

CS450 – Database System Concepts

Fall 2015

Instructor: Dr. Jessica Lin

Homework 2 – Due 9/22

Problem 1.

Expand the ER diagram from Problem 3 on HW1 with the following information. You may use the solution posted for HW1.

- In HW1, each item belongs to only one category. Suppose we want to change this restriction and allow each item to belong to multiple categories. However, each item must belong to at least one category. Category examples: fruit, beverage, dairy, meat, bakery, etc.
- Each transaction is checked out by an employee.
- For each employee, record the following information: employee ID (unique), name, birthday and address.
- In addition, store all current and past positions for every employee. An employee works for a department on a job position, with start and end dates for this position. For example, Employee A was hired as a “bagger” (in Customer Service Department) on 09/01/2012, and later promoted to “produce clerk” (in Produce Department) on 06/01/2013.

Some examples on Department: Customer Service, Produce, Meat, Bakery, Pharmacy, etc.

- An employee is categorized as either a full-time or a part-time employee (but not both). A full-time employee receives annual salary, whereas a part-time employee receives hourly wages.

Same as HW1:

Draw the ER diagram for the given database, identifying the following:

- (i) all the entity sets and their attributes;
- (ii) all the relationship sets;
- (iii) all the required key constraints and participation constraints;
- (iv) the primary key for each entity set (and weak entity set, if any).

In some cases, you may have to make your own constraint assumptions. Clearly state, and justify your assumptions. Does your diagram capture all the given requirements? If not, specify which requirement(s) is (are) not captured.

While there are many variations of ER diagrams, please follow the same notations used in the textbook.

Problem 2.

The following questions concern the ER diagram resulting from Problem 1:

a) Convert the entity-relationship design to a schema for a relational database. List all relational schema. For each relational schema, state

- (i) the name of the relation,
- (ii) the names of its attributes,
- (iii) the domain (or data type) of each attribute,
- (iv) the primary key (by underline), and
- (v) the foreign key(s).

Example schema:

Instructor(SSN: string, name: string, dept_name: string, salary: real)

Foreign Key (dept_name) references Department

b) Use Oracle on VSE LAB machine to create the tables from a) above and insert at least two tuples to each table. Implement all these in one script (text) file.

Submission instruction:

What/when/how to submit: Submit a hard copy AND an electronic copy of ALL problems (no loose paper please). Make sure you turn in a separate script file for item b) of Problem 2 (see below). Use PDF for the other problems. Please follow the guidelines below. Any violations might cause you to lose points.

1. Prepare your submission:

Create a script file by putting all the commands (SQL statements, no sqlplus prompts and outputs) in **ONE** file, then run it in sql*plus. Send the script file in text format. Note that text file means **only ASCII code is allowed**. If you use a word processor, make sure you save the file in ASCII format. No other formats are acceptable.

If you are using Windows, make sure to use Notepad, or save as text file.

Before you submit, please run your script file to make sure it is executable. **Un-executable script files will receive zero for 2(b)! No exceptions.**

Please name your script file in this way: Initial letter of your first name + your last name + ".sql". For example, if your name is John Smith, your script file should be JSmith.sql.

Again, the file you are submitting is **an executable .sql file**, no .txt file or other types.

2. Format of your .sql file:

As the first few lines of the text file, put your **name**, the **assignment number**, and your **email address** in these few lines.

Be sure to add comment symbol before and after them.

Here is an example:

```
// Student: John Smith
// Assignment #1
// Instructor – Dr. Jessica Lin
// Email: jsmith@gmu.edu
```

3. Where to submit:

Please note that the only place for submission is "Assignments" module in Blackboard - click on the "Assignments" icon on the homepage of Blackboard class site, then click on the "HW1" icon and the homework submission page comes out. If you'd like, you can also add your comments. **Submission via email is not acceptable.**

Please bring a paper copy to class on the due date.

Some Hints:

Oracle DBMS:

1. If you have troubles creating a table, try to clean up your database. Proceed as follows:

```
select table_name
from all_tables
where owner='YOURACCOUNTNAMEINUPPERCASE';
to see what tables you have in your database. Then use
drop table table_name;
to delete them in sqlplus.
```

2. If you still have troubles creating a particular table, try a different name. A name (like order, group, etc) may be a reserved word.

3. When creating tables that contain foreign keys, make sure the tables that are referenced have already been created.