2.10

한 명의 학생이 한 명 이상의 지도교수를 가지면 중복되는 부분이 생기므로 더이상 주 키의 역할에 적합하지 않다. 따라서 advisor의 주 키는 s\_id가 아닌 i\_id가 되어야 한다.

2.12

(a)

**Project** person\_name(**Select** company\_name = “First Bank Corporation”(works))

(b)

**Project** person\_name,city(works **natural join** company)

(c)

**Project** person\_name,street,city(**Select** company\_name = “First Bank Company” **and** salary >= 10,000(works) **natural join** employee)

2.13

(a)

**Project** loan\_number (**Select** amount>10,000(loan))

(b)

**Project** customer\_name (**Select** balance>6,000 (depositor **natural join** account) )

(c)

**Project** customer\_name (**Select** balance>6,000 **and** branch\_name = “Uptown”(depositor **natural join** account))

3.11

(a)

**select** *name*

**from** *student* **natural join** *takes* **natural join** *course*

**where** *course.dept* = ’Comp. Sci.’

(b)

**select** *id, name*

**from** *student*

**except**

**select** *id, name*

**from**

**where** *student*

**natural join** *takes year* < 2009

(c)

**select** *dept*, **max**(*salary*)

**from** *instructor*

**group by** *dept*

(d)

**select min**(*maxsalary*)

**from** (**select** *dept*, **max**(*salary*) **as** *maxsalary* **from** *instructor* **group by** *dept*)

3.12

(a)

**insert into** *course***values** (’CS-001’, ’Weekly Seminar’, ’Comp. Sci.’, 0)

(b)

**insert into** *section***values** (’CS-001’, 1, ’Autumn’, 2009, null, null, null)

(c)

**insert into** *takes*

**select** *id, ’CS-001’, 1, ’Autumn’, 2009, null*

**from** *student*

**where** *dept name* = ’Comp. Sci.’

(d)

**delete from** *takes*

**where** *course id*= ’CS-001’ **and** *section id* = 1 **and**

*year* = 2009 **and** *semester* = ’Autumn’ **and** *id* **in** (**select** *id*

**from** *student***where** *name* = ’Chavez’)

(e)

**delete from** takes

**where** course\_id = ‘CS\_001’;

**delete from** section

**where** course\_id = ‘CS\_001’;

**delete from** course

**where** course\_id = ‘CS\_001’;

- 분반을 먼저 삭제하지 않고 이 삭제를 수행한다면 section relation에서 course relation 의 course\_id를 외래키로 불러올 때 해당 tuple이 없어 오류가 발생한다. takes relation 에서 section relation 의 키를 불러올 때도 마찬가지이다.

(f)

**delete from** *takes* **where** *course id* **in**

(**select** *course id***from** *course***where** lower(*title*) like ’%database%’)

3.14

(a)

**select count** (\*)

**from** *accident*

**where exists** (**select** \*

**from** *participated, owns, person*

**where** *owns.driver id* = *person.driver id*

**and** *person.name* = ’John Smith’ **and** *owns.license* = *participated.license***and** *accident.report number* = *participated.report number*)

(b)

**update** *participated*

**set** *damage amount* = 3000

**where** *report number* = “AR2197” **and** *license* = “AABB2000”)

3.16

(a)

**select** *employee name*

**from** *works*

**where** *company name* = ’First Bank Corporation’

(b)

**select** *e.employee name*

**from** *employee e*, *works w*, *company c*

**where** *e.employee name = w.employee name* **and** *e.city = c.city* **and**  *w.company name = c.company name*

(c)

**select** *P.employee name*

**from** *employee P, employee R, manages M*

**where** *P.employee name = M.employee name* **and** *M.manager name = R.employee name* **and** *P.street = R.street* **and** *P.city = R.city*

(d)

**select** *employee name*

**from** *works T*

**where** *salary* > (**select avg** (*salary*)

**from** *works S*

**where** *T.company name = S.company name*)

(e)

**select** *company name*

**from** *works*

**group by** *company name*

**having sum** (*salary*) <= **all** (**select sum** (*salary*)

**from** *works*

**group by** *company name*)

3.20

**create table** employee

(employee\_name varchar(20),

street char(30),

city varchar(20),

**primary key** (employee\_name));

**create table** works

(employee\_name person\_names,

company\_name varchar(20),

salary numeric(8, 2),

**primary key** (employee\_name));

**create table** company

(company\_name varchar(20),

manager\_name varchar(20),

**primary key** (company\_name));

**create table** manages

(employee\_name varchar(20),

manager\_name varchar(20),

**primary key** (employee\_name));

3.21

(a)

**select** *name*

**from** *member m*, *book b*, *borrowed l*

**where** *m.memb no = l.memb no*  **and** *l.isbn = b.isbn* **and** *b.publisher* = ’McGrawHill’

(b)

**select distinct** *m.name*

**from** *member m*

**where not exists** ((**select** *isbn*

**from** *book*

**where** *publisher* = ’McGrawHill’)

**except**(**select** *isbn*

**from** *borrowed l*

**where** *l.memb no = m.memb no*))

(c)

**select** *publisher*, *name*

**from** (**select** *publisher*, *name*, **count** (*isbn*)

**from** *member m*, *book b*, *borrowed l*

**where** *m.memb no = l.memb no***and** *l.isbn = b.isbn*

**group by** *publisher*, *name*) **as** *membpub(publisher, name, count books)*

**where** *count books* > 5

(d)

**with** *memcount* **as**

(**select count(\*)**

**from** *member*)

**select count(\*)**/memcount

**from** *borrowed*

3.24

**with** *dept total* (*dept name*, *value*) **as**

(**select** *dept name*, **sum**(*salary*)

**from** *instructor*

**group by** *dept name*),

*dept total avg*(*value*) **as**

(**select avg**(*value*)

**from** *dept total*)

**select** *dept name*

**from** *dept total*, *dept total avg*

**where** *dept total.value* >= *dept total avg.value*;