**Introduction to Applied Data Science**

**Homework 4**

**Provide answers to the following questions as a PDF file or Word document file.**

**Consider the following schema (key fields are underlined):**

**Suppliers( sid: integer, sname: text, address: text)**

**Parts(pid: integer, pname: text, color: text)**

**Catalog( sid: integer, pid: integer, cost: real)**

**The Catalog contains parts supplied by a supplier at a particular cost.**

**NOTE: All of the queries assume that no NULL values exist in the tables.**

**Convert the following English queries into SQL:**

1. **Find the names and addresses of suppliers who supply parts which cost less than $100.**

SELECT s.sname, s.address FROM Suppliers s

INNER JOIN Catalog c ON c.sid = s.sid

WHERE c.cost < 100

1. **Find the names of suppliers who supply parts which are either green or blue.**

SELECT DISTINCT s.sname FROM Suppliers s

INNER JOIN Catalog c ON c.sid = s.sid

INNER JOIN Parts p ON c.pid = p.pid

WHERE p.color IN ('green', 'blue');

1. **Find the names of suppliers who supply both a red part and a green part (at least one of each color)**

SELECT DISTINCT s.sname FROM Suppliers s

WHERE s.sid IN (

SELECT c1.sid

FROM Catalog c1

INNER JOIN Parts p1 ON c1.pid = p1.pid

WHERE p1.color = 'red'

)

AND s.sid IN (

SELECT c2.sid

FROM Catalog c2

INNER JOIN Parts p2 ON c2.pid = p2.pid

WHERE p2.color = 'green'

);

1. **Find the names of suppliers who supply every red and blue part.**

SELECT DISTINCT s.sname FROM Suppliers s

WHERE NOT EXISTS (

SELECT p.pid

FROM Parts p

WHERE p.color IN ('red', 'blue')

AND p.pid NOT IN (

SELECT c.pid FROM Catalog c WHERE c.sid = s.sid

)

);

1. **Find the sids of suppliers who supply every red part or supply every blue part (use nested query)**

SELECT s.sid FROM Suppliers s

WHERE (

NOT EXISTS (

SELECT p.pid FROM Parts p WHERE p.color = 'red'

EXCEPT

SELECT c.pid FROM Catalog c WHERE c.sid = s.sid

)

) OR (

NOT EXISTS (

SELECT p.pid FROM Parts p WHERE p.color = 'blue'

EXCEPT

SELECT c.pid FROM Catalog c WHERE c.sid = s.sid

)

);

1. **Find pairs of suppliers who supply the same part.**

SELECT DISTINCT c1.sid AS supplier1, c2.sid AS supplier2, c1.pid FROM Catalog c1

INNER JOIN Catalog c2 ON c1.pid = c2.pid AND c1.sid < c2.sid;

1. **Find the pids of parts supplied by at least two different suppliers.**

SELECT c.pid FROM Catalog c

GROUP BY c.pid

HAVING COUNT(DISTINCT c.sid) >= 2;

1. **Find the supplier who supplies the most expensive part in the whole catalog.**

SELECT s.sname FROM Suppliers s

INNER JOIN Catalog c ON s.sid = c.sid

WHERE c.cost = (SELECT MAX(cost) FROM Catalog);

1. **Find all suppliers who don’t supply a red part.**

SELECT DISTINCT s.sname FROM Suppliers s

WHERE s.sid NOT IN (

SELECT c.sid

FROM Catalog c

INNER JOIN Parts p ON c.pid = p.pid

WHERE p.color = 'red'

);

1. **Find the count of all parts supplied by ‘Acme Suppliers’ grouped by their color. Do same query but show only when the count is less than 100.**

SELECT p.color, COUNT(\*) AS part\_count FROM Suppliers s

INNER JOIN Catalog c ON s.sid = c.sid

INNER JOIN Parts p ON c.pid = p.pid

WHERE s.sname = 'Acme Suppliers'

GROUP BY p.color;

SELECT p.color, COUNT(\*) AS part\_count FROM Suppliers s

INNER JOIN Catalog c ON s.sid = c.sid

INNER JOIN Parts p ON c.pid = p.pid

WHERE s.sname = 'Acme Suppliers'

GROUP BY p.color

HAVING COUNT(\*) < 100;