Lab Four: More CRUD

At the end of this lab, you should have:

- be able to run MySQL queries on the server using a script;
- designed and implemented generated columns in MySQL;
- designed and implemented constraints in MySQL;
- designed and implemented an indexed foreign key relationship in MySQL.

You should also have answered the relevant questions at the end of the lab sheet. The above statements are the *learning outcomes* of this laboratory and will be achieved in concert with the other learning activities that you undertake for this unit.

Task One: Running as a Script

1. For the rest of today's workshop (and those in the future, if you so desire), ensure that you compile the commands for each activity into a separate `.txt` (or `.sql`) file named after the particular activity (for example, `LabQuestion1.txt`, or similar).
    - You can then run these files on the MySQL server using the command described in the lecture slides (`\. filename`), after you have compiled the contents within them.
    - Ensure you connect to the server and enter SQL mode before running the script.
    - As an example and for practice, create a file/script containing just the following command: `SELECT * FROM TransactionItem;`

Task Two: Generated Columns

2. Consider our `TransactionItem` table from last week and the column named `totalPrice` that was the multiplication of `quantity` and `unitPrice`.
    a. First, (carefully) drop this `totalPrice` column from the `TransactionItem` table.
    b. Next, re-create the `totalPrice` column, however it should be generated from the other columns, rather than manually entered by the user.
3. Once you have done the above, create another column named `taxAmount` which determines the amount (value) of GST on each item (from `totalPrice`).
    - Recall that the GST payable can be calculated as 1/11th of the GST-inclusive price.

Task Three: Constraints

4. Modify the TransactionItem table to add in four additional constraints:
    a. `unitPrice` and `quantity` must be greater than zero (two constraints);
    b. `hasGst` should be set to `FALSE` (`0`) as a default value;
    c. `description` should not be null (look back to last week!)
5. At the end of this worksheet in the 'Questions' section, write the full `SELECT` queries (including `WHERE` clauses) to select the following data from `TransactionItem`:

a. The description and unit price of items which are greater than $110.00 in unit price;

b. All details of items which have a quantity that is not equal to one;

c. Descriptions of items that have a description beginning with the letter B;

d. The description and unit price of items which are less than $201.00 in unit price and have GST applied to the item.

Task Four: Transaction Table and Related Job

6. Create and fill the new `Transaction` table with the following data, recalling the date format from the previous lecture! Create the table using the required MySQL statements, ensuring you reflect the foreign key relationship to `TransactionItem`'s `id`. Then, fill the table utilising the data below and the relevant MySQL statements.

id	date	customerName	transactionItem
1	1/1/2022	Example Corporation	4
2	1/4/2022	Nikola Limited	2
3	1/4/2023	Pear Computers	1
4	31/7/2023	Western Mining	3

7. Create indexes on the `id` field in both `Transaction` and `TransactionItem`. Once you have done this, you can then quit the server as you have finished for the day.

End of activities. Please see the next page for the questions you may wish to answer.

Questions

Ensure you can answer these questions to cement your understanding of the lab.

1. Write down the queries required to answer the questions in the above lab sheet.

End of Lab Four.