

Lab: Natural joins - review

Make a serious effort to answer all questions from memory before referring to lecture slides or other resources.

In this lab we will mostly repeat problems from the last lab, but this time using natural joins. **Do not refer to your answers on the last lab!**

1. Read the 'courses-ddl.sql' and 'courses-small.sql' files into SQLite. (Files available on iLearn just below this lab.)
2. Write SQL to answer the following questions:

- a. For every course taken by a student, show the student's ID, name, and course taken. (Hint, use tables 'student' and 'takes'.)

```
select student.ID, name, course_id
  from student natural join takes;
```

- b. For every course taught by an instructor, show the instructor's name and the course that is taught.

```
select name, course_id
  from instructor natural join teaches;
```

- c. In this question we look at a problem that can arise with natural joins. Write a SQL query that gives the dept_name, budget, course_id, title, semester, and year of all the sections offered by the "Physics" department.

Write the query first with a simple join, then using a natural join. Did you get the same results in each query? If not, figure out and explain why.

```
select course.dept_name, course.course_id, title, semester, year,
       budget from department, section, course
  where section.course_id = course.course_id
        and course.dept_name = department.dept_name
        and department.dept_name = "Physics";
```

```
select dept_name, course_id, title, semester, year, budget
  from department natural join section natural join course
  where dept_name = "Physics";
```

The results are different because the department and section tables both have 'building' fields. A natural join will automatically force a match on the building

fields, which we don't want. To achieve the desired query with a natural join, you can do this:

```
select dept_name, course_id, title, semester, year, budget
  from (select dept_name, course_id, title, budget
        from department natural join course)
      natural join section
 where dept_name = "Physics";
```