

# DATA 225

## Database Systems for Analytics

Spring 2023  
Section 22  
Instructor: Ron Mak

### Assignment #4a

Assigned: Monday, February 20  
Due: Monday, February 27 at 5:30 pm  
Team assignment, 100 points max

### Constraints and normalization

- Normalize the tables of your team database to 3NF if they aren't already normalized. Use ERDPlus to draw a relational schema diagram of the normalized tables of your database. You can use your database from Assignment #3 or create a new one. You can start with an ER diagram which you then map to a relational schema.
- Generate SQL **CREATE TABLE** commands for your tables. Be sure they include foreign key constraints. Use the commands in a Python notebook.
- In your Python or notebook (it can be the same one as above), use SQL **INSERT INTO** commands to populate each table with around 5 rows of example data. To practice using named constraints and the SQL **ALTER TABLE** command, create named constraints for at least one of the tables, and use the **ALTER TABLE** command with a named constraint on at least one table.
- In your Python notebook, use SQL **SELECT** commands to display the contents of each table in dataframes.

### What to submit

- The relational schema diagram of your normalized tables.
- Your Python notebook that uses **CREATE TABLE** commands to create the tables.
- Your Python notebook that uses **INSERT INTO** commands and **ALTER TABLE** commands to alter and populate your tables.
- Your Python notebook that uses **SELECT** commands to display the tables in dataframes.

Zip all your texts, screen shots, and Python code into one or more files for submission into Canvas.

## Rubric

Criteria	Max points
<ul style="list-style-type: none"><li>• Relational schema.</li></ul>	<ul style="list-style-type: none"><li>• 20</li></ul>
<ul style="list-style-type: none"><li>• <b>CREATE TABLE</b> commands with foreign key constraints (Python code).</li></ul>	<ul style="list-style-type: none"><li>• 35</li></ul>
<ul style="list-style-type: none"><li>• <b>INSERT INTO</b> and <b>ALTER TABLE</b> commands (Python code).</li></ul>	<ul style="list-style-type: none"><li>• 35</li></ul>
<ul style="list-style-type: none"><li>• <b>SELECT</b> commands to display table contents in dataframes (Python code).</li></ul>	<ul style="list-style-type: none"><li>• 10</li></ul>