

Homework 1-Database Design

Due: Friday 30th 2020 at 11:59PM

Objectives

Understand and apply the Database designer role by...

- Apply the basic steps of systems analysis and design
- Apply the basic stages of database development
- Understand the purpose and role of a data model
- Apply knowledge of how to transform EE-R data models into relational model
- Use basic SQL statements to transfer your data model design into the logical model to work with the chosen RDBMS
- Learn how to use MySQL as an example for a RDBMS

Introduction

Bellevue College is a 4-year undergraduate school located in the Puget Sound region of Washington State. Dr. Gary Locke is the Interim President of Bellevue College, and Dr. Kristen Jones is the provost (a provost is a vice president of academics; the deans of the divisions report to the provost). Bellevue College--like many colleges and universities-- needs to provide a College's Mentor Program.

The college is looking for a volunteer to help develop a data model for the Mentor Program Information System. The system will be used by Bellevue College's Mentor Program. The Bellevue College Mentor Program recruits business professionals as mentors for the college students. The mentors are unpaid volunteers who work together with the students' advisors to ensure that the students in the mentoring program learn needed and relevant management skills.

Requirements

Here is some information that describes how the Mentor's program works at Bellevue College. Bellevue College's Mentor Program interacts with students, advisors, mentors, and also college alumni, since the program administrators view alumni as potential mentors.

At Bellevue College, all students live on or off-campus and are assigned a unique Bellevue College ID number and email account in the format of FirstName.LastName@bellevuecollege.edu. The students last name, first name, College ID number, email address, dorm name, dorm room number, dorm phone number, and their off-campus address are all information that we know about each student. Also, we keep track of the date a student enrolled at Bellevue college, the date the student graduated, and the degree the student received.

All faculty advisors have on-campus offices and are assigned a unique Bellevue College ID number and email accounts in the format FirstName.LastName@bellevuecollege.edu. The faculty's last name, first name, college ID number, email address, department, office building name, office building room number, and office phone number are all information known about each faculty. A faculty member could be a Bellevue College alumnus.

All Bellevue College alumni live off campus and were previously assigned a unique Bellevue College ID number. Alumni have private email accounts in the format [FirstName.LastName@somewhere.com](#). The alumnus last name, first name, former-student number, email address, home address, home city, home state, home ZIP code, and phone number are all known information about the alumnus. Bellevue College does have alumni return for further study.

Bellevue College mentors work for companies and use their company address, phone, and email address for contact information. They do not have Bellevue college ID numbers as mentors. Email addresses are in the format [FirstName.LastName@companyname.edu](#). The mentor is tracked by their last name, first name, email address, company name, company address, company city, company state, company ZIP code, and company phone number. Each mentor may be an alumnus, but mentors are not required to be alumni. Alumni cannot, of course, be required to become mentors.

At Bellevue College each student is assigned one and only one faculty advisor and must have an advisor. One faculty member may advise several students, but faculty members are not required to advise students. The date an advisor was assigned to a student and the date the assignment ended are recorded. Also, each student may be assigned one and only one mentor, but students are not required to have a mentor. One mentor may mentor several students, and a person may be listed as a mentor before he or she is actually assigned students to mentor. When a mentor is assigned to a student, the date of assignment to a student and the date the assignment ended are both recorded.

The College required that each mentor to be assigned to work and coordinate with one and only one faculty member, and each mentor must work with a faculty member. One faculty member may work with several mentors, but faculty members are not required to work with mentors. The date an advisor was assigned to work with a mentor and the date the assignment ended are also recorded

Tasks

1. Draw an EE-R data model for the Bellevue College Mentor Program Information System (BCMIS). **Use MySQL Workbench E-R model to present your EE-R diagrams.** Justify, the decisions you make regarding minimum and maximum cardinalities
2. **Convert this data model to a Relations database. Specify tables, primary keys, and foreign keys.**
 - a. Map out the EE-R model to the equivalent logical Relational Model and define the final schema
 - b. Write SQL Create Table statements for each of these tables. Consider avoiding the mistake of creating a table that does already exist in the schema

- c. Write foreign key constraints for the relationships in each of these tables. Make your own assumptions regarding Cascading deletions or updates and justify those assumptions (Hint you can combine the SQL for your answers to part B and C)
- d. Write drop statements for all of your tables and schema at the end of the script

What to Submit

Upload to Canvas

1. Upload a document that includes
 - a. A picture of the created EER model using MySQL workbench
 - b. A complete SQL Script for task 2 (a-d)
2. Upload a **.mwb** file that includes the answers for Task 1 EER model
3. Upload the **.sql** file that includes the answers for task 2(a-d)

Grading

To grant a full grade your submission has to consider submitting all required files to canvas and your design should have

1. **EER Model covers all the listed requirements for the BCMIS (20 pts)**
 - a. Correct Entities Sets
 - b. Correct identified Attributes sets for each entity
 - c. Primary keys have been identified for each entity
 - d. Correct cardinality constraints identified for each Relationship
 - e. Correct participation constraints have been identified
 - f. EER Model is designed using MySQL Workbench. This is the only acceptable option; any other tool will not be graded.
2. **SQL Script that shows (20 pts)**
 - a. Mapping from EER to Relational Model has been accurately done
 - b. Error free complete SQL Script that executed correctly and it includes:
 - i. Creation for the Schema
 - ii. Creation for all the tables in the correct order that doesn't violate any constraints or cause an error. Handling the case of creating an existing table issue has been considered
 - iii. The SQL statements include the enforced relational constraints in the designed schema. The constraints include: Key, Entity and Referential Integrity constraints

- iv. Assumption regarding Cascading deletions or updates are enforced and justified.
- v. Auto generated scripts are not acceptable. I want you to practice writing scripts and not use auto generating tools