Lab 2: SQL

Objectives

-To practice using SQLite3
-To practice using SQL

The Task

You will create a University enterprise system in SQLite3 and run queries on that University database

The Steps

1. If you have not already done so, logon to Blackboard and go to Course Materials/Lectures/Lecture D01 and download the UMBC.db database
2. Create and execute the following queries
    a. Simple Queries
        i. sql: List in alphabetic order the titles of all courses
```
select distinct title
from course
order by title
```
        ii. sql: Find all course_ids taken in the Spring 2010 semester
```
Select distinct course_id
from takes
where year = 2010 and semester = 'Spring'
```
        iii. sql: Find courses that ran in Fall 2009 or in Spring 2010
```
select course_id from section where semester = 'Fall' and year = 2009
 union
select course_id from section where semester = 'Spring' and year = 2010
```
        iv. sql: Find instructors in the Biology or History departments
```
select name
from instructor
where dept_name = 'Biology'
or dept_name = 'History'
```
        v. find all instructors in Comp. Sci. dept with salary > 80000
```
select *
from instructor
where dept_name = 'Comp. Sci.'
and salary > 80000;
```
    b. Join Queries
        i. sql: Find the course_id, sec_id, semester, building, day, start_hr and start_min for all courses that ran in 2010.
```
select course_id, sec_id, semester, building, day, start_hr, start_min, year
from section s, time_slot t
where s.time_slot_id = t.time_slot_id
and year = 2010
order by course_id, sec_id
```
        ii. sql: List the course-id, building, room number and room capacity assigned to a course for all sections that ran in 2010. Note that schema abbreviated room_number to room_no. Use room_number
```
select course_id, s.building, s.room_number, capacity
from section s, classroom c
```

```
where s.building = c.building
and s.room_number = c.room_number
and year = 2010
```

iii. sql: Find the names of all advisors for students in the Comp. Sci. department

```
Select i.name
from instructor i, student s, advisor a
where i.ID = a.i_id
and s.ID = a.s_id
and s.dept_name = 'Comp. Sci.'
```

iv. Find the names of all students who have taken at least one Comp. Sci. course; make sure there are no duplicate names in the result.

```
select distinct name
from student, takes, course
where course.dept_name = 'Comp. Sci.'
and student.id = takes.id
and takes.course_id = course.course_id;
```

v. For all instructors in the university who have taught some course, find their names and the course titles they have taught

```
select name, title, semester, year
from instructor, teaches, course
where instructor.id = teaches.id
and teaches.course_id = course.course_id
```

vi. List the names of instructors along with the course ID of the courses that they taught.

```
select name, course_id
from instructor, teaches
where instructor.ID = teaches.ID;
```

c. Groups and Aggregates

i. sql: Find the average salary of instructors in the Biology department

```
select avg (salary)
from instructor
where dept_name= 'Biology'
```

ii. sql: Find the total room capacity for each building

```
select building, sum(capacity)
from classroom
group by building
```

iii. sql: Find the names and average salaries of all departments whose max salary is greater than 95000

```
select dept_name, avg (salary)
from instructor
group by dept_name
having max (salary) >= 80000;
```