CSCI 330 Database Systems
Homework 2 (Basic SQL)
Total Points: 16 (4% of course grade)

Goals

The goals of this homework are as follows:

- To become familiar with basic SQL commands in MySQL.
  - To create a database
  - To insert data into tables
  - To write basic SQL queries

- The SQL commands from chapter 3 will be sufficient for this homework.

- We will use a software called "**MySQL Workbench**" to write the SQL query in our class. We recommend installing **MySQL workbench** on your computer. There are numerous online tutorials and YouTube videos available to learn how to install and use MySQL workbench. Some examples:
  - https://www.youtube.com/watch?v=OM4aZJW_Ojs&ab_channel=WebDevSimplified (For Windows)
  - https://www.youtube.com/watch?v=-BDbOOY9jsc&ab_channel=AmitThinks (For Mac)
  - https://www.youtube.com/watch?v=iLRY-NfXXsA&ab_channel=AmitThinks (for Ubuntu)

- If you prefer not to install MySQL workbench on your computer, you may use a freely available online editor. Some examples:
  - https://paiza.io/en/languages/mysql
  - https://extendsclass.com/mysql-online.html

What to do

1. ***Create a University Database:*** Use the SQL script (***create_university.sql***), which is available on canvas, to create the following university database (see figure 1).

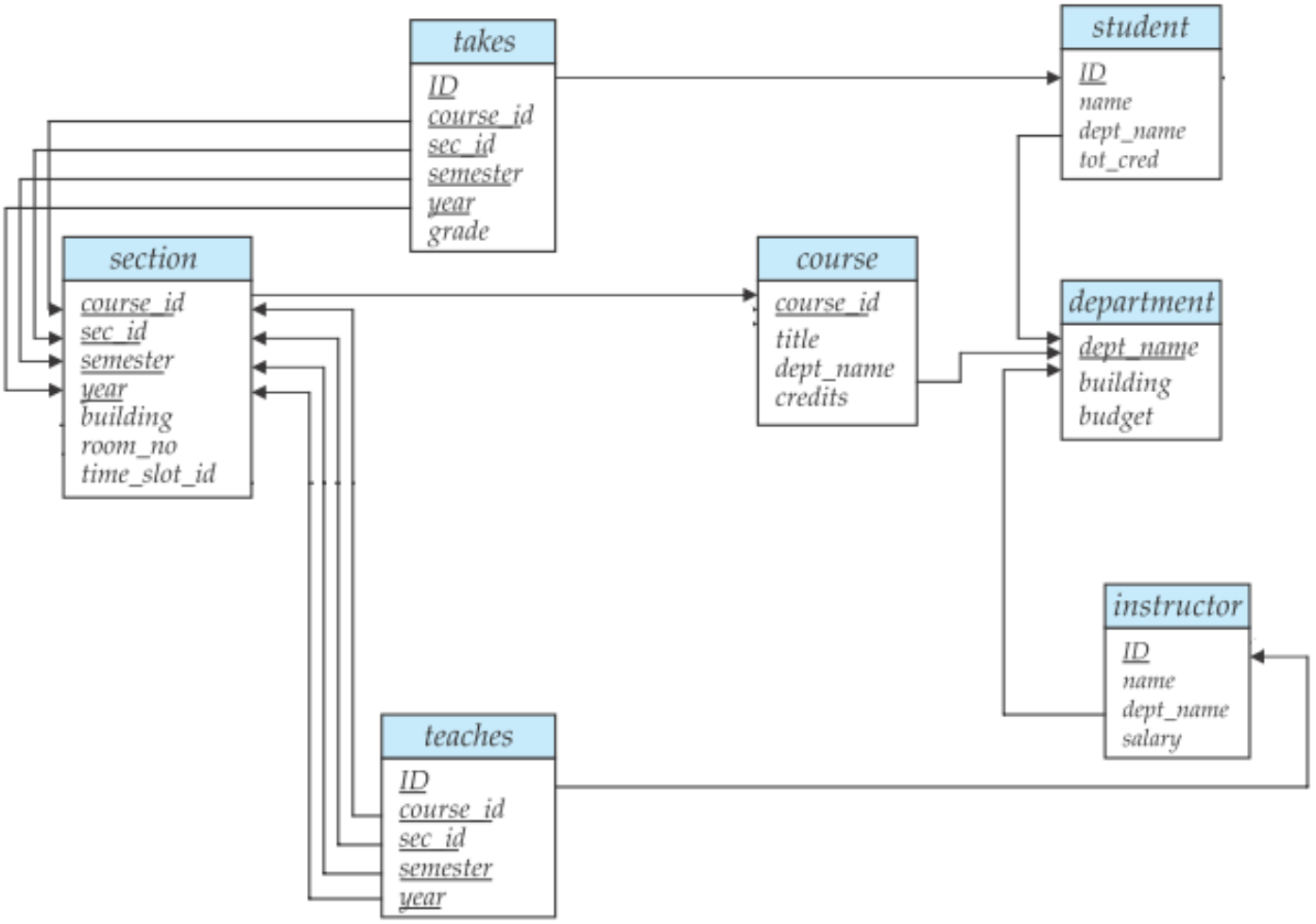

Figure 1: University database

2. ***Populate the university database with Data***: Use the SQL script (***insert_university.sql***), which is available on canvas, to populate the seven tables (see below) of the university database

dept_name	*building*	*budget*
Biology	Watson	90000
Comp. Sci.	Taylor	100000
Elec. Eng.	Taylor	85000
Finance	Painter	120000
History	Painter	50000
Music	Packard	80000
Physics	Watson	70000

department

ID	*name*	*dept_name*	*salary*
10101	Srinivasan	Comp. Sci.	65000
12121	Wu	Finance	90000
15151	Mozart	Music	40000
22222	Einstein	Physics	95000
32343	El Said	History	60000
33456	Gold	Physics	87000
45565	Katz	Comp. Sci.	75000
58583	Califieri	History	62000
76543	Singh	Finance	80000
76766	Crick	Biology	72000
83821	Brandt	Comp. Sci.	92000
98345	Kim	Elec. Eng.	80000

instructor

course_id	*title*	*dept_name*	*credits*
BIO-101	Intro. to Biology	Biology	4
BIO-301	Genetics	Biology	4
BIO-399	Computational Biology	Biology	3
CS-101	Intro. to Computer Science	Comp. Sci.	4
CS-190	Game Design	Comp. Sci.	4
CS-315	Robotics	Comp. Sci.	3
CS-319	Image Processing	Comp. Sci.	3
CS-347	Database System Concepts	Comp. Sci.	3
EE-181	Intro. to Digital Systems	Elec. Eng.	3
FIN-201	Investment Banking	Finance	3
HIS-351	World History	History	3
MU-199	Music Video Production	Music	3
PHY-101	Physical Principles	Physics	4

course

ID	*name*	*dept_name*	*tot_cred*
00128	Zhang	Comp. Sci.	102
12345	Shankar	Comp. Sci.	32
19991	Brandt	History	80
23121	Chavez	Finance	110
44553	Peltier	Physics	56
45678	Levy	Physics	46
54321	Williams	Comp. Sci.	54
55739	Sanchez	Music	38
70557	Snow	Physics	0
76543	Brown	Comp. Sci.	58
76653	Aoi	Elec. Eng.	60
98765	Bourikas	Elec. Eng.	98
98988	Tanaka	Biology	120

student

course_id	*sec_id*	*semester*	*year*	*building*	*room_number*	*time_slot_id*
BIO-101	1	Summer	2009	Painter	514	B
BIO-301	1	Summer	2010	Painter	514	A
CS-101	1	Fall	2009	Packard	101	H
CS-101	1	Spring	2010	Packard	101	F
CS-190	1	Spring	2009	Taylor	3128	E
CS-190	2	Spring	2009	Taylor	3128	A
CS-315	1	Spring	2010	Watson	120	D
CS-319	1	Spring	2010	Watson	100	B
CS-319	2	Spring	2010	Taylor	3128	C
CS-347	1	Fall	2009	Taylor	3128	A
EE-181	1	Spring	2009	Taylor	3128	C
FIN-201	1	Spring	2010	Packard	101	B
HIS-351	1	Spring	2010	Painter	514	C
MU-199	1	Spring	2010	Packard	101	D
PHY-101	1	Fall	2009	Watson	100	A

section

ID	*course_id*	*sec_id*	*semester*	*year*
10101	CS-101	1	Fall	2009
10101	CS-315	1	Spring	2010
10101	CS-347	1	Fall	2009
12121	FIN-201	1	Spring	2010
15151	MU-199	1	Spring	2010
22222	PHY-101	1	Fall	2009
32343	HIS-351	1	Spring	2010
45565	CS-101	1	Spring	2010
45565	CS-319	1	Spring	2010
76766	BIO-101	1	Summer	2009
76766	BIO-301	1	Summer	2010
83821	CS-190	1	Spring	2009
83821	CS-190	2	Spring	2009
83821	CS-319	2	Spring	2010
98345	EE-181	1	Spring	2009

teaches

ID	course_id	sec_id	semester	year	grade
00128	CS-101	1	Fall	2009	A
00128	CS-347	1	Fall	2009	A-
12345	CS-101	1	Fall	2009	C
12345	CS-190	2	Spring	2009	A
12345	CS-315	1	Spring	2010	A
12345	CS-347	1	Fall	2009	A
19991	HIS-351	1	Spring	2010	B
23121	FIN-201	1	Spring	2010	C+
44553	PHY-101	1	Fall	2009	B-
45678	CS-101	1	Fall	2009	F
45678	CS-101	1	Spring	2010	B+
45678	CS-319	1	Spring	2010	B
54321	CS-101	1	Fall	2009	A-
54321	CS-190	2	Spring	2009	B+
55739	MU-199	1	Spring	2010	A-
76543	CS-101	1	Fall	2009	A
76543	CS-319	2	Spring	2010	A
76653	EE-181	1	Spring	2009	C
98765	CS-101	1	Fall	2009	C-
98765	CS-315	1	Spring	2010	B
98988	BIO-101	1	Summer	2009	A
98988	BIO-301	1	Summer	2010	*null*

Takes

3. **Write SQL queries for the following (2*8 = 16 points)**

   a. Find courses that taught either in Fall 2009 or in Spring 2010.
   b. Find all instructors earning the highest salary (there may be more than one with the same salary).
   c. Find names and average salaries of all departments whose average salary > 42000
   d. For each department, find the maximum salary of instructors in that department. You may assume that every department has at least one instructor.
   e. Find the names of all students who have taken any Comp. Sci. course ever (there should be no duplicate names)
   f. Find the enrollment of each section that was offered in Spring 2009.
   g. Find the maximum enrollment, across all sections, in Spring 2009.
   h. Delete all courses that have never been offered (that is, do not occur in the section relation).

Submission Instructions

- Please put all of your SQL queries and their corresponding results (in table format) in one PDF file.
- The file name should be **YourLastName-CSCI330-HW2.pdf**.
- Upload the pdf file on canvas.

Late Policy

- No late work will be accepted.