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Databases 336 HW3
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1. Database schema:

```
CREATE TABLE Students(
        sid int,
        name varchar (30),
        age int,
        gpa float,
        PRIMARY KEY (sid)
);

CREATE TABLE Courses(
        cid varchar (7),
        deptid varchar (10),
        name varchar (20),
        PRIMARY KEY (cid)
);

CREATE TABLE Professors(
        ssn int,
        name varchar (30),
        address varchar (50),
        phone varchar (12),
        deptid varchar (10),
        PRIMARY KEY (ssn)
);

CREATE TABLE Teaches(
        cid varchar (7),
        section int,
        ssn int,
        PRIMARY KEY (cid, section),
        FOREIGN KEY (cid) REFERENCES Courses(cid),
        FOREIGN KEY (ssn) REFERENCES Professors(ssn)
);
CREATE TABLE Enrollment(
        sid int,
        cid varchar (7),
        section int,
        grade varchar (1),
        PRIMARY KEY (sid, cid),
        FOREIGN KEY (sid) REFERENCES Students (sid),
        FOREIGN KEY (cid) REFERENCES Courses (cid),
        FOREIGN KEY (cid, section) REFERENCES Teaches (cid, section)
);
```

2.

```
SELECT name
FROM Professors
WHERE deptid = ‘cs’;
```

3.
```
SELECT s.sid
FROM Enrollment e, Courses c, Students s
WHERE s.sid = e.sid and e.cid = c.cid and c.deptid = ‘cs’;
```

4.
```
SELECT ssn, name
FROM Professors
WHERE deptid = ‘cs’ AND ssn not in (SELECT ssn
                                    FROM Teaches
                                    WHERE cid in (SELECT cid
                                                  FROM Courses
                                                  WHERE deptid = ‘cs’));
```

5.
```
SELECT count (cid)
FROM Courses
GROUP BY deptid;
```

6.
```
SELECT deptid
FROM Courses
GROUP BY deptid
HAVING COUNT (cid) > 10;
```

7.
```
SELECT DISTINCT s.name
FROM Students s, Courses c, Professors p, Enrollment e, Teaches t
WHERE s.sid = e.sid and e.cid = c.cid and e.cid = t.cid and t.ssn = p.ssn and p.name
like ‘M%’;
```

8.
```
SELECT courses.deptid, COUNT (sid) < 30 AS ‘Small’,
        COUNT (sid) >= 30 and COUNT (sid) < 80 AS ‘Medium’,
        COUNT (sid) >= 80 AS ‘Large’,
 FROM Enrollment, Courses
 WHERE enrollment.cid = courses.cid
 GROUP BY enrollment.section, courses.cid;
```

9. (using INTO to create a temp table)

```
 SELECT courses.deptid, COUNT (sid) < 30 AS ‘Small’,
        COUNT (sid) >= 30 and COUNT (sid) < 80 AS ‘Medium’,
        COUNT (sid) >= 80 AS ‘Large’,
 FROM Enrollment, Courses
 WHERE enrollment.cid = courses.cid
 GROUP BY enrollment.section, courses.cid
 INTO SmMdLg;

 SELECT p.name, p.deptid
 FROM Professors p
```

```
GROUP BY p.deptid
HAVING COUNT (p.ssn) > 20
INTO G20Profs;

SELECT SmMdLg.deptid
FROM SmMdLg
WHERE (SmMdLg.Small + SmMdLg.Medium) < SmMdLg.Large
INTO G20Depts;

SELECT G20Profs.name
FROM G20Depts, G20Profs
WHERE G20Depts.deptid = G20Profs.deptid;
```

```
10. SELECT c.cid, COUNT (SELECT *
                         FROM Students s, Enrollment e,
                         WHERE s.sid = e.sid and e.grade = 'D' or e.grade = 'F')
                 / COUNT (SELECT *
                         FROM Students s, Enrollment e,
                         where s.sid = e.sid) * 100 AS FailedPercentage
    FROM Enrollment e, Courses c
    GROUP BY c.cid;
```

```
11. SELECT c.cid, COUNT (SELECT *
                         FROM Students s, Enrollment e,
                         WHERE s.sid = e.sid and e.grade = 'D' or e.grade = 'F')
                 / COUNT (SELECT *
                         FROM Students s, Enrollment e,
                         where s.sid = e.sid) * 100 AS FailedPercentage
    FROM Enrollment e, Courses c
    GROUP BY c.cid
    INTO DorFStudents;

    SELECT p.name
    FROM Professors p, Teaches t, DorFStudents
    WHERE p.ssn = t.ssn and t.cid is in
            (SELECT DorFStudents.cid
             FROM DorFStudents
             WHERE MAX (DorFStudents.FailedPercentage)));
```

```
12. SELECT COUNT (SELECT *
                 FROM Enrollment e, Students s
                 WHERE s.sid = e.sid and e.grade = 'D' or e.grade = 'F')
                 / COUNT (SELECT *
                         FROM Enrollment e, Students s
                         WHERE e.sid = sid) * 100 );
```

```
13. SELECT c.cid
     FROM Courses c, Enrollment e
     WHERE c.cid = e.cid and (e.grade = ‘D’ or e.grade = ‘F’)
     GROUP BY c.cid
     HAVING COUNT (e.grade) > COUNT (SELECT AVG (grade) FROM Enrollment);

14. SELECT c.deptid, COUNT (SELECT *
                                   FROM Students s, Enrollment e
                                   WHERE s.sid = e.sid) / COUNT (SELECT e.section FROM
                              enrollment) AS ‘SPS’,

                              COUNT (SELECT *
                                          FROM Students s, Enrollment e,
                                          WHERE s.sid = e.sid and e.grade = ‘A’ )
                              / (SELECT *
                                FROM Students s, Enrollment e
                                WHERE s.sid = e.sid) * 100 AS ‘A%’,

                              COUNT (SELECT *
                                          FROM Students s, Enrollment e,
                                          WHERE s.sid = e.sid and e.grade = ‘B’ )
                              / (SELECT *
                                FROM Students s, Enrollment e
                                WHERE s.sid = e.sid) * 100 AS ‘B%’,

                              COUNT (SELECT *
                                          FROM Students s, Enrollment e,
                                          WHERE s.sid = e.sid and e.grade = ‘C’ )
                              / (SELECT *
                                FROM Students s, Enrollment e
                                WHERE s.sid = e.sid) * 100 AS ‘C%’,

                              COUNT (SELECT *
                                          FROM Students s, Enrollment e,
                                          WHERE s.sid = e.sid and e.grade = ‘D’ )
                              / (SELECT *
                                FROM Students s, Enrollment e
                                WHERE s.sid = e.sid) * 100 AS ‘D%’,

                              COUNT (SELECT *
                                          FROM Students s, Enrollment e,
                                          WHERE s.sid = e.sid and e.grade = ‘F’ )
                              / (SELECT *
                                FROM Students s, Enrollment e
                              WHERE s.sid = e.sid) * 100 AS ‘F%’
```

```
FROM Courses c, Enrollment e
GROUP BY e.section, c.cid;
```