University of Toronto
CSC343, Winter 2017

SQL: Outer Joins etc.

Schema

Student(<u>sID</u>, surName, firstName, campus, email, cgpa)

Course(<u>dept, cNum</u>, name, breadth)

Offering(<u>oID</u>, dept, cNum, term, instructor)

Took(<u>sID, oID</u>, grade)

Offering[dept, cNum] $\subseteq$ Course[dept, cNum]

Took[sID] $\subseteq$ Student[sID]

Took[oID] $\subseteq$ Offering[oID]

Questions

1. Which of these queries is legal?

   (a)
   ```
   SELECT count(distinct dept), count(distinct instructor)
   FROM Offering
   WHERE term >= 20089;
   ```

   (b)
   ```
   SELECT distinct dept, distinct instructor
   FROM Offering
   WHERE term >= 20089;
   ```

   (c)
   ```
   SELECT distinct dept, instructor
   FROM Offering
   WHERE term >= 20089;
   ```

2. Under what conditions could these two queries give different results? If that is not possible, explain why.

   ```
   SELECT surName, campus
   FROM Student;
   ```

   ```
   SELECT distinct surName, campus
   FROM Student;
   ```

3. For each student who has taken a course, report their sid and the number of different departments they have taken a course in.

4. Suppose we have two tables with content as follows:

```
SELECT *
FROM One;

 a  |  b
----+-----
  1 |   2
  6 |  12
    | 100
 20 |
(4 rows)
```

```
SELECT *
FROM Two;

  b  |  c
-----+-----
   2 |   3
 100 | 101
  20 |  21
   2 |   4
   2 |   5
(5 rows)
```

(a) What query could produce this result?

```
 a |  b  |  c
---+-----+-----
 1 |   2 |   3
 1 |   2 |   4
 1 |   2 |   5
   |  20 |  21
   | 100 | 101
(5 rows)
```

(b) What query could produce this result?

```
 a  |  b  |  c
----+-----+-----
  1 |   2 |   3
  1 |   2 |   4
  1 |   2 |   5
  6 |  12 |
    | 100 | 101
 20 |     |
(6 rows)
```