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)

);

1. SELECT name

FROM Professors

WHERE deptid = ‘cs’;

1. SELECT s.sid

FROM Enrollment e, Courses c, Students s

WHERE s.sid = e.sid and e.cid = c.cid and c.deptid = ‘cs’;

1. 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’));

1. SELECT count (cid)

FROM Courses

GROUP BY deptid;

1. SELECT deptid

FROM Courses

GROUP BY deptid

HAVING COUNT (cid) > 10;

1. 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%’;

1. 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;

1. (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;

1. 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;

1. 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)));

1. 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 );

1. 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);

1. 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;