This is CS50.
cs50.brianyu.me
Week 7

• SQL
  • CREATE TABLE
  • INSERT
  • SELECT
  • UPDATE
  • DELETE
  • Indexes
  • SQL Injection
  • Race Conditions
What questions do you have?
Today

SQL

SQL and Python Lab
Part One

SQL
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<th>id</th>
<th>title</th>
<th>author</th>
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CREATE TABLE books (  
id INTEGER,  
title TEXT,  
author TEXT,  
year NUMERIC,  
PRIMARY KEY(id)  
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<tr>
<th>book_id</th>
<th>rating</th>
<th>votes</th>
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CREATE TABLE ratings (  
    book_id INTEGER,  
    rating REAL,  
    votes INTEGER,  
    FOREIGN KEY(book_id) REFERENCES books(id)  
);
INSERT INTO books
(title, author, year)
VALUES ("Emma", "Jane Autsen", 1815);
SELECT * FROM books
WHERE author = "J.K. Rowling";
UPDATE ratings
SET rating = 4.2
WHERE book_id = 28;
DELETE FROM books
WHERE title = "Fahrenheit 451";
Multiple Tables
Students

- People
- Classes
- Who are the instructors of each class?
- Who are the students in each class?
CREATE TABLE people (  
id INTEGER,  
name TEXT NOT NULL,  
PRIMARY KEY(id)  
);
CREATE TABLE courses (  
id INTEGER,  
code TEXT NOT NULL,  
title TEXT NOT NULL,  
PRIMARY KEY(id)  
);
CREATE TABLE students (  person_id INTEGER NOT NULL,  course_id INTEGER NOT NULL,  FOREIGN KEY(person_id) REFERENCES people(id),  FOREIGN KEY(course_id) REFERENCES courses(id) );
CREATE TABLE instructors (  
    person_id INTEGER NOT NULL,  
    course_id INTEGER NOT NULL,  
    FOREIGN KEY(person_id) REFERENCES people(id),  
    FOREIGN KEY(course_id) REFERENCES courses(id) 
);
wget https://cs50.brianyu.me/students.db
Exercise

Write a SQL query to answer the following question:

What is Alice’s student id?
Exercise

Write a SQL query to answer the following question:

What is the course title for CS51?
Exercise

Write a SQL query to answer the following question:

What are the course codes and titles for all of the CS courses? Assume that all CS courses have a course code that begins with ‘CS’.
Exercise

Write a SQL query to answer the following question:

How many courses are there?
Exercise

Write a SQL query to answer the following question:

How many students are taking CS50?
Exercise

Write a SQL query to answer the following question:

What are the names of all of the instructors? Generate a table with all instructors’ names and the course they teach.
Exercise

Write a SQL query to answer the following question:

What are the names of all of the students taking CS50?
PART TWO

SQL and Python
from cs50 import SQL
Exercise

Write a program to enroll a student in a course.
Race Conditions
SQL Injection
Username:

Password:
SELECT * FROM users
WHERE username = username AND password = password;
Username: harry

Password: 12345
SELECT * FROM users
WHERE username = username AND password = password;
SELECT * FROM users
WHERE username = "harry" AND password = "12345";
Username: hacker
Password: 
SELECT * FROM users
WHERE username = "username" AND password = "password";
SELECT * FROM users
WHERE username = "hacker" --" AND password = "";
SELECT * FROM users
WHERE username = "hacker" --" AND password = "";
PART THREE
Lab
Problem Set 7
Problem Set 7

- Movies
- Fiftyville
This is CS50.