San José State University
Department of Applied Data Science

DATA 201
Database Technologies
for Data Analytics

Spring 2025
Section 21
Instructor: Ron Mak

Assignment #3a

Assigned: Thursday, February 6
Due: Thursday, February 13 at 5:30 pm
              Team assignment, 100 points max

Data modeling

The purpose of this assignment is to give you practice creating a conceptual model with an entity-relationship (ER) diagram, mapping it to a logical model in the form of a relational schema, and then creating the physical model as a MySQL database. Use the online **ERDPlus** tools at https://erdplus.com to create an ER diagram. Map the diagram to a relational schema, and then create physical tables from the exported schema.

You can start with the database you created for Assignment #2, or you can create an entirely new database. This can be an early design draft of your team database project for the semester.

Conceptual data model requirements

In a short report (1 or 2 pages), list at least 10 of your conceptual data model's requirements:

- What entities need to be in the database?
- What major attributes will the entities have?
- What relationships will be between entities?

ER diagram

Use ERDPlus to create an ER diagram. The diagram should capture the requirements that you listed. The diagram should contain:

- At least one of each type of relationships (1:1, 1:M, M:N)
- At least one entity with optional attributes
- At least one entity with derived attributes
- At least one entity with multivalued attributes
- At least one entity with composite attributes

Make one or more screenshots of your ER diagram.

Relational schema

Use ERDPlus to convert your ER diagram to a relational schema. Make sure the schema is what you expect and that it indicates foreign keys with an arrow from each foreign key to the target primary key. Clean up the schema by arranging the tables nicely. A nice table arrangement has few crossing arrows. Make one or more screenshots of your relational schema.

Physical tables

Use ERDPlus to export your relational schema to SQL commands to create the tables. Use the `CREATE` commands either in a Python program or in MySQL Workbench to create the tables. You do not need to populate the tables.

Put the `CREATE` commands into a text file.

EER diagram

Connect to your newly created database from MySQL Workbench, and "reverse engineer" the database to generate extended entity-relationship (EER) diagram. See https://medium.com/@tushar0618/how-to-create-er-diagram-of-a-database-in-mysql-workbench-209fbf63fd03. Rearrange the tables as necessary.

Make one or more screenshots of your EER diagram.

What to submit

- The short report containing at least 10 conceptual data model requirements.
- Screenshot(s) of your ER diagram in ERDPlus.
- Screenshot(s) of your relational schema in ERDPlus.
- A text file containing the SQL `CREATE` commands exported by ERDPlus.
- Screenshot(s) of the EER diagram of your database generated by MySQL Workbench.

Rubric

Criteria	Max points
• A short report containing at least 10 conceptual data model requirements.	• 20
• Screenshot(s) of your ER diagram in ERDPlus.	• 50
• Screenshot(s) of your relational schema in ERDPlus.	• 10
• A text file containing the SQL **CREATE** commands exported by ERDPlus.	• 10
• Screenshot(s) of the EER diagram of your database generated by MySQL Workbench.	• 10