

DATA 514 Week 3 Worksheet

Lecture 1: Question Prompt

Using a subquery, find the number of cars each person drives

•Hint: your query will be correlated

Payroll

<u>UserID</u>	Name	Job	Salary
123	Leslie	TA	50k
345	Frances	TA	60k
567	Magda	Prof	120k
789	Quinn	Prof	100k

Regist

<u>UserID</u>	Car	Year
123	Charger	2009
567	Civic	2016
567	Ferrari	2000
789	<u>Picklemobile</u>	2018

L2 Question Prompt

Give a proposition for people who do not drive cars, then write a SQL query to return their name and salary

•Hint: you will need to use a different expression than a check for the empty set $\emptyset$

L3 Question Prompt

```
SELECT P.Job, COUNT(*)  
FROM Payroll AS P  
GROUP BY P.Job
```

Is this query Monotone:

- ☐ Yes Monotone
- ☐ Not Monotone

What is a record you could add to demonstrate the above:

L4 Question Prompt

Find the number of each car each person drives (Including Frances Quinn!)

UserID	Name	Job	Salary
123	Leslie	TA	50k
345	Frances	TA	60k
567	Magda	Prof	120k
789	Quinn	Prof	100k

UserID	Car	Year
123	Charger	2009
567	Charger	2016
567	Charger	2000
567	Civic	2018

L5 Question Prompt

Select each Driver in Person who drives all the vehicles in Car:

Driver	Car
Leslie	Camry
Leslie	Civic
Magda	Ferrari
Magda	Camry
Magda	Civic
Frances	Civic
Leslie	Ferrari
Frances	Camry

Car
Camry
Ferrari
Civic

L6 Question Prompt

How many records are returned?

```
SELECT *  
FROM Toys  
WHERE price < 1000  
AND (size=2 OR color='red')
```

Name	Price	Size	Color
iPad Pro	\$1099	12	gray
Bicycle	NULL	NULL	red
Freeze Tag	\$0	NULL	NULL
iPad Air	\$599	10	NULL

Section Challenges:

These tables will be used throughout this worksheet

```
CREATE TABLE Class (  
dept VARCHAR(50),  
number INT,  
title VARCHAR(50),  
PRIMARY KEY (dept, number));
```

```
CREATE TABLE Instructor (  
username VARCHAR(50) PRIMARY KEY,  
fname VARCHAR(50),  
lname VARCHAR(50),  
started_on CHAR(10));
```

```
CREATE TABLE Teaches(  
username VARCHAR(50), -- can use the REFERENCES syntax here  
dept VARCHAR(50),  
number INT,  
PRIMARY KEY (username, dept, number),  
FOREIGN KEY (username) REFERENCES Instructor,  
FOREIGN KEY (dept, number) REFERENCES Class);
```

Question 1

Write an SQL query that will return the first and last name of all instructors who are teaching at least one class.

Question 2

For each instructor, write an SQL query that will return their username and the number of classes they teach.

Question 3

Unnest the following SQL query so it does not use subqueries:

```
SELECT I.username,  
       ( SELECT COUNT(*)  
         FROM Teaches AS T  
        WHERE T.username = I.username  
       )  
FROM Instructor AS I;
```

Question 4

Unnest the following SQL query so it does not use subqueries:

```
SELECT C1.dept, C1.number FROM Class AS C1
WHERE C1.number >= ALL (
    SELECT C2.number FROM Class AS C2
    WHERE C1.dept = C2.dept
);
```

Question 5

Write an SQL query that will return the number of instructors who are teaching at least one class. (1 row)

Question 6

Write an SQL query that will return the first and last name of the newest instructor(s) (who started on the latest date). Assume Instructor.started_on uses yyyy-mm-dd format. If there are multiple instructors, list all of them.

Question 7

Write an SQL query that will return the username, first name, and last name of the instructors who teach the most number of classes. If there are multiple instructors, list all of them.

Question 8

Write an SQL query that will answer the question, which CSE courses do neither Dr. Levy (username 'levy') nor Dr. Wetherall (username 'djw') teach? Give the department, number, and title of these courses.