CMPT 310:
Laboratory 5

Books & DB Normalization

SQL DDL

   CREATE Tables

     Primary Key Constraints   ____5____ /5

     Foreign Key Constraints   ____5____ /5

     Data Types / Constraints

      ISBN   ____1____ /1

      Title/Name   ____0____ /1

      Author/Pub ID   ____1____ /1

      Date   ____2____ /1

      Lead Author   ____2____ /1

      Position   ____1____ /1

SQL DML

   DROP Tables   ____3____ /3

   INSERT Statements   ____0____ /6

_____

TOTAL   ____17____ /25

```
Starting Docker Containers...
--------------------------------------------------------------------------------
Creating network "asafari_default" with the default driver
Creating cmpt310_db ...
Creating cmpt310_db ... done
Creating cmpt310_www ...
Creating cmpt310_www ... done

--------------------------------------------------------------------------------
```

```
————————————————————————————————————————————————————————————————————————————
lab5.sql Tests
————————————————————————————————————————————————————————————————————————————
————————————————————————————————————————————————————————————————————————————
                                                   Test #0
————————————————————————————————————————————————————————————————————————————
Importing lab5.sql
————————————————————————————————————————————————————————————————————————————
Creating clean schema
  mysql> DROP SCHEMA IF EXISTS Lab5;
  mysql> CREATE SCHEMA Lab5;

Importing lab5.sql
  mysql> SOURCE lab5.sql

Tables
  mysql> SHOW TABLES;
        +----------------+
        | Tables_in_Lab5 |
        +----------------+
        | Author         |
        | Authorship     |
        | Book           |
        | Publisher      |
        | Volume         |
        +----------------+
Describing Tables

Table: Author

  mysql> DESCRIBE Author;
        +-------+-------------+------+-----+---------+-------+
        | Field | Type        | Null | Key | Default | Extra |
        +-------+-------------+------+-----+---------+-------+
        | ID    | decimal(4,0)| NO   | PRI | NULL    |       |
        | Name  | varchar(25) | NO   |     | NULL    |       |
        +-------+-------------+------+-----+---------+-------+
  mysql> SELECT COUNT(*) AS 'Author Rows' FROM Author;
        +-------------+
        | Author Rows |
        +-------------+
        |           0 |
        +-------------+

Table: Authorship

  mysql> DESCRIBE Authorship;
        +---------------+-------------+------+-----+---------+-------+
        | Field         | Type        | Null | Key | Default | Extra |
        +---------------+-------------+------+-----+---------+-------+
        | Book_ISBN     | decimal(13,0)| NO  | PRI | NULL    |       |
        | Author_ID     | decimal(4,0)| NO   | PRI | NULL    |       |
        | RoyaltyPercent| decimal(3,2)| NO   |     | NULL    |       |
        | LeadAuthor    | varchar(25) | NO   |     | NULL    |       |
        | Position      | int         | NO   |     | NULL    |       |
        +---------------+-------------+------+-----+---------+-------+
  mysql> SELECT COUNT(*) AS 'Authorship Rows' FROM Authorship;
        +-----------------+
        | Authorship Rows |
        +-----------------+
        |               0 |
        +-----------------+
```

Table: Book

```
mysql> DESCRIBE Book;
+----------------+--------------+------+-----+---------+-------+
| Field          | Type         | Null | Key | Default | Extra |
+----------------+--------------+------+-----+---------+-------+
| ISBN           | decimal(13,0)| NO   | PRI | NULL    |       |
| Title          | varchar(25)  | NO   |     | NULL    |       |
| Publisher_Date | date         | NO   |     | NULL    |       |
| Publisher_ID   | decimal(4,0) | NO   | MUL | NULL    |       |
+----------------+--------------+------+-----+---------+-------+
mysql> SELECT COUNT(*) AS 'Book Rows' FROM Book;
+-----------+
| Book Rows |
+-----------+
|         0 |
+-----------+
```

Table: Publisher

```
mysql> DESCRIBE Publisher;
+-------+--------------+------+-----+---------+-------+
| Field | Type         | Null | Key | Default | Extra |
+-------+--------------+------+-----+---------+-------+
| ID    | decimal(4,0) | NO   | PRI | NULL    |       |
| Nane  | varchar(25)  | NO   |     | NULL    |       |
+-------+--------------+------+-----+---------+-------+
mysql> SELECT COUNT(*) AS 'Publisher Rows' FROM Publisher;
+----------------+
| Publisher Rows |
+----------------+
|              0 |
+----------------+
```

Table: Volume

```
mysql> DESCRIBE Volume;
+------------------+--------------+------+-----+---------+-------+
| Field            | Type         | Null | Key | Default | Extra |
+------------------+--------------+------+-----+---------+-------+
| Series_Book_ISBN | decimal(13,0)| NO   | PRI | NULL    |       |
| Volume_Book_ISBN | decimal(13,0)| NO   | PRI | NULL    |       |
| Position         | decimal(2,0) | YES  |     | NULL    |       |
+------------------+--------------+------+-----+---------+-------+
mysql> SELECT COUNT(*) AS 'Volume Rows' FROM Volume;
+-------------+
| Volume Rows |
+-------------+
|           0 |
+-------------+
```

```
--------------------------------------------------------------------
--------------------------------------------------------------------
                              Test #1
--------------------------------------------------------------------

--------------------------------------------------------------------
Querying DB for imported books
--------------------------------------------------------------------

ERROR 1054 (42S22) at line 1 in file: 'QueryTable.sql': Unknown column 'Publisher.Name' in 'field list'
1,10d0
< +-----------+---------------+---------------+--------------------------------+----------------+---------------+--------------------------------------+-------------+----------+--------------------+-------------+---------------+------------+----------------+
< | PublisherID | PublisherName | SeriesISBN    | SeriesTitle                    | SeriesPosition | ISBN          | Title                                | PublishDate | AuthorID | AuthorName         | DateOfBirth | RoyaltyPercent | LeadAuthor | AuthorPosition |
< +-----------+---------------+---------------+--------------------------------+----------------+---------------+--------------------------------------+-------------+----------+--------------------+-------------+---------------+------------+----------------+
< |     10001 | HarperCollins |          NULL | NULL                           |           NULL | 9780060244880 | The Chronicles of Narnia             | 2007-08-14  |     1001 | C. S. Lewis        | 1898-11-29  |          20.0 | Y          |              1 |
< |     10001 | HarperCollins |          NULL | NULL                           |           NULL | 9780007525515 | The Hobbit & The Lord of the Rings   | 2007-04-17  |     1000 | J. R. R. Tolkien   | 1892-01-03  |           5.0 | Y          |              1 |
< |     10001 | HarperCollins | 9780007525515 | The Hobbit & The Lord of the Rings |          1 | 9780261102217 | The Hobbit                           | 2007-04-17  |     1000 | J. R. R. Tolkien   | 1892-01-03  |           3.0 | Y          |              1 |
< |     10002 | Pearson       |          NULL | NULL                           |           NULL | 9780133544619 | Modern Database Management (12th Edition) | 2015-07-13 |     1004 | Jeffery A. Hoffer  | 1970-01-01  |          10.0 | Y          |              1 |
< |     10002 | Pearson       |          NULL | NULL                           |           NULL | 9780133544619 | Modern Database Management (12th Edition) | 2015-07-13 |     1005 | V. Ramesh          | 1971-01-01  |           2.0 | N          |              2 |
< |     10002 | Pearson       |          NULL | NULL                           |           NULL | 9780133544619 | Modern Database Management (12th Edition) | 2015-07-13 |     1006 | Heikki Topi        | 1972-01-01  |           2.0 | N          |              3 |
< +-----------+---------------+---------------+--------------------------------+----------------+---------------+--------------------------------------+-------------+----------+--------------------+-------------+---------------+------------+----------------+

--------------------------------------------------------------------
--------------------------------------------------------------------
                              Test #2
--------------------------------------------------------------------

--------------------------------------------------------------------
Querying DB for imported books
--------------------------------------------------------------------

ERROR 1054 (42S22) at line 1 in file: 'QueryTable.sql': Unknown column 'Publisher.Name' in 'field list'
1,10d0
< +-----------+---------------+---------------+--------------------------------+----------------+---------------+--------------------------------------+-------------+----------+--------------------+-------------+---------------+------------+----------------+
< | PublisherID | PublisherName | SeriesISBN    | SeriesTitle                    | SeriesPosition | ISBN          | Title                                | PublishDate | AuthorID | AuthorName         | DateOfBirth | RoyaltyPercent | LeadAuthor | AuthorPosition |
< +-----------+---------------+---------------+--------------------------------+----------------+---------------+--------------------------------------+-------------+----------+--------------------+-------------+---------------+------------+----------------+
< |     10001 | HarperCollins |          NULL | NULL                           |           NULL | 9780060244880 | The Chronicles of Narnia             | 2007-08-14  |     1001 | C. S. Lewis        | 1898-11-29  |          20.0 | Y          |              1 |
< |     10001 | HarperCollins |          NULL | NULL                           |           NULL | 9780007525515 | The Hobbit & The Lord of the Rings   | 2007-04-17  |     1000 | J. R. R. Tolkien   | 1892-01-03  |           5.0 | Y          |              1 |
< |     10001 | HarperCollins | 9780007525515 | The Hobbit & The Lord of the Rings |          1 | 9780261102217 | The Hobbit                           | 2007-04-17  |     1000 | J. R. R. Tolkien   | 1892-01-03  |           3.0 | Y          |              1 |
< |     10002 | Pearson       |          NULL | NULL                           |           NULL | 9780133544619 | Modern Database Management (12th Edition) | 2015-07-13 |     1004 | Jeffery A. Hoffer  | 1970-01-01  |          10.0 | Y          |              1 |
< |     10002 | Pearson       |          NULL | NULL                           |           NULL | 9780133544619 | Modern Database Management (12th Edition) | 2015-07-13 |     1005 | V. Ramesh          | 1971-01-01  |           2.0 | N          |              2 |
< |     10002 | Pearson       |          NULL | NULL                           |           NULL | 9780133544619 | Modern Database Management (12th Edition) | 2015-07-13 |     1006 | Heikki Topi        | 1972-01-01  |           2.0 | N          |              3 |
< +-----------+---------------+---------------+--------------------------------+----------------+---------------+--------------------------------------+-------------+----------+--------------------+-------------+---------------+------------+----------------+

--------------------------------------------------------------------
--------------------------------------------------------------------
                              Test #3
--------------------------------------------------------------------

--------------------------------------------------------------------
Importing ALL the books...
--------------------------------------------------------------------

  mysql> SOURCE InsertEverything.sql
  ERROR 1054 (42S22) at line 1 in file: 'InsertEverything.sql': Unknown column 'DateOfBirth' in 'field list'
  ERROR 1054 (42S22) at line 1 in file: 'QueryTable.sql': Unknown column 'Publisher.Name' in 'field list'
1,34d0
< +-----------+------------------------+---------------+--------------------------------+----------------+---------------+--------------------------------------+-------------+----------+--------------------+-------------+---------------+------------+----------------+
< | PublisherID | PublisherName        | SeriesISBN    | SeriesTitle                    | SeriesPosition | ISBN          | Title                                | PublishDate | AuthorID | AuthorName         | DateOfBirth | RoyaltyPercent | LeadAuthor | AuthorPosition |
< +-----------+------------------------+---------------+--------------------------------+----------------+---------------+--------------------------------------+-------------+----------+--------------------+-------------+---------------+------------+----------------+
< |      NULL | NULL                   |          NULL | NULL                           |           NULL |          NULL | NULL                                 | NULL        |     1003 | Hed Tighe          | 1980-01-01  |          NULL | NULL       |           NULL |
< |     10001 | HarperCollins          |          NULL | NULL                           |           NULL | 9780060244880 | The Chronicles of Narnia             | 2007-08-14  |     1001 | C. S. Lewis        | 1898-11-29  |          20.0 | Y          |              1 |
< |     10001 | HarperCollins          |          NULL | NULL                           |           NULL | 9780060598242 | The Chronicles of Narnia             | 2004-10-26  |     1001 | C. S. Lewis        | 1898-11-29  |          12.0 | Y          |              1 |
< |     10001 | HarperCollins          |          NULL | NULL                           |           NULL | 9780007525515 | The Hobbit & The Lord of the Rings   | 2007-04-17  |     1000 | J. R. R. Tolkien   | 1892-01-03  |           5.0 | Y          |              1 |
< |     10001 | HarperCollins          |          NULL | NULL                           |           NULL | 9780261102385 | The Lord of the Rings                | 2007-04-17  |     1000 | J. R. R. Tolkien   | 1892-01-03  |           1.6 | Y          |              1 |
< |     10001 | HarperCollins          | 9780060244880 | The Chronicles of Narnia       |              1 | 9780060234973 | The Magician's Nephew                | 2007-08-14  |     1001 | C. S. Lewis        | 1898-11-29  |          15.0 | Y          |              1 |
< |     10001 | HarperCollins          | 9780060244880 | The Chronicles of Narnia       |              2 | 9780060234812 | The Lion, the Witch and the Wardrobe | 2007-08-14  |     1001 | C. S. Lewis        | 1898-11-29  |          15.0 | Y          |              1 |
< |     10001 | HarperCollins          | 9780060244880 | The Chronicles of Narnia       |              3 | 9780060234881 | The Horse and His Boy                | 2007-08-14  |     1001 | C. S. Lewis        | 1898-11-29  |          15.0 | Y          |              1 |
< |     10001 | HarperCollins          | 9780060244880 | The Chronicles of Narnia       |              4 | 9780060234836 | Prince Caspian                       | 2007-08-14  |     1001 | C. S. Lewis        | 1898-11-29  |          15.0 | Y          |              1 |
< |     10001 | HarperCollins          | 9780060244880 | The Chronicles of Narnia       |              5 | 9780060234867 | The Voyage of the Dawn Treader       | 2007-08-14  |     1001 | C. S. Lewis        | 1898-11-29  |          15.0 | Y          |              1 |
< |     10001 | HarperCollins          | 9780060244880 | The Chronicles of Narnia       |              6 | 9780060234959 | The Silver Chair                     | 2007-08-14  |     1001 | C. S. Lewis        | 1898-11-29  |          15.0 | Y          |              1 |
< |     10001 | HarperCollins          | 9780060244880 | The Chronicles of Narnia       |              7 | 9780060234935 | The Last Battle                      | 2007-08-14  |     1001 | C. S. Lewis        | 1898-11-29  |          15.0 | Y          |              1 |
< |     10001 | HarperCollins          | 9780007525515 | The Hobbit & The Lord of the Rings |          1 | 9780261102217 | The Hobbit                           | 2007-04-17  |     1000 | J. R. R. Tolkien   | 1892-01-03  |           3.0 | Y          |              1 |
< |     10001 | HarperCollins          | 9780007525515 | The Hobbit & The Lord of the Rings |          2 | 9780261102354 | The Fellowship of the Ring           | 2007-04-17  |     1000 | J. R. R. Tolkien   | 1892-01-03  |           1.2 | Y          |              1 |
< |     10001 | HarperCollins          | 9780007525515 | The Hobbit & The Lord of the Rings |          3 | 9780261102361 | The Two Towers                       | 2007-04-17  |     1000 | J. R. R. Tolkien   | 1892-01-03  |           1.3 | Y          |              1 |
< |     10001 | HarperCollins          | 9780007525515 | The Hobbit & The Lord of the Rings |          4 | 9780261102378 | Return of the King                   | 2007-04-17  |     1000 | J. R. R. Tolkien   | 1892-01-03  |           1.4 | Y          |              1 |
< |     10001 | HarperCollins          | 9780261102385 | The Lord of the Rings          |              1 | 9780261102354 | The Fellowship of the Ring           | 2007-04-17  |     1000 | J. R. R. Tolkien   | 1892-01-03  |           1.2 | Y          |              1 |
< |     10001 | HarperCollins          | 9780261102385 | The Lord of the Rings          |              2 | 9780261102361 | The Two Towers                       | 2007-04-17  |     1000 | J. R. R. Tolkien   | 1892-01-03  |           1.3 | Y          |              1 |
< |     10001 | HarperCollins          | 9780261102385 | The Lord of the Rings          |              3 | 9780261102378 | Return of the King                   | 2007-04-17  |     1000 | J. R. R. Tolkien   | 1892-01-03  |           1.4 | Y          |              1 |
< |     10000 | Houghton Mifflin Harcourt |       NULL | NULL                           |           NULL | 9780012345678 | A New Series                         | 2020-01-01  |     1002 | Erez Osiris        | 1990-01-01  |           0.0 | Y          |              1 |
< |     10000 | Houghton Mifflin Harcourt |       NULL | NULL                           |           NULL | 9780618968633 | The Hobbit                           | 2007-09-21  |     1000 | J. R. R. Tolkien   | 1892-01-03  |           1.5 | Y          |              1 |
< |     10002 | Pearson                |          NULL | NULL                           |           NULL | 9780133970777 | Fundamentals of Database Systems (7th Edition) | 2015-06-08 | 1007 | Ramez Elmasri      | 1973-01-01  |           5.0 | N          |              1 |
< |     10002 | Pearson                |          NULL | NULL                           |           NULL | 9780133970777 | Fundamentals of Database Systems (7th Edition) | 2015-06-08 | 1008 | Shamkant B. Navathe | 1974-01-01 |           5.0 | N          |              2 |
< |     10002 | Pearson                |          NULL | NULL                           |           NULL | 9780133544619 | Modern Database Management (12th Edition) | 2015-07-13 |     1004 | Jeffery A. Hoffer  | 1970-01-01  |          10.0 | Y          |              1 |
< |     10002 | Pearson                |          NULL | NULL                           |           NULL | 9780133544619 | Modern Database Management (12th Edition) | 2015-07-13 |     1005 | V. Ramesh          | 1971-01-01  |           2.0 | N          |              2 |
< |     10002 | Pearson                |          NULL | NULL                           |           NULL | 9780133544619 | Modern Database Management (12th Edition) | 2015-07-13 |     1006 | Heikki Topi        | 1972-01-01  |           2.0 | N          |              3 |
< |     10003 | Scribner               |          NULL | NULL                           |           NULL | 9781451664829 | The Space Trilogy                    | 2011-09-20  |     1001 | C. S. Lewis        | 1898-11-29  |          20.0 | Y          |              1 |
< |     10003 | Scribner               | 9781451664829 | The Space Trilogy              |              1 | 9780743234900 | Out of the Silent Planet             | 1996-10-01  |     1001 | C. S. Lewis        | 1898-11-29  |           5.0 | Y          |              1 |
< |     10003 | Scribner               | 9781451664829 | The Space Trilogy              |              2 | 9780743234917 | Perelandra                           | 1996-10-01  |     1001 | C. S. Lewis        | 1898-11-29  |           5.0 | Y          |              1 |
< |     10003 | Scribner               | 9781451664829 | The Space Trilogy              |              3 | 9780743234924 | That Hideous Strength                | 1996-10-01  |     1001 | C. S. Lewis        | 1898-11-29  |           5.0 | Y          |              1 |
< +-----------+------------------------+---------------+--------------------------------+----------------+---------------+--------------------------------------+-------------+----------+--------------------+-------------+---------------+------------+----------------+

--------------------------------------------------------------------
--------------------------------------------------------------------
                              Test #4
--------------------------------------------------------------------

--------------------------------------------------------------------
Checking the DROP TABLE STATEMENT (ORDER)
--------------------------------------------------------------------

Dropping and Recreating Tables ...


DROP TABLE IF EXISTS 'Volume', 'Authorship', 'Book', 'Author','Publisher';
```

```
Stopping Docker Containers...
Stopping cmpt310_www ...
Stopping cmpt310_db  ...
Stopping cmpt310_www ... done
Stopping cmpt310_db  ... done
Removing cmpt310_www ...
Removing cmpt310_db  ...
Removing cmpt310_db  ... done
Removing cmpt310_www ... done
Removing network asafari_default
Removing image asafari_db
Removing image asafari_www
```

```sql
-- FRANKLIN SAFARI
-- YOUR ID HERE
-- ------------------------------------------------------------------------------------------------------------
-- lab5.sql
-- ------------------------------------------------------------------------------------------------------------
-- The purpose of these labs is to gain experience normalizing a poorly
-- structured database from a single 1NF relation into many well structured
-- 3NF relations. You started with an 1NF table and have been provided a set
-- of 3NF relations. Your task is to create the 3NF database relations using
-- SQL DDL statements and to populate the relations with sample data from
-- the table using SQL DML statements.
--
-- To execute your script:
-- $> mysql --login-path=Lab5 Lab5 < lab5.sql


DROP TABLE IF EXISTS `Volume`, `Authorship`, `Book`, `Author`,`Publisher`;
-- ------------------------------------------------------------------------------------------------------------
-- TABLE PUBLISHER
-- ------------------------------------------------------------------------------------------------------------

  CREATE TABLE `Publisher`(
    `ID`           NUMERIC(4,0)         NOT NULL,
    `Name`         VARCHAR(25)          NOT NULL,
     CONSTRAINT PUBLISHER_PK PRIMARY KEY (`ID`));
-- ------------------------------------------------------------------------------------------------------------
```

name too small (-1)

```sql
-- ------------------------------------------------------------------------------------------------------------
-- AUTHOR TABLE
-- ------------------------------------------------------------------------------------------------------------

  CREATE TABLE `Author`(
    `ID`           NUMERIC(4,0)         NOT NULL,
    `Name`         VARCHAR(25)          NOT NULL,
     CONSTRAINT AUTHOR_PK PRIMARY KEY (`ID`));
```

name too small

```sql
-- ------------------------------------------------------------------------------------------------------------
-- BOOKS TABLE
-- ------------------------------------------------------------------------------------------------------------

  CREATE TABLE `Book`(
    `ISBN`            NUMERIC(13,0)        NOT NULL,
    `Title`           VARCHAR(25)          NOT NULL,
    `Publisher_Date`  DATE        NOT NULL,
    `Publisher_ID`    NUMERIC(4,0)         NOT NULL,
     CONSTRAINT BOOKS_PK PRIMARY KEY (`ISBN`),
     CONSTRAINT BOOKS_FK FOREIGN KEY (`Publisher_ID`) REFERENCES `Publisher` (`ID`));
```

title too small

```sql
-- ------------------------------------------------------------------------------------------------------------
-- AUTHORSHIP TABLE
-- ------------------------------------------------------------------------------------------------------------

  CREATE TABLE `Authorship`(
    `Book_ISBN`        NUMERIC(13,0)        NOT NULL,
    `Author_ID`        NUMERIC(4,0)         NOT NULL,
    `RoyaltyPercent`   DECIMAL(3,2)         NOT NULL,
    `LeadAuthor`       VARCHAR(25)          NOT NULL,
    `Position`         INT                  NOT NULL,
     CONSTRAINT AUTHORSHIP_PK PRIMARY KEY (`Book_ISBN`, `Author_ID`),
     CONSTRAINT AUTHORSHIP_FK FOREIGN KEY (`Book_ISBN`) REFERENCES `Book` (`ISBN`),
     CONSTRAINT AUTHORSHIP_FK2 FOREIGN KEY (`Author_ID`) REFERENCES `Author` (`ID`));
```

should be something like boolean (-1)

```sql
-- ------------------------------------------------------------------------------------------------------------
-- TABLE VOLUME
-- ------------------------------------------------------------------------------------------------------------

  CREATE TABLE `Volume`(
    `Series_Book_ISBN`      NUMERIC(13,0)       NOT NULL,
    `Volume_Book_ISBN`      NUMERIC(13,0)       NOT NULL,
    `Position`              NUMERIC(2,0)        NULL,
     CONSTRAINT VOLUME_PK PRIMARY KEY (`Series_Book_ISBN`, `Volume_Book_ISBN`),
     CONSTRAINT VOLUME_FK FOREIGN KEY (`Series_Book_ISBN`) REFERENCES `Book` (`ISBN`));

-- ------------------------------------------------------------------------------------------------------------
```