Prac #6
Using MySQL Workbench for Creating a Database Model (II)
(Importing data from external files to the database model)

Note

Complete all tasks following all instructed in this prac (Prac #6). For each step, you are required to save your work as a specified file form to submit for marking.

- **Learning outcomes and objectives**

  Student will be able to:
  - create a relational database for a given conceptual model (ERD) using MySQL Workbench
  - import raw data from the external file to a table using MySQL Workbench facility

- **Pre-requisites**

  You are assumed to have completed previous pracs in order to be familiar with necessary features of MySQL Workbench for creating full version of ERDs (Prac #1, #2, #3) and for creating a physical database using MySQL Workbench facilities like 'forward engineering' (Prac #5).
  You are assumed the detailed knowledge of ER notation and ERD. Chapter 3 &4 from Coronel-Morris textbook, which explains relational database models and ER modeling are also required reading.

- **Overview**

  Through the last prac activities you learned the general procedure working on MySQL Workbench - from creating a conceptual model in ERD to implementing a database physical schema using the forward engineering process.

  In this prac, you are going to further practise working on MySQL Workbench by developing a simple relational database for a small e-book library using MySQL Workbench. Through this lab activity, you will get experience using essential database facilities provided by your DBMS (MySQL Workbench) to create a full relational database having actual data records contained.

- **Files provided**

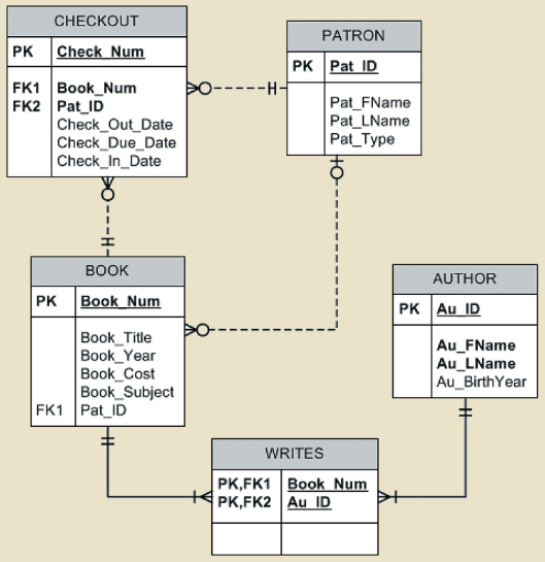
  Download the following files provided via LearnJCU
  - author.csv
  - book.csv
  - checkout.csv
  - patron.csv
  - writes.csv

- **Task Overview**

Use MySQL Workbench to create a relational database consisting of five tables as shown in the ERD provided.

This is a simple ERD for a small imaginary library which manages a collection of online books for use by a group of patrons. Patrons are allowed to check out a book and the library also keeps the data about authors of each book.

Note: To simplify determining which patron currently has a given book checked out, a redundant relationship between BOOK and PATRON is maintained.



Using MySQL Workbench, you have two alternative ways to create this database.

The first way is using MySQL Workbench facilities to create database schema and tables and to fill the table with data by import facility, without writing/running SQL queries.

The second way is using SQL queries in MySQL Workbench to create tables and insert all necessary data to the table created.

You will use the first way in this prac, while the second way (writing SQL queries) will be done in a later prac session (Prac #7).

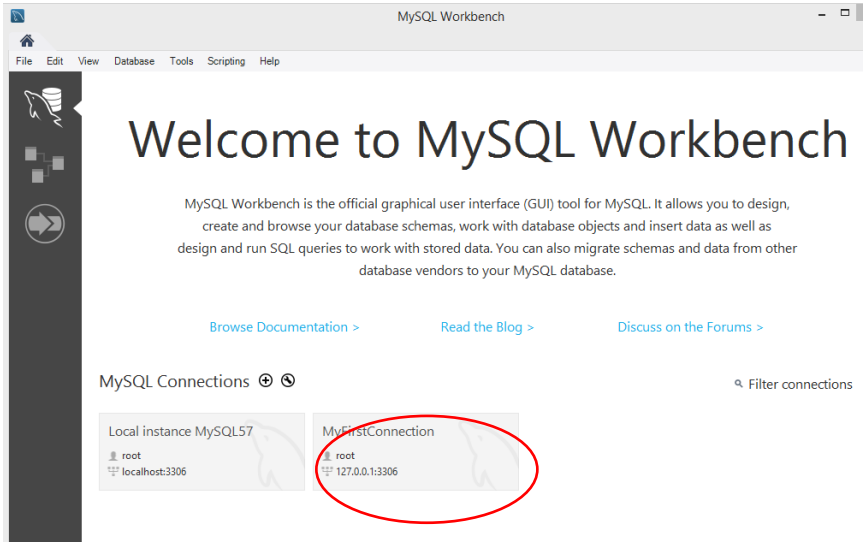
The task for this prac is to create a database using useful database facilities provided by MySQL Workbench: forward engineering, importing data from external files etc.

The required steps are summarised here:

- Step 1: Create an ER diagram (logical model) on MySQL Workbench.
- Step 2: Apply forward engineering process to construct the physical schema based on the logical model created in Step 1, and then back-up your database as a skeleton database.
- Step 3: Import a raw data (provided as a 'comma-delimited' text file like .txt or .csv) to each table.
- Step 4: Back-up your updated database (having actual data) using 'export' facility

Step 1: Create an ERD on MySQL Workbench

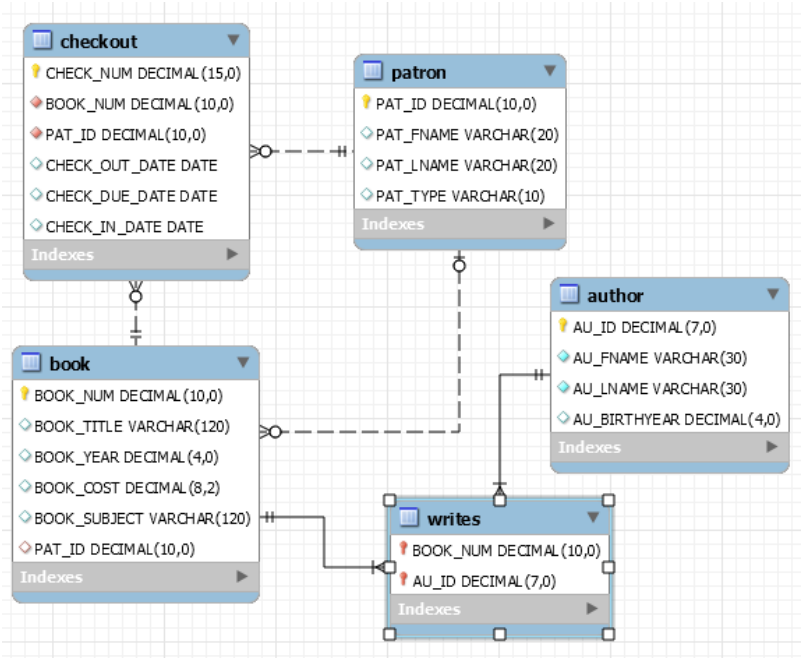
1. Run MySQL Workbench and make the connection appropriately.



2. Select 'New Model' under the File menu (on the top menu bar). This will create a new tab called 'MySQL Model'

3. Double-click 'Add Diagram' on the 'Model Overview' panel. This will create a new tab called 'EER Diagram'

4. On 'EER Diagram' tab, create an ERD having all necessary components required set properly. The final ERD should look like the image as shown below.

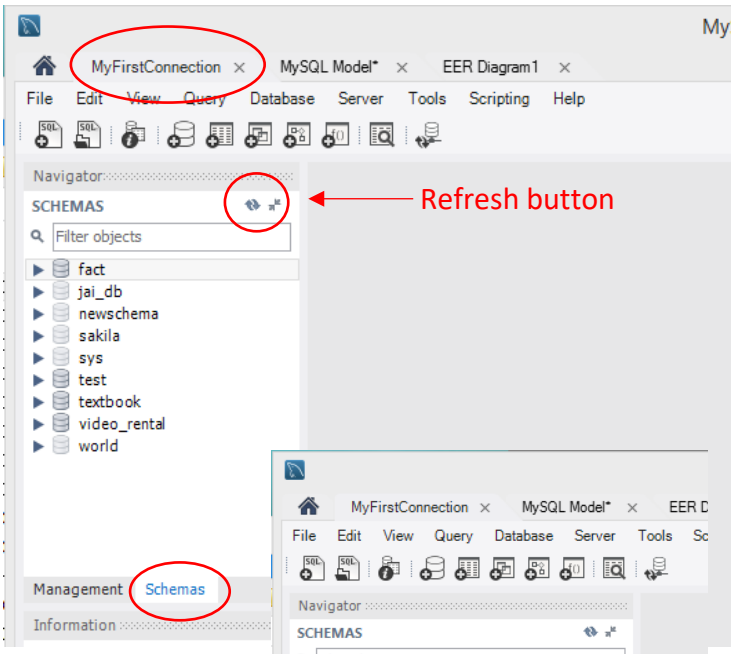


5. Rename your schema as you want.

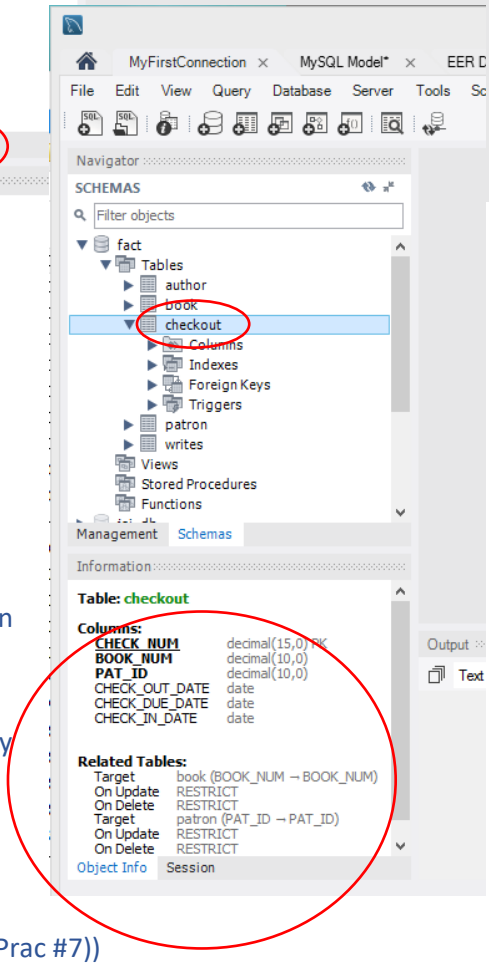
6. Save this ERD model as a file named 'fact.mwb'. At the end of this prac, you will have to submit this file to be marked off.

Step 2: Apply forward engineering process to construct the physical schema based on the logical model created in Step 1.

1. Go to Database menu and click 'Forward engineer …'
2. Proceed to complete the forward engineering process (refer to previous prac (Prac #5))
3. Go to the connection tab (e.g. 'MyFirstConnection') and look on the SCHEMAS navigator panel to see if there is a new database schema you created. (click the refresh button to update the list of SCHEMAS if needed)



4. Open the database you created (by clicking the database name on SCHEMAS panel) and check if all tables are created correctly. Currently the table has no actual data contents but has only columns (attributes) set in proper data types. You can check each table's structure in details through corresponding 'Information' panel.



Note: You are assumed to create and set all columns properly (setting data type and properties as requested) when you create the ERD in Step 1. However, if you find you need to modify some column properties (e.g. change column name or data type), you can change it in several different ways:

1) You can revisit EER Diagram tab and modify any property as wanted and then apply forward engineering process to create a new (updated) database schema, or

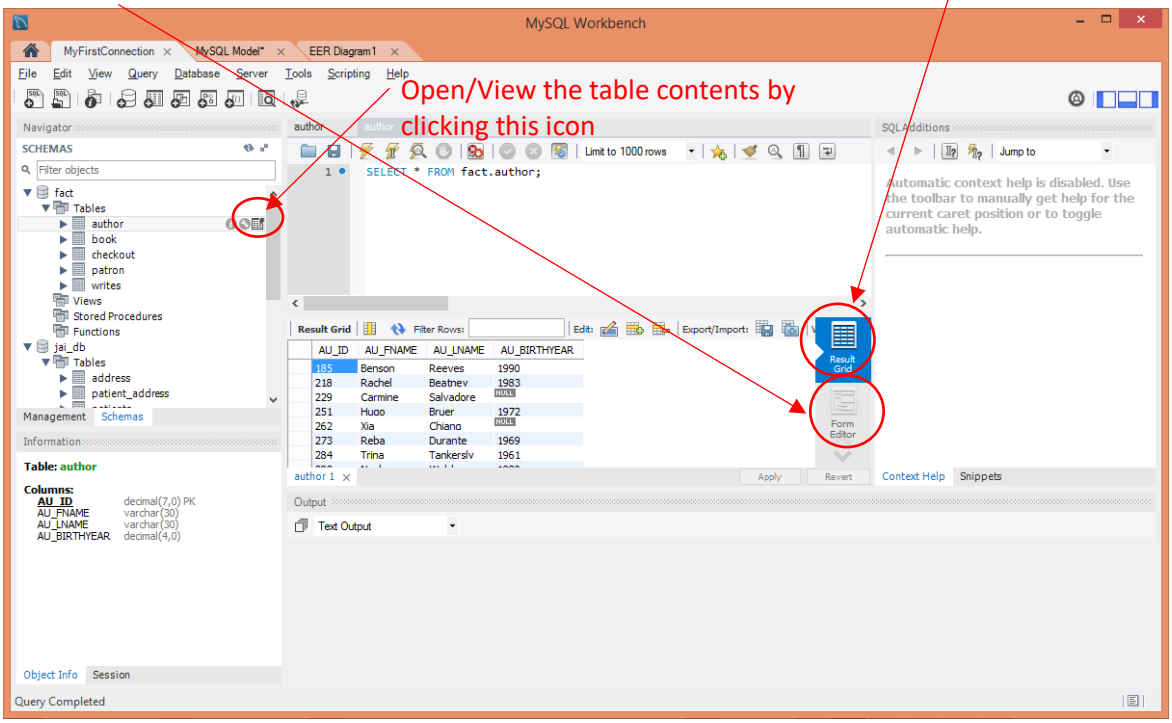
2) You can create a SQL query to alter the table structure. (you will try this way in the later prac (Prac #7))

5. Save (export) the database as a dump file named 'fact_skeleton_db.sql'. You are not required to submit this file, but simply keep this file for your own back-up skeleton database.

Step 3: Import a raw data (provided as a 'comma-delimited' text file) to each table

There are various ways to enter data to a table.

- Way 1): Open/View the table contents and enter data records directly using 'Result Grid' or 'Form Editor' facilities.



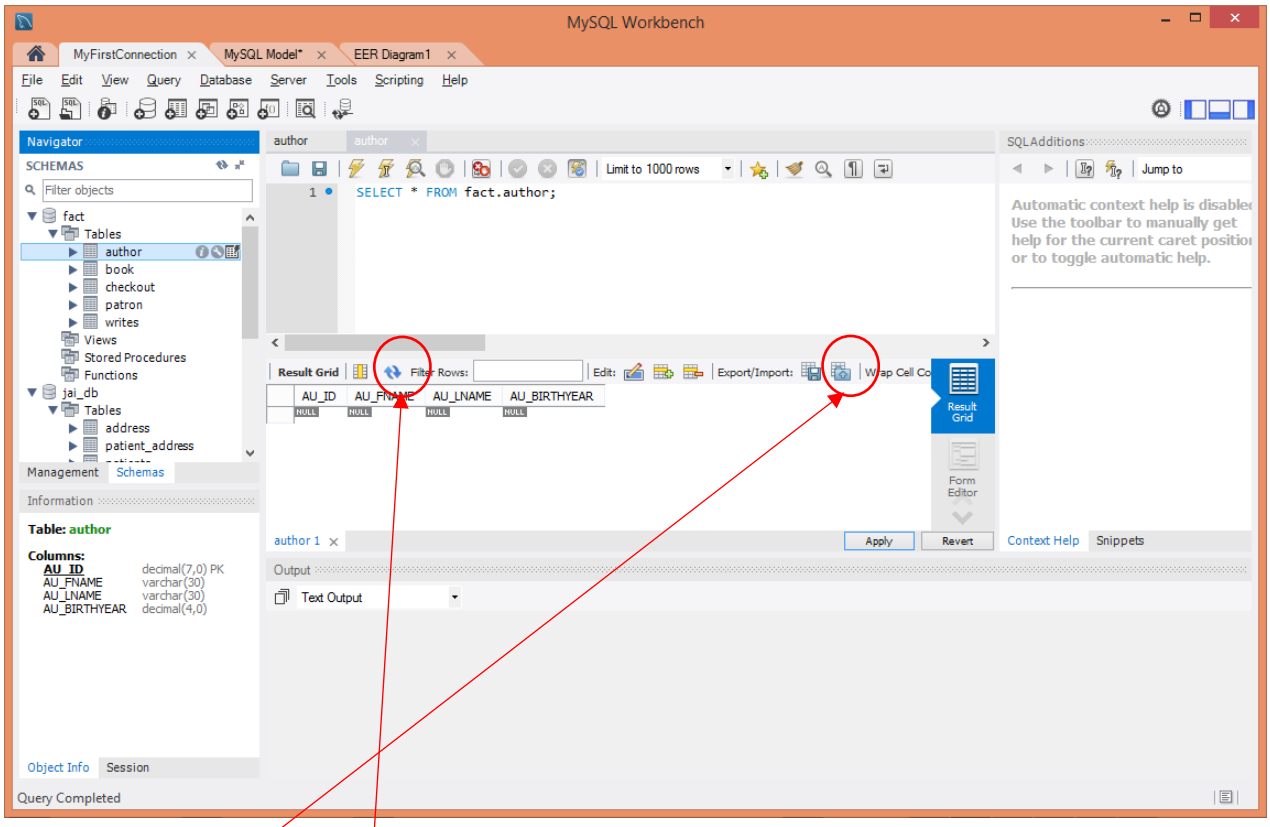
- Way 2): Write/Run a SQL query to insert data to a table (you will learn this later in Prac #7)

- Way 3): Use 'Import' facility to import data from an external file

Among these three ways, let's practice the third way here to import data from a given data file. MySQL Workbench allows to import data in the CSV (comma separated value) format.

For this prac, you are provided five CSV files, one for each of the five tables. Please download them (from LearnJCU Prac #6 folder) before starting following instructions.

1. Select the author table from the Schemas navigator and click the table-viewer icon. You will see an empty table structure having column names only.



2. Click the button to import records from an external file.
3. Locate the file 'author.csv' in your computer and select the file to open and import.
4. On the "Select Destination" screen, choose "Use existing table:" and select fact.author from the drop-down box, then click "Next >".
5. On the "Configure Import Settings" screen you should see the source column names and destination column names. Ensure that these match, then click "Next >".
6. On the "Import Data" screen, click "Next >", and "Next >" again after execution has completed.
7. On the "Import Results" screen, if everything has worked correctly, you will see a line stating "15 records imported". Click "Finish".
8. If you now click the 'Refresh' button you will see all records from author.csv are imported to the author table.
9. ~~Click 'Apply' to complete the process of inserting records automatically by MySQL Workbench SQL generator. Consequently, MySQL generates a series of SQL queries to insert the imported data and execute.~~ *(Note: This step is removed because the recent version of MySQL Workbench does not require this step)*
10. Apply the same process for other four tables (book, checkout, patron, writes) to import data from corresponding CSV files (book.csv, checkout.csv, patron.csv, writes.csv)

Note: When you proceed this step, you will have to be careful the order of importing data to each table. If you want to import data to a table which contains any foreign key, you always need to import data to the related (referenced) table firstly. For example, the "book" table contains a FK Pat_ID which is a PK of "patron" table, thus you have to fill the "patron" table firstly before importing data to "book" table.

11. Fully check (through SCHEMAS navigator) that all tables and data records are correctly imported.

Step 4: Back-up your updated database (having actual data) using 'export' facility

1. Save (export) the database (having full data records) as another dump file named 'fact_full_db.sql'. At the end of this prac, you will have to submit this file to be marked off.

This is the end of Prac #6.
You are required to submit via LearnJCU the following two files to be marked off:

- fact.mwb (after completing Step 1) – 1.5 marks
- fact_full_db.sql (after completing Step 2, 3 and 4) – 1.5 marks