\ \sim= B.\ Quarter\ /\backslash A.Book_isbn\ \sim=B.Book_isbn\ )}$ B
RESULTS ← $\pi_{\ Cname}$ (C$\bowtie_{(C.course\# = COURSE.Course\#)}$COURSE)

8.38 c
A ← Course $\bowtie_{(\ Course.course\# = Book_ADOPTION.Course\#)}$Book_ADOPTION
//B includes the dept used other pubisher's book
B ← $\pi_{\ Dept}$ ($\sigma_{\ (Publish\ \sim= `Addison\text{-}Wesley')}$(A $\bowtie_{(\ A.Book_isbn = Book_ADOPTION.Book_isbn\#)}$Book_ADOPTION))
// all dept – dept used other publisher's book
RESULTS ← $\pi_{\ Dept}$(COURSE) - B

8.38 d
// select book
A ← $\sigma_{\ (Publish = `Addison\text{-}Wesley'/\backslash\ Author = `Navathe')}$(TEXT)
// use selected book find the couese#
B ← A $\bowtie_{(\ A.Book_isbn = Book_ADOPTION.Book_isbn\#)}$Book_ADOPTION
// find dept info
RESULTS ← $\pi_{\ Dept}$ (COURSE $\bowtie_{\ (COURSE.Course\# = B.Course\#)}$(B))

8.38 e
A ←STUDENT$\bowtie_{(\ STUDENT\ .Ssn= ENROLL.Ssn)}$ENROLL

B ←A ⋈(A .Course# = Book_ADOPTION.Course# /\ A .Quater = Book_ADOPTION.Quater#) Book_ADOPTION

C ←π Name (B ⋈(B.Book_isbn = TEXT.isbn /\ TEXT.Author = 'Navathe' /\ Publish = 'Addison-Wesley') TEXT)

// all students - students used the qualified book

RESULTS ←π Name (Studnet) - C