Books/Authors Assignment : Creating Tables using SQL

Version 1.0

You will be using your PostgreSQL installations to write a SQL script utilizing the SQL DDL commands **Drop Table** and **Create Table**, and using the SQL DML command **Insert** to populate them with data.

For reference, use the following:

- The ERD-to-Table slides on

  https://gitlab.pcs.cnu.edu/cpsc440-01-MrJohnson/database-materials/tree/master/Slides/ER_to_Tables.pptx
- W3Schools.com SQL Tutorial
- Chapter 5 in your textbook

Start postgres and pgAdmin through docker as with your previous assignment. Write all of your SQL using the Query Tool, and save your code in a file called **bookAuthors.sql**.

Your SQL file should contain the following elements in this order :

1. **DROP TABLE** commands for every table in your script. Use **IF EXISTS** and **CASCADE** for each of these to make your code resilient.
2. **CREATE TABLE** commands to produce tables meeting the requirements given below.
3. **INSERT** commands to populate tables with the rows given below.

Tables

The following tables should be created.

- Table Name (**Identifying Attribute**, Attribute, Attribute, ...)

1. Book (Title, Edition, Publisher, **ISBN**)
2. Author (**ID**,Name)
3. BookAuthor (**AuthorID, BookISBN**)

Note that *BookAuthor* is an associative entity, and also a weak entity. It has strong relationships connecting it to the other two tables.

Hint: **int** is a 32-bit number and will *not* hold an ISBN. Use **BigInt**, a 64-bit data type, or some other data type that works. **Numeric** can represent over 130000 digits!

Keys

Primary keys are in bold above. Note that BookAuthor has a *composite* or *compound* primary key.

Foreign keys are as follows :

- AuthorID is a foreign key in BookAuthor referring to the ID in Author.
- BookISBN is a foreign key in BookAuthor referring to ISBN in Book.

Data

Populate your tables with all of the data contained in the following table images :

Book:

Title	Edition	Publisher	ISBN
Object-Oriented Design and Patterns	2	Wiley	978-0471744870
Intro to Java Programming, Comprehensive Version	10	Pearson	978-0133761313
Advanced Engineering Mathematics	10	Wiley	978-0470458365
Computer Architecture	5	Elsevier Science	978-0123838728

Author:

ID	Name
1	Cay S. Horstmann
2	Y. Daniel Liang
3	Erwin O. Kreyszig
4	John L. Hennessy
5	David A. Patterson

BookAuthor:

AuthorID	BookISBN
1	978-0471744870
2	978-0133761313
3	978-0470458365
4	978-0123838728
5	978-0123838728

Note: You do not need to implement the **dash** in ISBN. You should implement this field as a 13-digit numeric.

Save all of your code in the file **bookAuthors.sql**. This must be a ***plain text file*** containing all of your SQL commands and nothing else. Code comments are fine, but they must be legal SQL syntax.

You should be able to find a plain text editor on any computer. But, if you want to teach yourself a fun and useful editor for system administration, try the command **vi** in the **Docker Quickstart Terminal** or your Mac or Linux **Terminal**. Read https://www.howtogeek.com/102468/a-beginners-guide-to-editing-text-files-with-vi/ or some similar resource to learn the basic commands (**vi bookAuthors.sql** to start, **i** to insert text, **ESC** after inserting text, **:x** to save the file).

Do ***not*** copy and paste your submission to the comments on Scholar. Do ***not*** submit Word content, RTF content, or any other markup-syntax or WYSIWYG editor content.

You should run the queries in **tests.sql**. These SQL queries will all compile and run if your schema is correct.

You should also run the queries in **checkKeys.sql**. These will ***fail*** due to key violations: that is their purpose. These failures signify that your key constraints are working. They will fail with errors similar to these:

```
psql:/sql/checkKeys.sql:4: ERROR:  null value in column "id" violates not-null
constraint
DETAIL:  Failing row contains (null, Bugs Bunny).
psql:/sql/checkKeys.sql:10: ERROR:  duplicate key value violates unique
constraint "author_pkey"
DETAIL:  Key (id)=(6) already exists.
psql:/sql/checkKeys.sql:16: ERROR:  duplicate key value violates unique
constraint "book_pkey"
DETAIL:  Key (isbn)=(1234567890123) already exists.
psql:/sql/checkKeys.sql:22: ERROR:  duplicate key value violates unique
constraint "pk"
DETAIL:  Key (authorid, bookisbn)=(1, 9780471744870) already exists.
psql:/sql/checkKeys.sql:27: ERROR:  insert or update on table "bookauthor"
violates foreign key constraint "bookauthor_authorid_fkey"
DETAIL:  Key (authorid)=(99) is not present in table "author".
```

Remember that you can run your own SQL code, then copy-and-paste the test SQL code to PgAdmin4 and run it in the same way. Your tables *persist* after running your script. You can highlight each of the test queries and run them individually.

You should **run all of the test queries** and fix **your code** if any of them do not behave as they should.