CS4400: Database Systems
Homework 1
SQLite
Due January 25, 2017, 11:59pm

Instructions: Upload your submission on ICON under Assignments > Homework 1.

The SQL statements in questions 1 and 2 must be in a single plain text file named hw1.sql. It must run successfully when you type the following command:

db3 –init hw1.sql (or the equivalent command on your system)

Goals for this assignment

- Be able to create and manipulate tables in sqlite3
- Be able to write select-from-where queries
- Do some basic data modeling

Before you start, make sure you can run sqlite3. See the Resources page.

Additional resources

- Important sqlite commands (note the leading period)
  o .help
  o to view your tables: .tables
  o .exit
- common command line functions
- formatting output
- more detailed information about commands

1. [5 points] Do the following steps:
   a. Write SQL statements to create a table called that can store any directed graph (“graph” as in vertices and edges, or nodes and links). You pick the schema.
   b. Write SQL statements to store the following graph in your table.
c. Write a SQL statement that returns all source vertices.
d. Write a SQL statement that returns all edges, such that the source id is larger than the destination id

For the next question you will be asked to create tables with attributes of types integer, varchar, date, and Boolean. However, SQL Lite does not have date and Boolean: you will use varchar and int instead:

- 0 (false) and 1 (true) are the values used to interpret Booleans.
- Date strings in SQLite are in the form: 'YYYY-MM-DD'.
  - Examples of valid date strings include: '1988-01-15', '0000-12-31', and '2011-03-28'.
  - Examples of invalid date strings include: '11-11-01', '1900-1-20', '2011-03-5', and '2011-03-50'.
  - Examples of date operations on date strings (try them):
    select date('2011-03-28');
    select date('now');
    select date('now', '-5 year');
    select date('now', '-5 year', '+24 hour');
    select case when date('now') < date('2011-12-09') then 'Taking classes' when date('now') < date('2011-12-16') then 'Exams' else 'Vacation' end;

2. [5 points]
   You’ll do some data modeling and querying.

   a. Pick some realistic situation or data that interests you and model it with the relational data model. Create your tables in SQLite. The only requirements are
      - You cannot use an example from class
      - The data to be modeled must require at least 2 tables
      - you must have at least one foreign key relationship
      - you must have at least one primary key
      - at least one attribute must be a boolean (see above)
• at least one attribute must be a date (see above)

b. insert a total of at least 6 tuples into your tables
c. run a SQL command that violates a foreign key constraint
d. Write an interesting query (not just “return all tuples”) and output the results to a csv file (see the various help docs and resources)

Acknowledgements
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