**CSCE 4523 Introduction to Database Management Systems**

**Spring 2025**

**Objective**

You are to implement a simple database using MySQL on turing.

**Program Description**

Create a database with the following schema (note: your attributes may be uppercase or lowercase):

**Bookstore**  
 bookstoreID    int    primary key  
 bookstoreName    char(25)    NOT NULL

state char(2) NOT NULL  
 city    char(15)    NOT NULL  
  
**Book**  
 bookID    int    primary key  
 bookName    char(25)    NOT NULL

author    char(25)    NOT NULL

publicationDate    date

type    char(3) OR ENUM    either fic (fiction) or non (non-fiction)  
  
**Copy**  
 copyID    int    primary key  
 bookstoreID    int    foreign key references Bookstore (bookstoreID)  
 bookID    int    foreign key references Book (bookID)  
 price    dec(4,2)    5 ≤ price ≤ 50       
  
**Purchase**  
 purchaseID    int    primary key  
 copyID    int    foreign key references Copy (copyID)  
 date    date    must be Jan. 1, 2025 or later  
 time    time

**Implementation**

Be sure to handle all entity integrity, referential integrity, and other constraints in your table definitions. i.e., for foreign keys, specify what to do on deletion and update.

Note: mysql does not enforce domain constraints, but include them in your definitions anyway so that, if you were to move to different database or if they were to update their implementation, your database definition would be ready to go.

*Bookstore foreign keys*

If bookstore is attempted to be deleted, that operation should be blocked/disallowed if there are any foreign keys that point to the bookstore in other tables.

Updates to the primary should propagate to any records in the dependent tableijhj.

*Book foreign keys*

If a book is deleted, all copy entries that refer to that book should have their bookID set to NULL.

Updates to the primary should propagate to the dependent records in the other tables.

*Copy foreign keys*

If a copy is deleted, any purchase of that copy should also be deleted.

Updates to the primary should propagate to the dependent records in the other tables.

Once the tables are created, insert records to match the data file.

**What to turn in**

You will create a report that includes your database create commands and a log file of your output. To create a log file, at the mysql prompt, type:

tee a3.log

Then execute the commands for the tasks below to display the results on screen. When you are done, type:

notee

This creates a file called **a3.log**.

**Tasks to include in a3.log**

**Turn tee on and run the following within mysql**

1. Show the tables that you have created. Use the command below:

SHOW TABLES;

1. Show the schema of each table. Use the command below, once per tablename:

DESC tablename;

1. Show how each table was created. Use the command below, once per tablename:

SHOW CREATE TABLE tablename;

1. Show the foreign keys of each table. Use the command (fill in your own db name):

SELECT COLUMN\_NAME, CONSTRAINT\_NAME, REFERENCED\_COLUMN\_NAME, REFERENCED\_TABLE\_NAME  
FROM INFORMATION\_SCHEMA.KEY\_COLUMN\_USAGE   
WHERE REFERENCED\_COLUMN\_NAME IS NOT NULL AND CONSTRAINT\_SCHEMA = 'your\_db';

1. Show all the records within every table. For each table, use the command:

SELECT \* FROM tablename;

**For each of the following, output the query and the results of running the query.**

1. Find and print the bookstore name and city for all bookstores that have the book “To Kill a Mockingbird”.
2. Find all copies at bookstores in Arkansas, sorted by price. Output the book name, bookstore name, city, state, and price.
3. Find and print the total number of copies and the average price of the copies for each bookstore. Output the bookstore, city, state, number of items, and average price.
4. Find and print the total price of all purchases placed from Pearl’s Books, assuming a 15% tax rate. Output the number of purchases, the average base price of each purchase (without tax), the total base price of all purchases (without tax), and total price (with tax) in the result. Note: There should be only 1 tuple in the result.
5. Find and print the total price of all purchases placed in January, assuming a 15% tax rate. Output the number of purchases, the average base price of each purchase (without tax), the total base price of all purchases (without tax), and total price (with tax) in the result. Note: There should be only 1 tuple in the result.

**Test your referential integrity constraints:**

1. Update bookstoreID from 0 to 1. Show the contents of all Bookstore and Copy after the update.
2. Delete book 9 (Brave New World). Show the contents of Book, Copy, and Purchase after the deletion.

**Turn off tee (notee).**

**Create a single report and turn in on Blackboard**

In a Word or text file, include your commands to create the tables and insert the records. Also include a3.log. Upload this single document to Blackboard.

**Grading:**

(24 points) Creating the tables with the correct constraints is worth 20 points - 6 points per table.

(8 points) - Running the SQL queries to insert data records – 2 points per table.

(30 points) – Running the queries – 6 points per query.

(8 points) – Testing update and delete – 4 points per test.

NOTE: if you do not include testing that shows you working on turing, 20% deduction (14 points)

**Where to work:** This project must be done on turing.csce.uark.edu