JULIAN WELGE CSCD 327

CSCD 327 Lab #1 (16 points)

Section 1 - Basic Concepts:

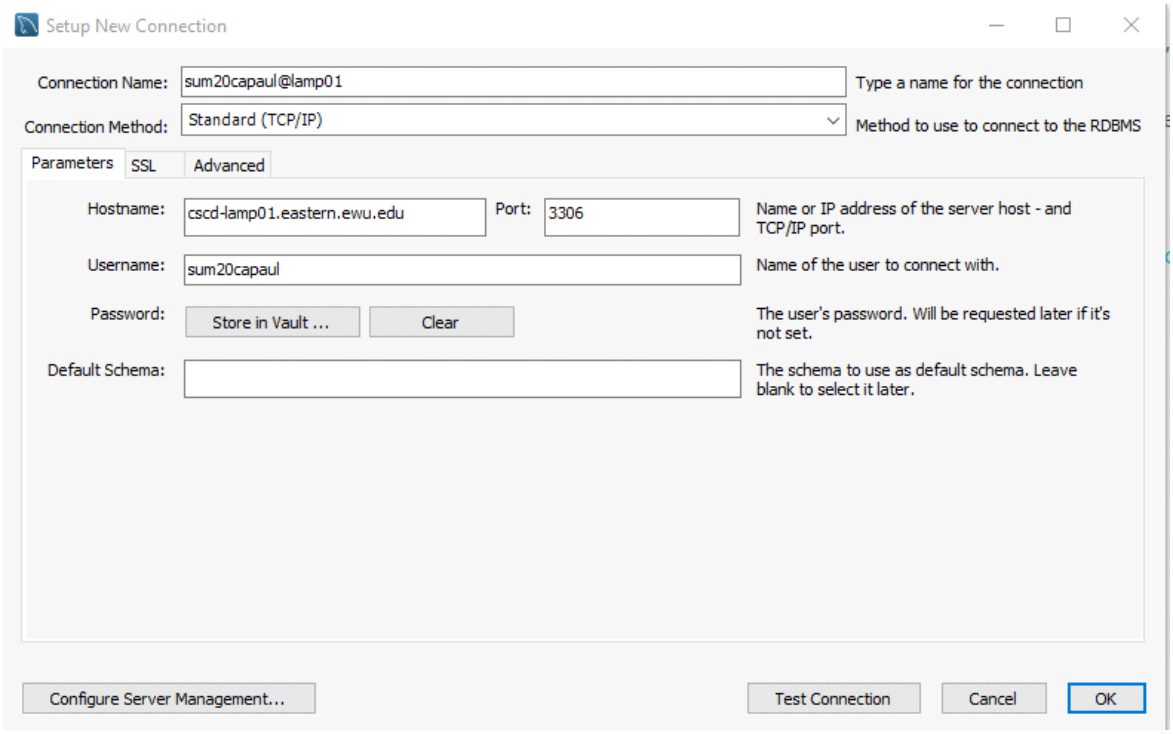
- (3 points)
    - Explain the following terms in the context of the relational data model. Use Employee-Department database from Appendix 1 (at the end of this lab) to provide examples of each term.
        - Relation - a relation is the set of attributes that uniformly construct the tuples in the table (Dept example - DEPTNO x DEPTNAME x CITY)
        - Attribute- is like a field describing aspects of tuples in the table. A persons iD, address, name, would all be attributes
        - Domain - the set of allowed values for each attribute (so for the cities in DEPT maybe your domain is only cities within the USA or something like that)
        - Tuple -
            A tuple is essentially a row or element in the table, with the columns describing certain attributes about it
        - Degree - from google -> generally refers to the number of tables linked together, similar to dimensions, if we linked two tables together it would be 2.
        - Cardinality - this refers to whether or not the table is 1:1 with another table or many to one, or one to many. One row can link to one row in another table or can link to multiple. Or multiple to one.
- (3 points)
    - Explain the following terms in the context of the relational data model. Use the Employee-Department database from Appendix 1 to provide examples of each term.
        - Candidate Key - a candidate key is the smallest form of a super key (where we can uniquely identify each tuple by looking at that attribute)
        - Primary Key - is a candidate key and is the first layer or category we look at to sort through the data in the table (i could say the date is a primary key)
        - Foreign Key - I found this on google -> A **FOREIGN KEY** is a **key** used to link two tables together. A **FOREIGN KEY** is a field

(or collection of fields) in one table that refers to the PRIMARY **KEY** in another table.

So I'm assuming if I set a primary key in Employee (ie: date) I could set a foreign key on the Dept side to point and link them together with same date on Dept side?

Section 2 - Warm-up Exercise:

Open up ***MySQL Workbench***, create a new connection, and fill in the form with the correct hostname, username, password, etc. You may want to save the connection for future use.



DB Host: cscd-lamp01.eastern.ewu.edu

DB Username: sum20*yourlastname* (all in lower case; NOTE: if you have the same last name as someone else (2 of you have a last name of morris), the last name is followed by the first initial of your first name)

DB Password: 1234

Port: 3306 (the default number)

Note: To access the server off-campus, you need to first connect to Eastern student VPN network (https://support.ewu.edu/support/solutions/articles/10000020118-how-do-i-connect-to-vpn-)

Maybe the first thing you want to do is to change your password. In the SQL editor, enter the following statement (then click the lightning bolt, which executes your SQL code) to re-set your password:

ALTER USER your_account_name IDENTIFIED BY 'new password goes here';

Now, create your first database named as *YourUsername*_DDL (note, substitute your actual user name for *YourUserName* – if it were Tom it would be sum20capaul_DDL):

create database *YourUsername*_DDL;

(don't forget to click lightning bolt to execute your code)

NOTE: The left portion of MySQL Workbench (Navigator) shows the schemas (databases) associated with your account under the Schemas tab. After you execute the above command, you can click on the (small) refresh button just below the Navigator frame and it should list your newly created database. Once you have the database created, you need to select this database (double click) to make sure the following operations will be applied to this database. Any time you add a database or tables to a database, clicking the refresh button should display the results of your operation.

NOTE 2: The second half of the Relational Model notes introduce most of the basic SQL you will need for the exercises below. Chapter 6 (6.5) of the text shows even more. It is also permissible (advisable?) to do a quick Google search as necessary.

- (1 point) Use appropriate DDL to create a new table containing the category code and description for the categories of books sold by a bookstore. The table should be called *CATEGORY*, and the columns should be *CatCode* and *CatDesc*. The *CatCode* column should store a maximum of 2 characters, and the *CatDesc* column should store a maximum of 10 characters. **(Include your DDL statements in your submission.)**

CREATE TABLE CATEGORY (CatCode varchar(2), CatDesc varchar(10));

- (1 point) Use appropriate DDL to create a new table containing these four columns: *Emp_num*, *Lastname*, *Firstname*, and *Job_class*. The table name should be *EMPLOYEES*. The *Job_class* column should be able to store character strings up to a maximum lenth of four. The *Emp_num* column contains a numeric ID and should allow a five-digit number. Use column sizes you consider suitable for the *Firstname* and *Lastname* columns. **(Include your DDL statements in your submission.)**

CREATE TABLE EMPLOYEES

(Job_class varchar(4),

Emp_num int,

FirstName varchar(100),

LastName varchar(100)

);

- (1 point) Use appropriate DDL to add two columns to the *EMPLOYEES* table. One column, named *EmpDate*, contains the date of employment for each employee. The second column, named *EndDate*, contains employees' date of termination. **(Include your DDL statements in your submission.)**

ALTER TABLE EMPLOYEES

ADD EmpDate date, ADD EndDate date;

- (1 point) Use appropriate DDL to modify the *Job_class* column of the *EMPLOYEES* table so that it allows storing a maximum width of two characters. **(Include your DDL statements in your submission.)**

ALTER TABLE EMPLOYEES

DROP Job_class;

ALTER TABLE EMPLOYEES

ADD Job_class varchar(2);

- (1 point) Use appropriate DDL to delete the *EndDate* column from the *EMPLOYEES* table. **(Include your DDL statements in your submission.)**

ALTER TABLE EMPLOYEES

DROP EndDate;

- (1 point) Use appropriate DDL to rename the *EMPLOYEES* table as *JL_EMPS*. **(Include your DDL statements in your submission.)**

RENAME TABLE EMPLOYEES to JL_EMPS

Section 3 – More Exercises:

Create a new database named as *YourUsername*_1:

create database *YourUsername*_1;

- (2 points) Use appropriate DDL to create two new tables *EMP* and *DEPT* (the info for these tables is in Appendix 1 at the end of this document). Please make sure to choose appropriate data type for each attribute, and **also add a primary key to each table**. **(Include your DDL statements in your submission.)**

CREATE TABLE EMP (
EMPNO int,
ENAME varchar(20),
JOB varchar(20),
MGR int,
HIREDATE date,
SAL int,
COMM int,
DEPTNO int);

CREATE TABLE DEPT (
DEPTNO int, DNAME varchar(50), LOC varchar(20));

- (1 point) Now you are ready to add new tuples into your tables.
    - Insert all 14 tuples listed in Appendix 1 into *EMP* table.

```
INSERT into EMP (EMPNO, ENAME, JOB, MGR, HIREDATE, SAL, COMM, DEPTNO)
VALUES
(7499, 'ALLEN', 'SALESMAN', 7698, '1981-02-20', 1600, 300, 30),
    (7521, 'WARD', 'SALESMAN', 7698, '1981-02-22', 1250,  500, 30),
    (7566, 'JONES', 'MANAGER', 7839, '1981-04-02', 2975, 0, 20),
    (7654, 'MARTIN', 'SALESMAN', 7698, '1981-09-28', 1250, 1400, 30),
    (7698, 'BLAKE',  'MANAGER', 7839, '1981-05-01', 2850, 0, 30),
    (7782, 'CLARK',  'MANAGER', 7839, '1981-06-09', 2450 , 0, 10),
    (7788, 'SCOTT',  'ANALYST', 7566, '1982-12-09', 3000 ,  0, 20),
    (7839, 'KING',  'PRESIDENT', null, '1981-11-17', 5000, 0, 10),
    (7844, 'TURNER', 'SALESMAN',  7698, '1981-09-08', 1500, 0, 30),
    (7876, 'ADAMS',  'CLERK', 7788, '1983-01-12', 1100, 0, 20),
    (7900, 'JAMES',  'CLERK', 7698, '1981-12-03',  950, 0, 30),
    (7902, 'FORD',   'ANALYST', 7566, '1981-12-03', 3000, 0, 20),
    (7934, 'MILLER', 'CLERK', 7782, '1982-01-23', 1300, 0, 10);
```

I kept running into an error saying the columns didn't match and thought it had to do with the null where all of the zeros are (that's why they're 0's) in the second to last column but then found the spot that was missing a null in one of the rows.

- Insert all 4 tuples listed in Appendix 1 into *DEPT* table.
  (**Include your DDL statements in your submission.**)

```
INSERT into DEPT ( DEPTNO, DNAME, LOC)
VALUES
```

(10, 'ACCOUNTING', 'NEW YORK'),

(20, 'RESEARCH', 'DALLAS'),

(30, 'SALES', 'CHICAGO'),

(40, 'OPERATIONS', 'BOSTON');

Section 4 – Get Ready for Future Labs:

- (1 point) Let's create four more databases and tables for future use. Name these four databases as *YourUsername*_2, *YourUsername*_3, *YourUsername*_4, and *YourUsername*_5. Now open/load four databases from the script files posted on Canvas:
  - Open/load ***database2.sql*** file into ***YourDatabase_2***. Five tables will be added to your *YourUsername*_2 database. Make sure you have selected ***YourDatabase_2*** before opening the sql file in the editor.
  - Open/load ***database3.sql*** file into ***YourDatabase_3***. Eight tables will be added to your *YourUsername*_3 database. Make sure database is selected first.
  - Open/load ***database4.sql*** file into ***YourDatabase_4***. Eleven tables will be added to your *YourUsername*_4 database. Make sure database is selected first.
  - Open/load ***database5.sql*** file into ***YourDatabase_5***. Seven tables will be added to your *YourUsername*_5 database. Make sure database is selected first.
  -

Appendix 1

Employee - Department Database

EMP

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7369	SMITH	CLERK	7902	1980-12-17	800		20
7499	ALLEN	SALESMAN	7698	1981-02-20	1600	300	30

7521	WARD	SALESMAN	7698	1981-02-22	1250	500	30
7566	JONES	MANAGER	7839	1981-04-02	2975		20
7654	MARTIN	SALESMAN	7698	1981-09-28	1250	1400	30
7698	BLAKE	MANAGER	7839	1981-05-01	2850		30
7782	CLARK	MANAGER	7839	1981-06-09	2450		10
7788	SCOTT	ANALYST	7566	1982-12-09	3000		20
7839	KING	PRESIDENT		1981-11-17	5000		10
7844	TURNER	SALESMAN	7698	1981-09-08	1500	0	30
7876	ADAMS	CLERK	7788	1983-01-12	1100		20
7900	JAMES	CLERK	7698	1981-12-03	950		30
7902	FORD	ANALYST	7566	1981-12-03	3000		20
7934	MILLER	CLERK	7782	1982-01-23	1300		10

DEPT

DEPTNO	DNAME	LOC
10	ACCOUNTING	NEW YORK
20	RESEARCH	DALLAS
30	SALES	CHICAGO
40	OPERATIONS	BOSTON