

Lab 04 - We're Gonna Make You SQL

Due Feb 18 at 11:59pm

Points 40

Questions 12

Available after Feb 17 at 9am

Time Limit None

Allowed Attempts Unlimited

Instructions

In this lab we will focus on the DDL and DML capabilities of MySQL's dialect of the SQL declarative programming language. You will gain familiarity with:

1. Modeling databases through the creation of custom schema
2. Constructing basic queries including functions, constraints, sub-queries and grouping.

[Take the Quiz Again](#)

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	2,213 minutes	40 out of 40

🚫 Correct answers are hidden.

Score for this attempt: **40** out of 40

Submitted Feb 18 at 9:53pm

This attempt took 2,213 minutes.

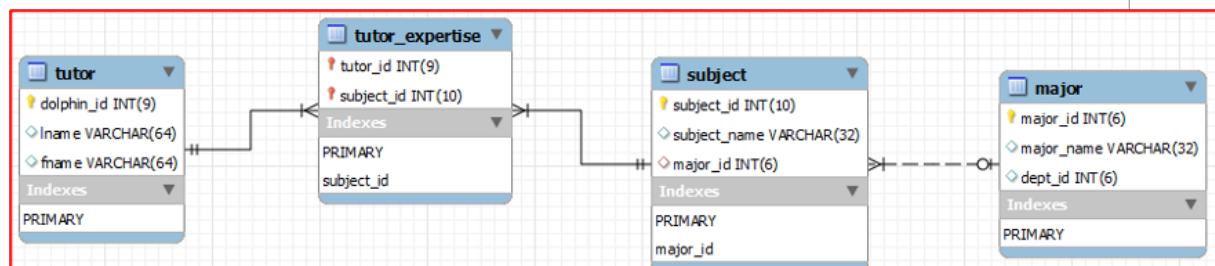
Part 1: Schemin'

In this section you will construct new databases modeled on the ERDs (including some from lab 2). For each problem, please upload a reverse engineered diagram from MySQL workbench below each answer and paste your SQL code to the lab submission.

Example problem:

CI Toots is a new database that tracks undergraduate academic tutors across all majors. Only valid CI students may tutor and a tutor may tutor multiple subjects. A single major may list multiple subjects available for tutoring. Reconstruct the database in MySQL and reverse engineer the database as shown below.

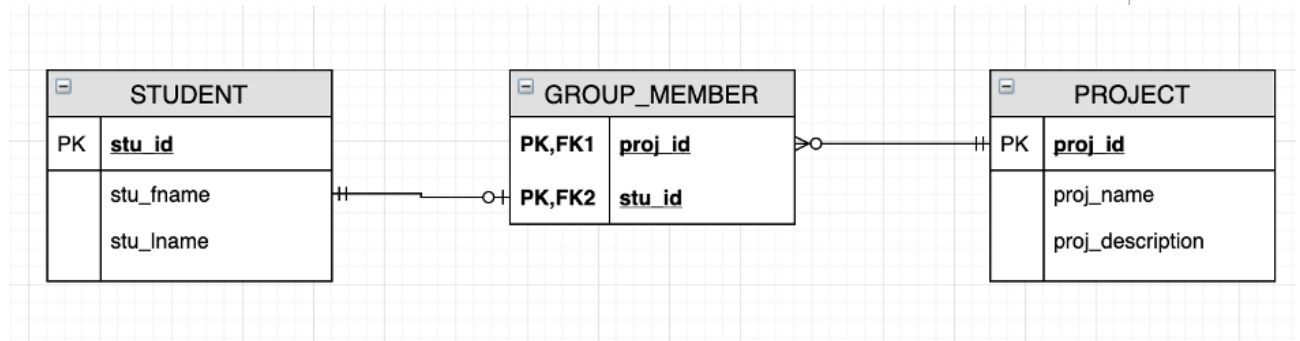
Also, note that the example ERDs do not show strong / weak relationships but your reverse engineered diagrams will.



Question 1

3 / 3 pts

CI420 is a new database set up to track COMP/IT 420 database projects. Please reimplement it as a MySQL database based on the following ERD. Be sure to include proper datatypes and key constraints.



Please upload a picture of your reverse engineered database.

↓ [CI420ERD.png \(https://cilearn.csuci.edu/files/2631318/download\)](https://cilearn.csuci.edu/files/2631318/download)

Question 2

2 / 2 pts

Please paste your SQL code from the previous question (CI420 database) here.

Your Answer:

```

CREATE DATABASE ci420;

use ci420;

CREATE TABLE student
(
  stu_id int(9) NOT NULL AUTO_INCREMENT PRIMARY KEY,
  stu_f_name VARCHAR(50) NOT NULL,
  stu_lname VARCHAR (50) NOT NULL
);

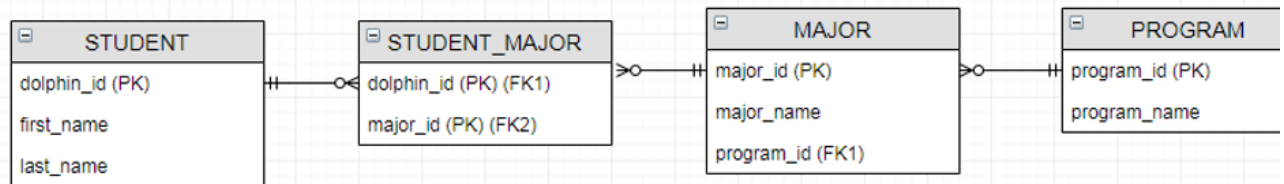
CREATE TABLE project
(
  proj_id int(9) NOT NULL AUTO_INCREMENT,
  proj_name VARCHAR(36),
  proj_description VARCHAR(100),
  PRIMARY KEY(proj_id)
);

CREATE TABLE group_member
(
  proj_id int(9),
  stu_id int(9),
  PRIMARY KEY(proj_id, stu_id),
  FOREIGN KEY (proj_id) REFERENCES project(proj_id),
  FOREIGN KEY(stu_id) REFERENCES student(stu_id)
);
  
```

Question 3

3 / 3 pts

CIMajors is a database that tracks students and their majors. Please re-implement it as a MySQL database based on the following ERD. Be sure to include proper datatypes and key constraints.



Please upload a picture of your reverse engineered database.

[ClimajorsERD.png \(https://cilearn.csuci.edu/files/2631338/download\)](https://cilearn.csuci.edu/files/2631338/download)

Question 4

2 / 2 pts

Please paste your SQL code from the previous question (CIMajors database) here.

Your Answer:

```

CREATE DATABASE cimajors;

use cimajors;

CREATE TABLE student
(
    dolphin_id int(9) NOT NULL AUTO_INCREMENT PRIMARY KEY,
    first_name VARCHAR(50) NOT NULL,
    last_name VARCHAR (50) NOT NULL
);

CREATE TABLE program
(
    program_id int(9) NOT NULL AUTO_INCREMENT,
    program_name VARCHAR(36),
    PRIMARY KEY(program_id)
);

CREATE TABLE major
(
    major_id int(9) NOT NULL AUTO_INCREMENT,
    major_name VARCHAR(36),
    program_id int(9),
    PRIMARY KEY(major_id),
    FOREIGN KEY(program_id) REFERENCES program(program_id)
);

CREATE TABLE student_major
(
    dolphin_id int(9),
    major_id int(9),
    PRIMARY KEY(dolphin_id, major_id),
    FOREIGN KEY (dolphin_id) REFERENCES student(dolphin_id),

```

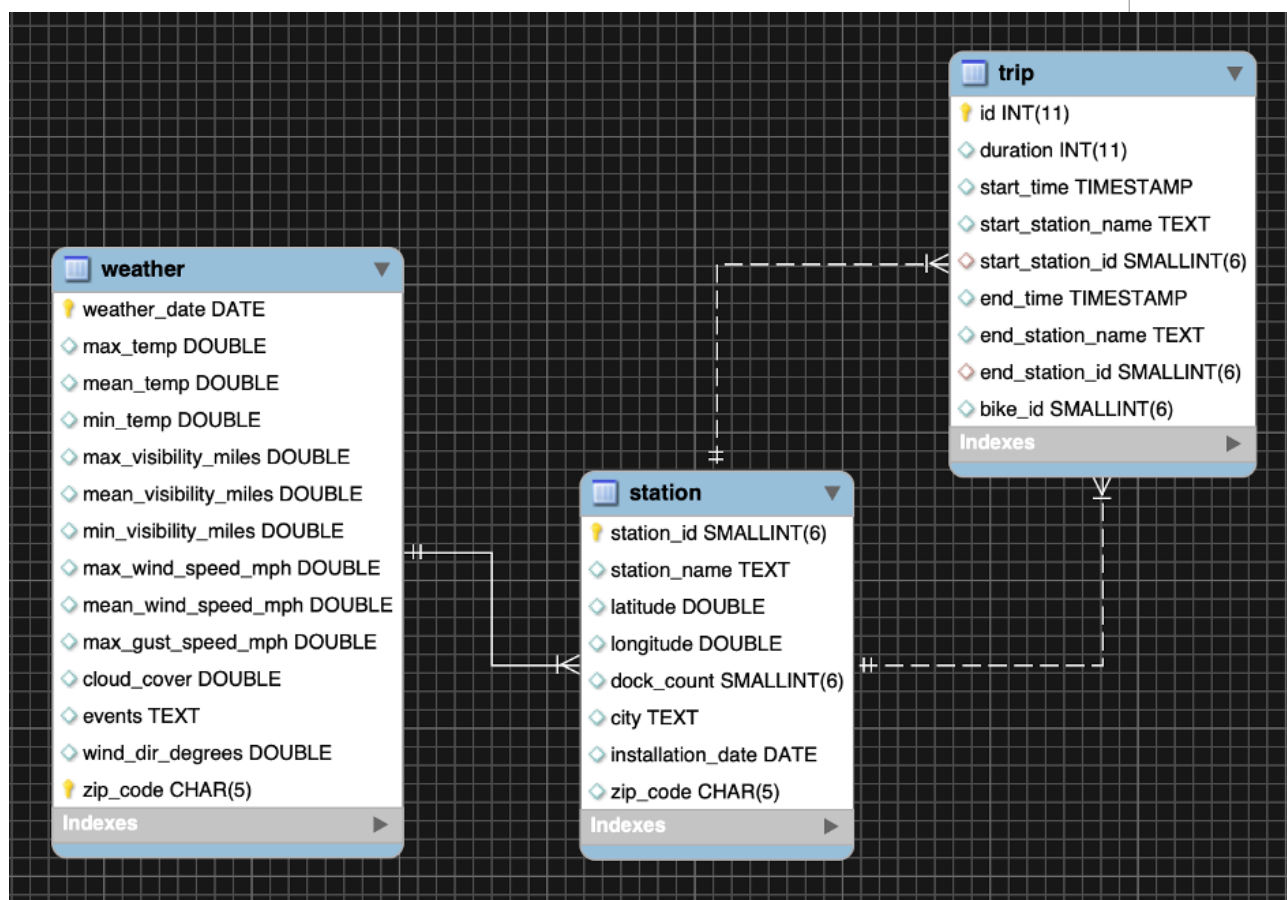
```
FOREIGN KEY(major_id) REFERENCES major(major_id)
);
```

Part 2: A Bike Has Two SQLs

In this section, we will be looking at actual data pulled from a bike sharing application in Northern California. This data set is much larger than the SaleCo data set and you will need to use a different method to import it into MySQL.

The database contains three tables:

1. "stations" that list different bike sharing station locations
2. "trips" that describe individual bike trips between stations
3. "weather" that describes the weather in zip codes that have stations, note that weather has a composite primary key of zip code and date



Looking at the table attributes we can summarize the following tuples (records).

For the weather tuple:

```
('2013-08-29', '74', '68', '61', '10', '10', '10', '23', '11', '28', '4', NULL, '286', '94107')
```

On August 29th 2013, in zip code "94107", the max temperature was 74 degrees F, the mean temperature was 68 degrees F, the minimum temperature was 61 degrees F, the max, mean, and minimum visibility were all 10 miles, the max wind speed was 23 mph, the mean wind speed was 11 mph, and the minimum wind speed was 4 mph. There was a cloud cover of 4, no weather events, and winds in the direction of 286 degrees.

For the station tuple:

```
('2', 'San Jose Diridon Caltrain Station', '37.3297', '-121.902', '27', 'San Jose', '2013-08-06', '95113')
```

Station number two located at "San Jose Diridon Caltrain Station" in "San Jose" in zip code "95113" with latitude 37.3297 and longitude 121.902 has 27 docks and was installed on August 6th, 2013.

For the trip tuple:

```
('4069', '174', '2013-08-29 09:08:00', '2nd at South Park', '64', '2013-08-29 09:11:00', '2nd at South Park', '64', '288')
```

Bike number 288 took trip number 4069 starting on August 29th, 2013 at 9:08am from station 64 '2nd at South Park' and ending on August 29th, 2013 at 9:11am at station 64 "2nd at South Park".

Ignore the 'duration' attribute of '174', 'duration' is inconsistent in this data set and will not be used.

Note the foreign key relationships:

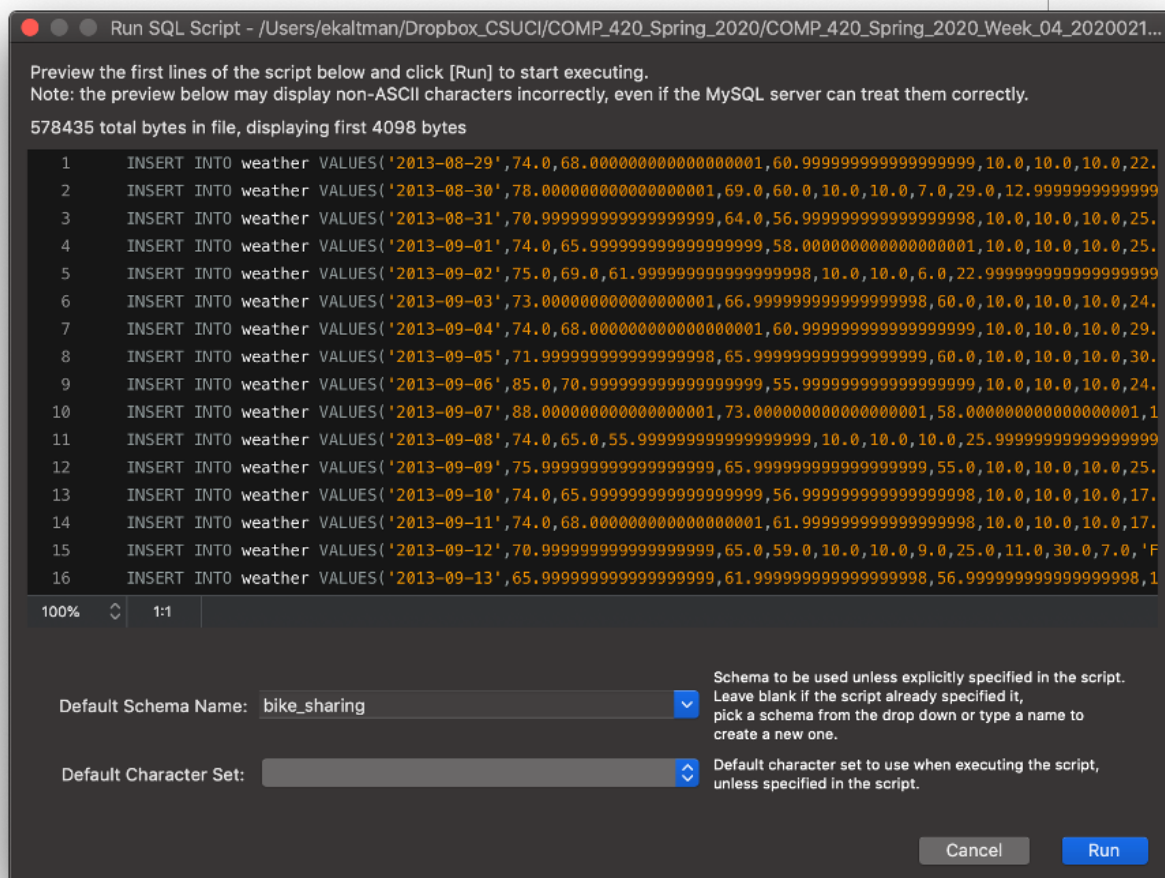
1. trip.start_station_id references station.station_id
2. trip.end_station_id references station.station_id
3. trip.zip_code references weather.zip_code

There are four files uploaded to Canvas:

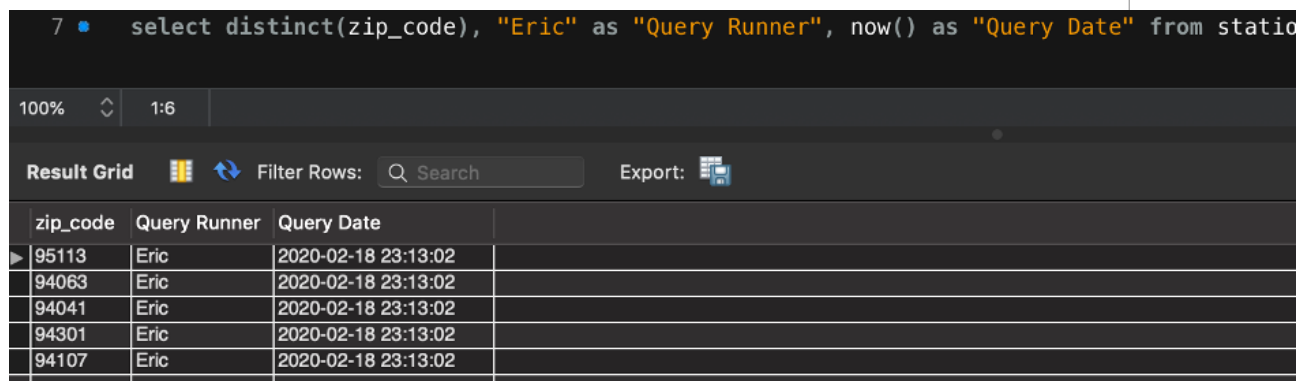
1. COMP_420_Spring_2021_bike_sharing_tables.sql (tables)
2. COMP_420_Spring_2021_bike_sharing_stations.sql (stations)
3. COMP_420_Spring_2021_bike_sharing_trips.sql (trips)
4. COMP_420_Spring_2021_bike_sharing_waether.sql (weather)

You can run the "tables" SQL file by loading it directly into the MySQL Query window. However, the other three files are too large to import directly.

For stations, trips, and weather, you will need to run them as separate scripts. This option is available under the "File -> Run SQL Script..." command. Choose a file to run as a SQL script and be sure to select the "bike_sharing" default schema option.



When submitting a query or result, please submit a picture of the query along with the result set and your credentials. Example:



In some instances, your result set might not fit on screen. Please limit results to 20 entries.

Also, this data may have errors that result is answers that are factually incorrect but true in the database.

Question 5

5 / 5 pts

How many distinct bikes are there in the database?

Please upload a picture of your query and its result.

↓ [Lab04#5.JPG \(https://cilearn.csuci.edu/files/2628227/download\)](https://cilearn.csuci.edu/files/2628227/download)

Question 6

5 / 5 pts

How many trips did bike number 117 take in December 2013?

(Note: To count a trip must have started AND ended within the month of December. Also remember that some trips might be missing start or end times, ignore those results.)

Please upload a picture of your query and its result.

↓ [Lab04#6.JPG \(https://cilearn.csuci.edu/files/2628228/download\)](https://cilearn.csuci.edu/files/2628228/download)

Question 7

5 / 5 pts

Produce a listing of each city name and the number of stations in that city. The list should be sorted by the number of stations and then the city name alphabetically.

Please upload a picture of your query and its result.

↓ [Lab04#7.JPG \(https://cilearn.csuci.edu/files/2628229/download\)](https://cilearn.csuci.edu/files/2628229/download)

Question 8

5 / 5 pts

What is the name of the station that was the destination for the least bike trips?

Please upload a picture of your query and its result.

↓ [Lab04#8.JPG \(https://cilearn.csuci.edu/files/2628230/download\)](https://cilearn.csuci.edu/files/2628230/download)

Question 9

5 / 5 pts

How many stations are in the zip codes that share the highest mean temperature?

Please upload a picture of your query and its result.

↓ [Lab04#9Correct.jpg \(https://cilearn.csuci.edu/files/2631281/download\)](https://cilearn.csuci.edu/files/2631281/download)

Question 10

5 / 5 pts

Produce a descending listing of the average trip time for each bike number.

(Note: Only consider complete trips that have a start_time and an end_time.)

Please upload a picture of your query and its result.

↓ [Lab04#10turnin.JPG \(https://cilearn.csuci.edu/files/2634445/download\)](https://cilearn.csuci.edu/files/2634445/download)

Unanswered

Question 11

0 / 0 pts

Extra Credit Question (4pts):

What is the average number of trips on days that were rainy.

(Note: The weather.events field in the weather table will list "Rain" for rainy days. Any day counts as rainy if at least one zip code encountered rain on that day. Be sure to remove duplicated days if it was rainy in more than one zip code on a given day. A trip counts for a day only if it started on that day in a zip code that was rainy.)

Please upload a picture of your query and its result.

Unanswered

Question 12

0 / 0 pts

Extra Credit Question (4pts):

Which bike number traveled the farthest total distance in the database?

(Note: To calculate this you can use the linear distance:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

between start_station and end_station. Therefore, if a bike started and ended in the same place, it went nowhere for this calculation.

You may also look into MySQL geo-coordinates.)

Please upload a picture of your query and its result.

Quiz Score: **40** out of 40