

CS200 Assignment 8 – SQL

Due Monday July 13, 2020, 11:59 pm

RemindersReadings and Resources

On Learn: Database Resources > Database Design
SQL Tutorial

Files

The following are located on Learn in Week 8 > Assignment Files:

ForAssign8.docx:	Download this file and put your answers for question 1 here.
university.sqlite:	Download this file and follow the steps in question 1.
SampleDB_Diagram.pdf:	This shows a diagram of the tables used in question 1 and will be helpful when doing question 1.

Assignment Objectives

- To gain an understanding of a command line Database Management System.
 - To see the “backend” of a GUI Database Management System.
 - To gain a stronger understanding of database design and the importance of proper database structure.
 - To fully understand what relational databases mean.
-

Assignment Strategy

You may work on question 1 with a partner. If you do, be certain that you both understand all of what you have done. The purpose of allowing you to work in groups is to enable you to help each other understand the assignment, not to enable you to divide up the work. If you work with a partner, label your answer to question 1 username1_username2_A8Q1.docx.

Assignment Setup

Please follow these instructions very carefully to find the files and programs you need.

Mac Instructions

1. Download university.sqlite from Week 8 > Assignment Files on Learn.
2. Move this file to your Documents folder.
3. Open Terminal.
4. Type sqlite3 and drag the university.sqlite file from your Documents folder onto your terminal window. The command will look similar to this:
5. `sqlite3 /Users/bmzister/Documents/university.sqlite`
6. You are now ready to start typing in SQL queries.

Windows Instructions

1. Go to <https://www.sqlite.org/download.html> and download the version under "Precompiled Binaries for Windows" labeled sqlite-tools-win32-x86-3320300.zip.
2. Unzip and run sqlite3.exe.
3. Once sqlite3.exe is open, type .open, add a space then drag and drop university.sqlite onto sqlite.exe. Before hitting enter, change the \s in the path to university.sqlite to /s.
4. You will then be ready to enter queries.

Some notes for creating your SQL queries:

- To ensure that you have connected, type .tables and see a list of tables you've connected
- You may type each part of a query on a separate line (Select, From, Where, Order by, Group by).
- Once you have a complete command, use a ; (semi-colon) to signify that you have completed your command and you will see the results of your query.
- To see the names of the columns (fields) type .header on

Your Tasks

1. Download ForAssign8.docx from Week 8 > Assignment Files on Learn. Rename it to username_A8Q1.docx or username1_username2_A8Q1.docx if you are working with a partner. Using MS Word, insert your input and/or output after each sub-question.

Please format your answers with the styles AnswerTop, Answer, AnswerBot, and SQL_Output (for tabular SQL output, where requested), which are already in ForAssign8.docx. Approximately 7% of the marks for this question are reserved for proper formatting of your answer within ForAssign8.docx.

[75%] In InteractiveSQL create the appropriate statements to answer the queries below:

- a) What SQL statement would you use to **list the courses** known to the database?
- b) What SQL statement would you use to **list the student numbers** of people taking Biology? Note that the courses are stored with their course codes, ex. BIOL
- c) What SQL statement would you use to **list the student numbers and names** of students taking Biology, **ordered by surname**?
- d) What SQL statement would you use to **count the number** of students taking Biology? And what is the answer?
- e) What SQL statement would you use to **list the assignment descriptions (and exams)** for Biology? Please include the output, formatted as a table.
- f) What SQL statement would you use to **list the student number, course code, assignment number, assignment description, assignment weight, and mark** for all the **philosophy marks** for the **student with ID 86088**? Please include the output, formatted as a table.
- g) What SQL statement would you use to compute **the final course grade in philosophy** for the **student with ID 86088**? And what is the answer?
- h) What SQL statement would you use to **list the final course grades for students in Philosophy**? Please include the first ten lines of the answer, formatted as a table.
- i) What SQL statement would you use to **compute the final course grade in philosophy, for students who also took Biology**? Please include the output, formatted as a table.

Bonus (5 marks)

- j) What SQL statement would you use to determine if there is more than one student with the same last name in the database? List the people, name, student number and initials in alphabetical order (by initials) only once.

2. [25%] Consider the Albums database we discussed in lecture, as shown to the right. Suppose we wish to keep track of the artists who appear on the albums in our collection, and record biographical information about them. Clearly we need an Artists table like the one shown below the Albums Table.

Albums
Album ID
Album Title
Recording Group
Medium
Category
Price
Purchase Date
Year Recorded
Recording Label
Artists
Artist ID
First Name
Last Name
Gender
Birth Date
Comments

- a) Explain why these two tables cannot be joined as they are and explain how a third table, with exactly two fields, could record which albums each artist appears on. You should provide a diagram of this table based on the fields of the Album and Artists tables shown here, and you should provide information about its primary and foreign keys. Your answer should also include an explanation of how each of the following problems are solved:
 - i. one artist is likely to contribute to many albums
 - ii. one album is likely to have many artists on it
 - iii. in neither case do you know *how many* (that is, we don't know how many artists have contributed to each album, and we don't know how many albums each artist has)
- b) Given your answer to (a), supply an SQL statement that would list the artists appearing on the album (or albums!) named 'Fare Thee Well Love'.
- c) Given your answer to (a), supply an SQL statement that would list the Album Title of the albums to which an artist named Jimmy Rankin has contributed.

Submission Instructions

- Create a folder named username_Assign8 containing username_A8Q1.docx (or username1_username2_A8Q1.docx) and username_A8Q2.docx.
- Compress the folder, name it username_Assign8.zip, and submit it to the **Assignment 8 DropBox** on **Learn**.