Assignment 4 Problem Set

1.(a) UPDATE Ingredients
    SET quantity = 16
    WHERE ingredient = 'butter' AND quantity > 16;
(b) DELETE FROM Ingredients
    WHERE ingredient = 'pork' AND food IN (SELECT food
    FROM Dish
    WHERE cuisine = 'Arab');
(c) INSERT INTO ShoppingList
    SELECT d.cuisine, i.ingredient, SUM(i.quantity)
    FROM Dish d, Ingredient i
    WHERE d.food = i.food
    GROUP BY d.cuisine, i.ingredient;
(d)

2.(a) SELECT *
    FROM Employee E1
    WHERE salary >= ALL (SELECT salary
    FROM Employee E2
    WHERE E2.manager=E1.manager)
    OR salary <= ALL (SELECT salary
    FROM Employee E2
    WHERE E2.manager=E1.manager);
(b) SELECT location, AVG(salary)
    FROM Employee
    GROUP BY location;
(c) SELECT manager
    FROM Employee E1
    GROUP BY manager
    HAVING COUNT(DISTINCT location)>2;
(d) SELECT manager, SUM(salary)
    FROM Employee
    GROUP BY manager;
3. (a) 
SELECT owner 
FROM Cars 
WHERE owner NOT IN (SELECT owner 
    FROM Motorcycle); 

(b) 
SELECT owner, COUNT(*) 
FROM Cars 
GROUP BY owner; 

(c) 
INSERT INTO Ownership 
(SELECT c.owner, COUNT(DISTINCT c.license), COUNT(DISTINCT m.license) 
FROM Cars c, Motorcycle m 
WHERE c.owner=m.owner 
GROUP BY c.owner) 
UNION 
(SELECT c.owner, COUNT(*), 0 
FROM Cars c 
WHERE c.owner NOT IN (SELECT owner FROM Motorcycle) 
GROUP BY c.owner) 
UNION 
(SELECT m.owner, 0, COUNT(*) 
FROM Motorcycle m 
WHERE m.owner NOT IN (SELECT owner FROM Cars) 
GROUP BY m.owner); 

4. (a) 
SELECT course 
FROM Instructors 
WHERE instructor = 'Prof. Smith'; 

(b) 
SELECT instructor, COUNT(*) 
FROM Instructors 
GROUP BY instructor; 

(c) 
SELECT instuctor, COUNT(DISTINCT course) 
FROM Instructors 
GROUP BY instructor; 

5. (a) 
SELECT t.student 
FROM Transcript t, Instuctors i 
WHERE t.course = i.course AND t.quarter = i.quarter 
    AND i.instructor = 'Prof. Smith';
(b) SELECT student FROM Transcript t WHERE NOT EXISTS (SELECT course FROM Instructors WHERE instructor = 'Prof. Smith' AND course NOT IN (SELECT course FROM Transcript WHERE student = t.student));

(c) SELECT student FROM Transcript t1 WHERE NOT EXIST (SELECT course FROM Transcript t2, Instructor i WHERE t2.student = t1.student AND t2.course = i.course AND t2.quarter = i.quarter AND i.instructor <> 'Prof. Smith');

(d) SELECT student FROM Transcript t1 WHERE NOT EXIST (SELECT course FROM Transcript t2, Instructor I WHERE t2.student = t1.student AND t2.course = i.course AND t2.quarter = i.quarter AND i.instructor = 'Prof. Smith');