Yunus Emre Ak
1306150001

```
DROP TABLE Teach CASCADE;
DROP TABLE Take CASCADE;
DROP TABLE Teacher CASCADE;
DROP TABLE Course CASCADE;
DROP TABLE Student CASCADE;
DROP TABLE Department CASCADE;

create table Department
 (did numeric(5) not null,
 name varchar(30) not null,
 primary key(did));

create table Student
 (sid numeric(5) not null,
 name varchar(30) not null,
 birthplace varchar(50),
 did numeric(5),
 foreign key (did) references Department(did),
 primary key(sid));

create table Course
 (cid numeric(5) not null,
 title varchar(30) not null,
 credits numeric(2),
 did  numeric(5),
 foreign key (did) references Department(did),
 primary key(cid));

create table Teacher
 (tid numeric(5) not null,
 name varchar(30) not null,
 placeOfBirth varchar(50),
 did numeric(5),
 foreign key (did) references Department(did),
 primary key(tid));

create table Take
 (sid numeric(5) not null,
 cid numeric(5) not null,
 grade float,
 foreign key (sid) references Student(sid),
 foreign key (cid) references Course(cid),
 primary key (sid,cid));

create table Teach
 (tid numeric(5) not null,
 cid numeric(5) not null,
 foreign key (tid) references Teacher(tid),
 foreign key (cid) references Course(cid),
 primary key (tid,cid));
```

```
insert into Department values (1,  'Bilgisayar
Muhendisligi');
insert into Department values (2,  'Endustri
Muhendisligi');
insert into Department values (3,  'Elektrik
Muhendisligi');
insert into Department values (4,  'Kimya
Muhendisligi');
insert into Department values (5,  'Piskoloji');

insert into Student values (1,  'Ali
Dogan',   'istanbul', 1);
insert into Student values (2,  'Ahmet
buyuk','ankara', 1);
insert into Student values (3,  'Leyla
Sahin',  'izmir',   1);
insert into Student values (4,  'Can
Turkoglu','manisa',   2);
insert into Student values (5,  'Aziz
Keskin',  'istanbul', 2);
insert into Student values (6,  'Talat
Sanli',  'izmir',   3);
insert into Student values (7,  'Kamuran
Kece', 'adana',   3);
insert into Student values (8,  'Turgut
Cemal', 'bursa',   4);
insert into Student values (9,  'Oznur
Gunes','bolu',   2);
insert into Student values (10, 'Pelin
Tugay','izmir',  4);
insert into Student values (11, 'Savas
Tan','izmir',   4);

insert into Course values (1,  'Database
Systems', 3,  1);
insert into Course values (2,  'Operating
Systems',3,  1);
insert into Course values (3,  'Introduction to
Programming',  4,  1);
insert into Course values (4,  'introduction to
electronic',2, 2);
insert into Course values (5,  'statistic',4,  4);
insert into Course values (6,  'circuit theory',
3,   2);
insert into Course values (7,  'introduction to
environment',3,   3);
insert into Course values (8,  'operation
research',3, 4);
insert into Course values (9,  'summer
practice', 2,  4);
insert into Course values (10,  'summer
practice',  3,  3);
```

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```
insert into Course values (11,  'summer
practice',  3,  1);
insert into Course values (12,  'summer
practice',  3,  2);

insert into Teacher values (1,  'Selami Durgun',
'amasya',  1);
insert into Teacher values (2,  'Cengiz Tahir',
'istanbul', 1);
insert into Teacher values (3,  'Derya Seckin',
'mersin',   1);
insert into Teacher values (4,  'Dogan Gedikli',
'istanbul',    2);
insert into Teacher values (5,  'Ayten
Kahraman', 'istanbul',   3);
insert into Teacher values (6,  'Tahsin Ugur',
'izmir', 4);
insert into Teacher values (7,  'Selcuk Ozan',
'amasya',    4);
insert into Teacher values (8,  'Bos
Adam', 'Rome', 1);

insert into Teach values (1,    1);
insert into Teach values (3,    2);
insert into Teach values (2,    3);
insert into Teach values (4,    4);
insert into Teach values (7,    5);
insert into Teach values (4,    6);
insert into Teach values (5,    7);
insert into Teach values (6,    8);
insert into Teach values (7,    9);
insert into Teach values (5,    10);
insert into Teach values (1,    11);
insert into Teach values (4,    12);

insert into Take values (1, 1,  75);
insert into Take values (1, 3,  62.5);
insert into Take values (1, 4,  75.5);
insert into Take values (1, 6,  75);
insert into Take values (1, 9,  100);
insert into Take values (1, 10, 75);
insert into Take values (2, 1,  68);
insert into Take values (2, 2,  100);
insert into Take values (2, 3,  4);
insert into Take values (2, 4,  100);
insert into Take values (2, 5,  23);
insert into Take values (2, 6,  100);
insert into Take values (2, 7,  13);
insert into Take values (2, 8,  100);
insert into Take values (2, 9,  100);
insert into Take values (2, 10, 75);
insert into Take values (2, 11, 100);
insert into Take values (3, 1,  100);
insert into Take values (3, 2,  65);
insert into Take values (3, 3,  88);
insert into Take values (3, 4,  71);
insert into Take values (3, 5,  100);
insert into Take values (3, 6,  34);
insert into Take values (3, 7,  23);
insert into Take values (3, 8,  100);
insert into Take values (3, 9,  31);
insert into Take values (3, 10, 75);
insert into Take values (3, 11, 75.5);
insert into Take values (4, 1,  62.5);
insert into Take values (4, 5,  33);
insert into Take values (5, 11, 75.5);
insert into Take values (5, 1,  75);
insert into Take values (5, 5,  33);
insert into Take values (6, 2,  100);
insert into Take values (7, 5,  33);
insert into Take values (7, 1,  62.5);
insert into Take values (7, 8,  33);
insert into Take values (7, 2,  75);
insert into Take values (8, 2,  75.5);
insert into Take values (8, 7,  30);
insert into Take values (9, 3,  21);
insert into Take values (9, 4,  23);
insert into Take values (10,    2,100);
insert into Take values (10,    8,  75);
insert into Take values (11,    8,  25);


-- Vize Soruları Çözümü


-- Student tablosuna “birthDate INTEGER”
sütününu ekleyiniz (ALTER kullan)
ALTER TABLE Student ADD birtDate INTEGER;

-- 5 numaralı (did) bölüme ‘Samsun’ doğumlu
‘Ali KURT’ adlı öğrenciyi ekleyiniz (INSERT
kullan)
INSERT INTO Student (sid, name, birthPlace,
did) VALUES (12, 'Ali KURT', 'Samsun', 5);

-- Öğrencisi olmayan bölümleri Department
tablosundan siliniz. (DELETE kullan)
DELETE FROM Department d WHERE NOT
EXISTS (
   SELECT * FROM Student s WHERE s.did =
d.did
);
```

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```
-- En az 10 adet öğrencinin aldığı derslerin
kredisini 1 arttırınız. (UPDATE kullan)
UPDATE Course SET credits = credits + 1
WHERE credits IN (
   SELECT credits FROM Course c, Take t
WHERE c.cid = t.cid
   GROUP BY (c.cid) HAVING count(sid) >= 10
);

-- Dersten alınan notların ortalaması 50'den
yüksek olan derslerin ders kodunu
-- öğrenci sayılarını SQL ve RA ile listeleyiniz.
SELECT c.cid, count(sid) FROM Take t, Course c
WHERE t.cid=c.cid
GROUP BY c.cid HAVING AVG(grade) > 50;
```

```
 cid | count
-----+-------
  11 |     3
   4 |     4
   6 |     3
  10 |     3
   2 |     6
   1 |     6
   9 |     3
   8 |     5
```

```
-- 'Ali KURT' adlı öğrencinin notlarının
hepsinden daha yüksek bir nota sahip olan
öğrencilerin
-- kayıtlarını SQL ve RA ile listeleyiniz. (&gt;=
ALL kullan)
SELECT DISTINCT s.* FROM Student s, Take t
WHERE s.sid = t.sid AND
grade >= ALL(
   SELECT grade FROM Student s1, Take t1
WHERE
   t1.sid = s1.sid AND s1.name = 'Ali KURT'
);
```

```
   sid |     name     | birthplace | did | birtdate
-------+--------------+------------+-----+----------
     1 | Ali Dogan    | istanbul   |   1 |
     2 | Ahmet buyuk  | ankara     |   1 |
     3 | Leyla Sahin  | izmir      |   1 |
     4 | Can Turkoglu | manisa     |   2 |
     5 | Aziz Keskin  | istanbul   |   2 |
     6 | Talat Sanli  | izmir      |   3 |
     7 | Kamuran Kece | adana      |   3 |
     8 | Turgut Cemal | bursa      |   4 |
     9 | Oznur Gunes  | bolu       |   2 |
    10 | Pelin Tugay  | izmir      |   4 |
    11 | Savas Tan    | izmir      |   4 |
```

```
-- 'Database Systems' dersini alan fakat
'Operating Systems' dersini almayan
öğrencilerin kayıtlarını RA
-- ve SQL ile listeleyiniz.
SELECT DISTINCT s.sid FROM Course c, Student
s, Take t WHERE s.sid = t.sid AND
t.cid = c.cid AND title='Database Systems' AND
s.sid NOT IN (
   SELECT s1.sid FROM Student s1, Take t1,
Course c1 WHERE
   s1.sid = t1.sid AND t1.cid = c1.cid AND
title='Operating Systems'
);
```

```
 sid
-----
   1
   4
   5
```

```
-- 'Bilgisayar Mühendisliği' bölümünde çalışan
ve ders vermeyen (teach tablosundan
bakılacak)
-- hocaların kayıtlarını
-- Exists
SELECT t.* FROM Teacher t, Department d
WHERE t.did = d.did AND
d.name='Bilgisayar Muhendisligi' AND NOT
EXISTS (
   SELECT * FROM Teach t1 WHERE t1.tid =
t.tid
);
```

```
 tid |   name   | placeofbirth | did
-----+----------+--------------+-----
   8 | Bos Adam | Rome         |   1
```

```
-- In
SELECT t.* FROM Teacher t, Department d
WHERE t.did = d.did AND
d.name='Bilgisayar Muhendisligi' AND t.tid IN (
   (SELECT tid FROM Teacher) EXCEPT (SELECT
tid FROM Teach)
);
```

```
 tid |   name   | placeofbirth | did
-----+----------+--------------+-----
   8 | Bos Adam | Rome         |   1
```

Yunus Emre Ak / 1306150001

2.ödev / Veritabanı Yönetim Sistemleri

1-) $\Pi_{c.cid,\ count(grade)} \left(c.cid\ g_{AVG(grade)>50} \left(\sigma_{t.cid=c.cid} \left(\rho_t(Take) \times \rho_c(Course) \right) \right) \right)$

2-) $mygrade \leftarrow \Pi_{grade} \left(\sigma_{t1.sid=st.sid \wedge st.name='Ali\ Kurt'} \left(\rho_{st}(Student) \times \rho_{t2}(Take) \right) \right)$

$\Pi_{s.*} \left(\sigma_{s.sid=t.sid \wedge grade >= ALL(mgrade)} \left(\rho_s(Student) \times \rho_t(Take) \right) \right)$

3-) $os \leftarrow \Pi_{s1.sid} \left(\sigma_{s1.sid=t1.sid \wedge t1.cid=c1.cid \wedge title='Operating\ Systems'} \left(\rho_{s1}(Student) \times \rho_{t_1}(Take) \times \rho_{c1}(Course) \right) \right)$

$\Pi_{s.sid} \left(\sigma_{s.sid=t.sid \wedge t.cid=c.cid \wedge title='Database\ Systems' \wedge s.sid\ NOT\ IN\ (os)} \left(\rho_c(Course) \times \rho_s(Student) \times \rho_t(Take) \right) \right)$

4-) $\Pi_{t.*} \left(\sigma_{t.did=d.did \wedge d.name='Bilgisayar\ Mühendisliği'} \left(\rho_t(Teacher) \times \rho_d(Department) \right) \right) - \Pi_{t.*} \left(\sigma_{t.did=d.did \wedge d.name='Bilgisayar\ Mühendisliği' \wedge te.did=t.did} \left(\rho_t(Teacher) \times \rho_{te}(Teach) \times \rho_d(Department) \right) \right)$