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Lab Section 22

CS166 HW SQL

Problem 1. Exercise 5.2 Queries 6-11:
Suppliers(sid: integer, sname: string, address: string)
Parts(pid: integer, pname: string, color: string)
Catalog(sid: integer, pid: integer, cost: real)
Query 6 For each part, find the sname of the supplier who charges the most for that part:

```
SELECT S.sname
FROM Suppliers S, Parts P, Catalog C
WHERE S.sid = C.sid AND P.pid = C.pid AND C.cost =
( SELECT MAX(C2.cost)
  FROM Catalog C2
  WHERE C2.pid=P.pid);
```

Query 7 Find the sids of suppliers who supply only red parts:

```
SELECT S.sid
FROM Suppliers S, Parts P, Catalog C
WHERE S.sid=C.sid AND P.pid=C.pid AND S.sid IN
( SELECT S.sid
  FROM Suppliers S, Parts P, Catalog C
  WHERE S.sid=C.sid AND P.pid=C.pid AND P.color='Red'
  EXCEPT
  SELECT S.sid
  FROM Suppliers S, Parts P, Catalog C
  WHERE S.sid=C.sid AND P.pid=C.pid AND P.color!='Red')
GROUP BY S.sid;
```

Query 8 Find the sids of suppliers who supply a red part and a green part:

```
SELECT S.sid
FROM Suppliers S, Parts P, Catalog C
WHERE S.sid=C.sid AND P.pid=C.pid AND S.sid IN
( SELECT S.sid
  FROM Suppliers S, Parts P, Catalog C
  WHERE S.sid=C.sid AND P.pid=C.pid AND P.color='Green'
  INTERSECT
  SELECT S.sid
  FROM Suppliers S, Parts P, Catalog C
  WHERE S.sid=C.sid AND P.pid=C.pid AND P.color='Red')
GROUP BY S.sid;
```

Query 9 Find the sids of suppliers who supply a red part or a green part:

```
SELECT S.sid
FROM Suppliers S, Parts P, Catalog C
WHERE S.sid=C.sid AND P.pid=C.pid AND S.sid IN
( SELECT S.sid
  FROM Suppliers S, Parts P, Catalog C
```

```
  WHERE S.sid=C.sid AND P.pid=C.pid AND P.color='Green'
  UNION
  SELECT S.sid
  FROM Suppliers S, Parts P, Catalog C
  WHERE S.sid=C.sid AND P.pid=C.pid AND P.color='Red')
GROUP BY S.sid;
```

Query 10 For every supplier that only supplies green parts, print the name of the supplier and the total number of parts that she supplies:

```
SELECT S.sname, COUNT(*)
FROM Suppliers S, Parts P, Catalog C
WHERE S.sid=C.sid AND P.pid=C.pid AND S.sid IN
( SELECT S.sid
  FROM Suppliers S, Parts P, Catalog C
  WHERE S.sid=C.sid AND P.pid=C.pid AND P.color='Green'
  EXCEPT
  SELECT S.sid
  FROM Suppliers S, Parts P, Catalog C
  WHERE S.sid=C.sid AND P.pid=C.pid AND P.color!='Green'
)
GROUP BY S.sid;
```

Query 11 For every supplier that supplies a green part and a red part, print the name and price of the most expensive part that she supplies:

```
SELECT P.pname, MAX(C.cost)
FROM Suppliers S, Parts P, Catalog C
WHERE S.sid=C.sid AND P.pid=C.pid AND S.sid IN
( SELECT S.sid
  FROM Suppliers S, Parts P, Catalog C
  WHERE S.sid=C.sid AND P.pid=C.pid AND P.color='Green'
  INTERSECT
  SELECT S.sid
  FROM Suppliers S, Parts P, Catalog C
  WHERE S.sid=C.sid AND P.pid=C.pid AND P.color='Red'
)
GROUP BY S.sid;
```

Problem 2 on next page:

Problem 2. Consider the following relational database schema:
STUDENT (Name, StudentNumber, Class, Major)
COURSE (CourseName, CourseNumber, CreditHours, Department)
PREREQUISITE (CourseNumber, PrerequisiteNumber)
SECTION (SectionIdentifier, CourseNumber, Semester, Year, Instructor)
GRADE_REPORT (StudentNumber, SectionIdentifier, Grade)

Write the queries below in SQL:
a. Retrieve the names of all courses taught by professor King in 2005 and 2010.

```
SELECT CourseName
FROM COURSE, SECTION
WHERE COURSE.CourseNumber=SECTION.CourseNumber AND Instructor='King'
AND (Year='2005' OR Year='2010');
```

b. For each section taught by professor King, retrieve the course number, semester, year, and number of students who took the section.

```
SELECT CourseNumber, Semester, Year, COUNT(*)
FROM SECTION, GRADE_REPORT
WHERE SECTION.SectionIdentifier=GRADE_REPORT.SectionIdentifier AND Instructor='King'
GROUP BY CourseNumber, Semester, Year;
```

c. Retrieve the names and major departments of all A students (students who have a grade of A in all their courses).

```
SELECT Name, Major
FROM STUDENT
WHERE NOT EXISTS
( SELECT *
 FROM GRADE_REPORT
 WHERE STUDENT.StudentNumber=GRADE_REPORT.StudentNumber AND Grade!='A');
```

d. Retrieve the names and major departments of all students who do not have a grade of A in any of their courses.

```
SELECT Name, Major
FROM STUDENT
WHERE NOT EXISTS
( SELECT *
 FROM GRADE_REPORT
 WHERE STUDENT.StudentNumber=GRADE_REPORT.StudentNumber AND Grade='A');
```