

Prac #4

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

- **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 prac (Prac #3) in order to be familiar with necessary features of MySQL Workbench for creating full version of ERDs.

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 relational database.

The experience you gain through this prac activity will directly help you to complete the final assignment of this subject.

- **Files provided**

Download the following files provided via LearnJCU

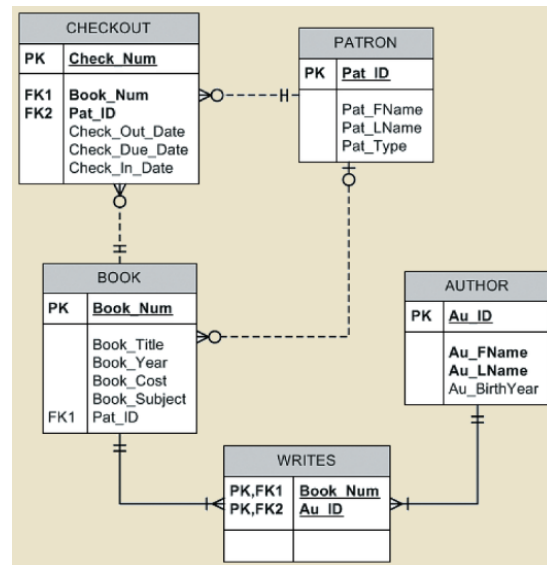
- author.csv
- book.csv
- checkout.csv
- patron.csv
- writes.csv

- **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.

One 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 other 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 later prac session (Prac #6) of this subject.

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:

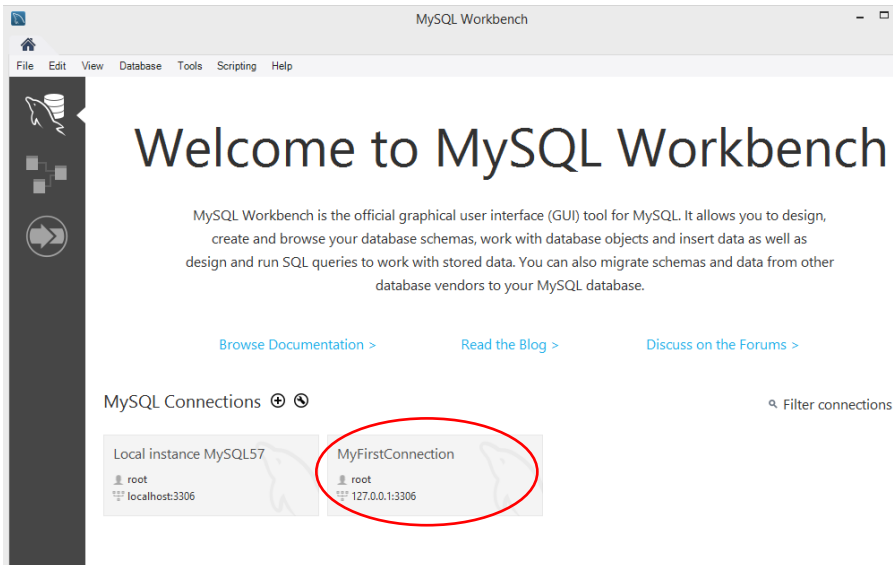
- Step 1: Create an ER diagram (logical model) on MySQL Workbench.
- Step 2: Apply forward engineering process to construct the physical schema based on the logical model created in Step 1.
- Step 3: Import a raw data (provided as a 'comma-delimited' text file like .txt or .csv) to each table.
- Step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

- **Task**

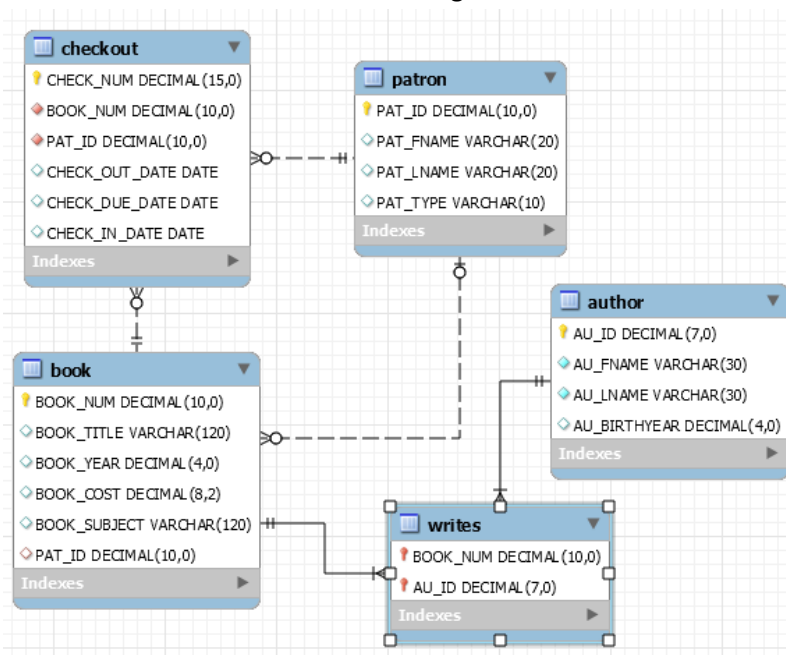
Create a database using useful database facilities provided by MySQL Workbench

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.

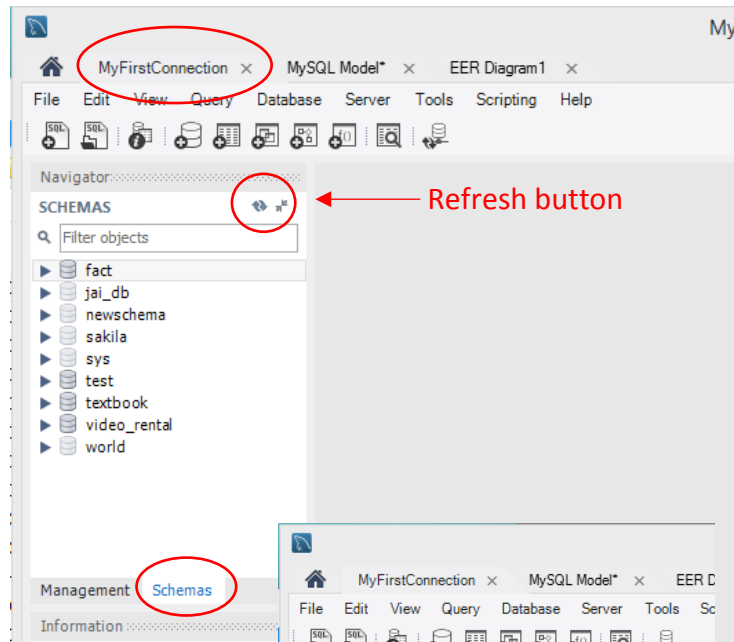


5. Rename your schema as you want.
6. Save this ERD model as a file named 'fact.mwb' and submit the file (or show to your prac tutor during prac class) to be marked off.

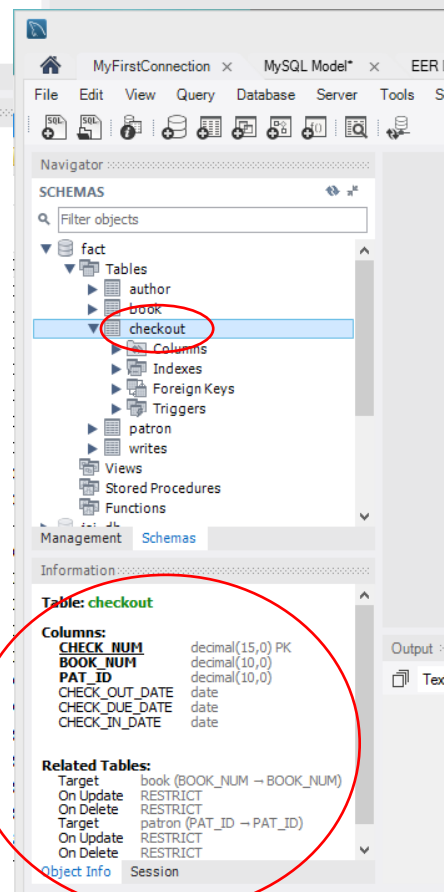
Step 2: Apply forward engineering process to construct the physical schema based on the logical model created in Step 1.

1. Go to Database menu and click 'Forward engineer ...'
2. Proceed to complete the forward engineering process (refer to previous week's lab)

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.



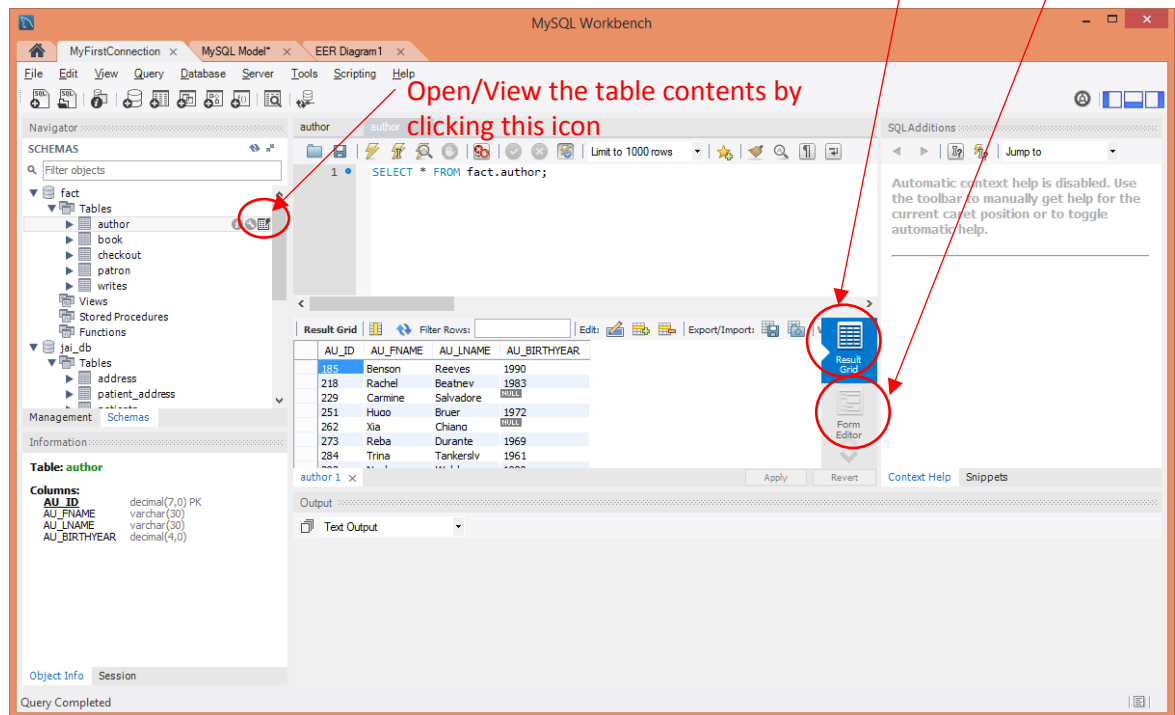
Note: You are assumed to create and set all columns properly (setting data type and properties as requested) when you create the ERD in Step 1. However, if you find you need to modify some column properties (e.g. change column name or data type), you can change it in several different ways:

- 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 #6)

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.

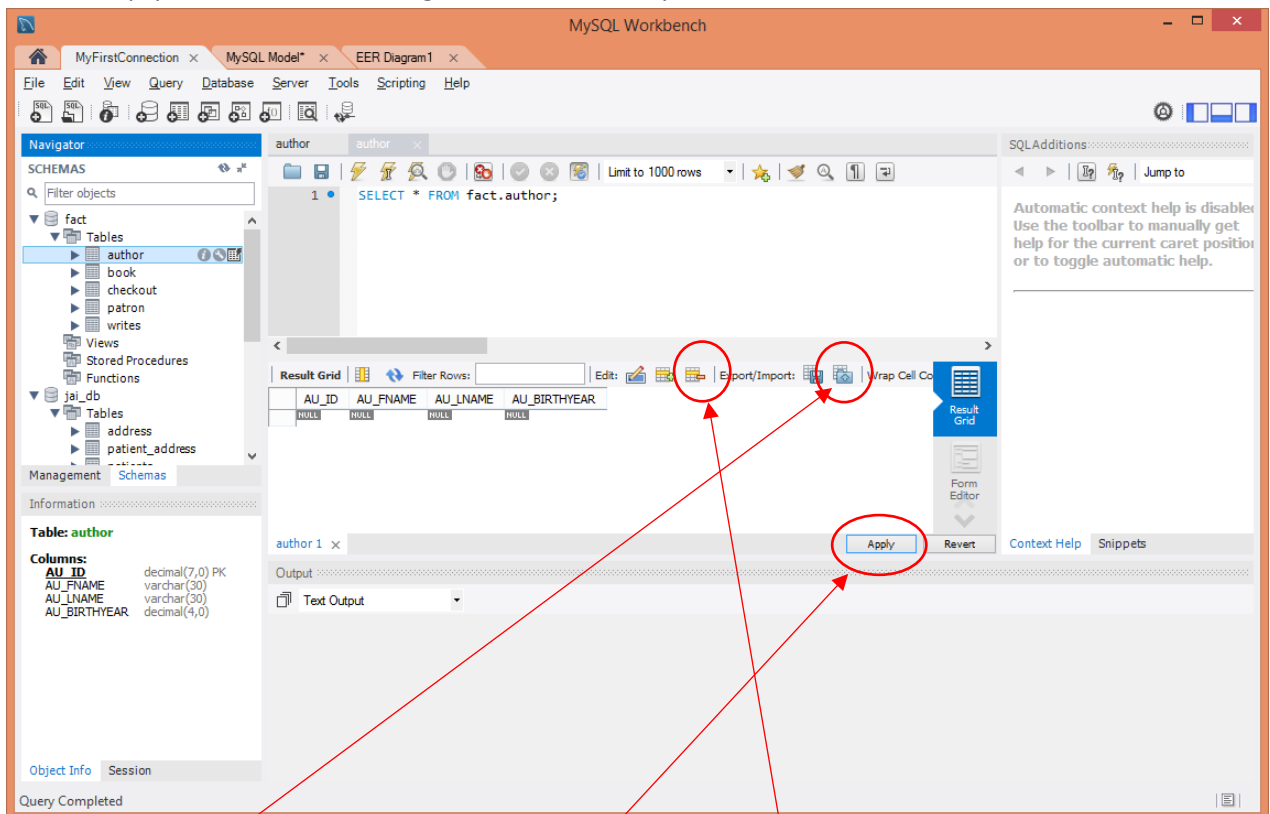


- Way 2): Write/Run a SQL query to insert data to a table (you will learn this later in Prac #6)
- Way 3): Use 'Import' facility to import data from an external file

Among these three ways, let's practice the third way here to import data from a given data file.

MySQL Workbench allows to import a text file (in a form of .csv) where each field data in a record is delimited by 'comma'. For this lab, you are provided five text files for five tables respectively. Please download them and save in your computer 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. You will see all records from author.csv are imported to the author table. You will find the first record is filled with the header row (having column names) of the original file. Delete this unnecessary record by selecting the row and clicking the 'delete selected rows' button.

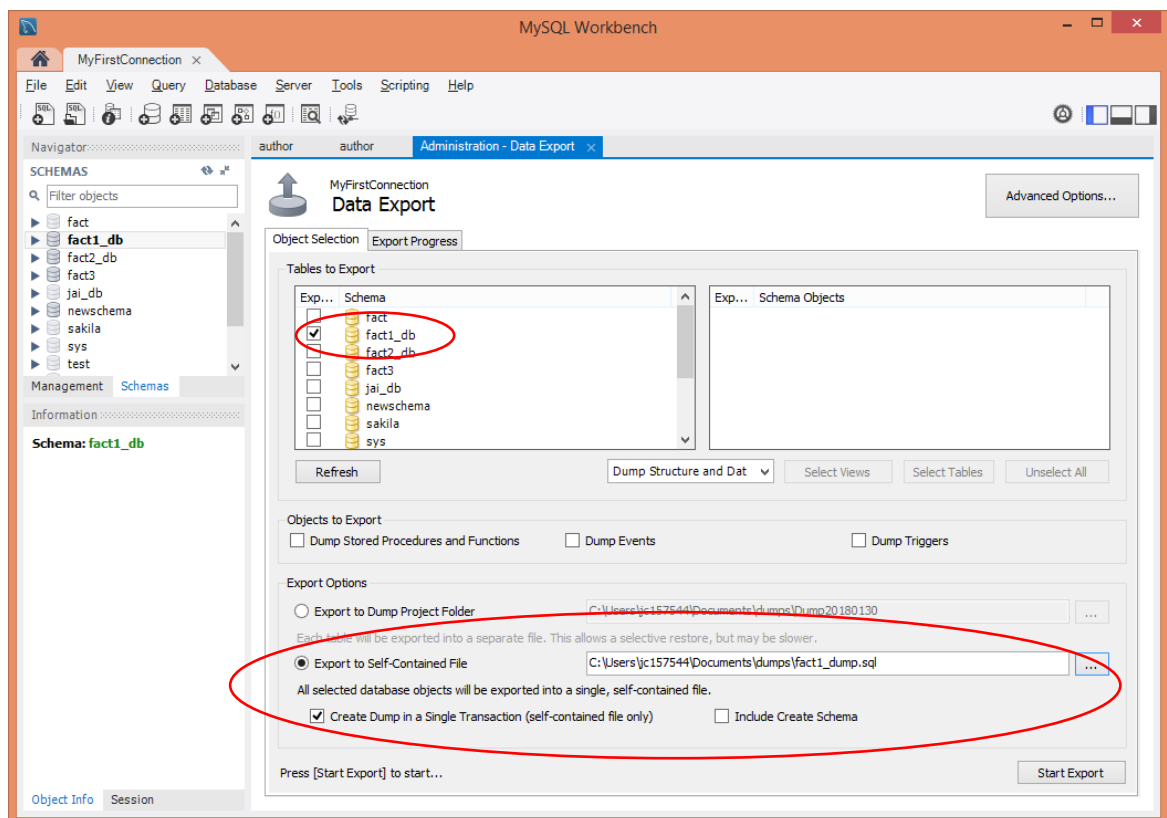
Note: Also, check if the current records imported contain any empty data cell. In order to make sure your DBMS treats the empty cell as a pure 'null', please select the empty cell and delete it (on MySQL Workbench). You will find the empty cell changes into **null** which indicates it contains now really nothing (null).

5. 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.
6. Apply the same process for other four tables (book, checkout, patron, writes) to import data from corresponding external text files (book.txt, checkout.txt, patron.txt, writes.txt)
7. 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

In particular if you use the computer in University labs, do not forget to back up your updated database as a self-contained file (.sql) to your own storage.

1. Go to Server menu (on the top menu bar) and select 'Data Export' menu. This facility enables you to save the database as a self-contained file (.sql) so that you can open the database anywhere when needed in the future.
2. Select your database to export. Select "Export to Self-Contained File" option under Export Options section. Also, click "create Dump in a Single Transaction" option. Do not forget to set the location and file name (e.g. fact1_dump.sql) where you want to save.



3. Click 'Start Export' button. (Click 'Continue Anyway' if you pop-up with a warning message like "version mismatch ...")
4. Submit (or show your prac tutor) this exported dump file (e.g. fact1_dump.sql) to be marked off this week's prac activity.

This is the end of Prac #4.

You are required to submit (or show your tutor in class) the following two files to be marked off:

- fact.mwb
 - fact1_dump.sql
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