Credit Hours: 3

Contact Hours: This is a 3-credit course, offered in accelerated format. This means that 16 weeks of material is covered in 8 weeks. The exact number of hours per week that you can expect to spend on each course will vary based upon the weekly coursework, as well as your study style and preferences. You should plan to spend 14-20 hours per week in each course reading material, interacting on the discussion boards, writing papers, completing projects, and doing research.

COURSE DESCRIPTION AND OUTCOMES

COURSE DESCRIPTION:

This course covers the basics of relational databases, including basic terminology and concepts, database integrity, and normalization. The relational model will be examined in detail in order to appreciate database structure, integrity, and manipulation. Current relational database management systems will be explored and contrasted, as will basic relational database design and SQL programming.

COURSE OVERVIEW:

Decision-making is becoming increasingly a data-driven process. The futuristic concepts like AI (artificial intelligence) are a reality. It is hard to find a business or any other entity that does not utilize some form of data in daily bases. In assessing issues like risks, opportunities, competitors, growth, and acquisitions, managers and executives turn to data. To try and establish patterns and trends in fighting diseases, doctors turn to data. To predict election results, political gurus turn to data. For those reasons and many more we gather, store, structure, and manipulate data to enhance the decision-making process. A database is the core of such processes. Considering the considerable amount of data that we collect and process in databases, it is essential that we structure them in a way that it is easy to access, process, and store. Database systems take care of all those components.

In this course, we will learn some of the critical database concepts that can help a professional understand how to create a logical and physical structure for a reliable database. This course will provide some querying tools and SQL programming that will help students with building database objects like tables and queries. This course will cover some key terminology and concepts. Critical Thinking Assignments will be hands-on activities where students will create objects, run queries, and program in SQL.

COURSE LEARNING OUTCOMES:

1. Examine the relational database model and components.
2. Explain the role of primary and foreign keys in the relationships in a database.
3. Design a simple relational database from a set of user requirements in an entity/relationship diagram (ERD).
4. Utilize Structured Query Language (SQL) to create database tables, load data, create queries, and create reports.
5. Apply normalization rules to reduce redundant data.
6. Compare popular relational database management systems (RDBMS).

**PARTICIPATION & ATTENDANCE**

Prompt and consistent attendance in your online courses is essential for your success at CSU-Global Campus. Failure to verify your attendance within the first 7 days of this course may result in your withdrawal. If for some reason you would like to drop a course, please contact your advisor.

Online classes have deadlines, assignments, and participation requirements just like on-campus classes do. Budget your time carefully and keep an open line of communication with your instructor. If you are having technical problems, problems with your assignments, or other problems that are impeding your progress, let your instructor know as soon as possible.

**COURSE MATERIALS**

Textbook Information is located in the CSU-Global Booklist on the Student Portal.

**COURSE SCHEDULE**

**Due Dates**

The academic week at CSU-Global begins on Monday and ends the following Sunday.

- **Discussion Boards:** The original post must be completed by Thursday at 11:59 p.m. MT and peer responses posted by Sunday 11:59 p.m. MT. Late posts may not be awarded points.
- **Opening Exercises:** Take the Opening Exercise before reading each week’s content to see which areas you will need to focus on. You may take these exercises as many times as you need. The Opening Exercises will not affect your final grade.
- **Mastery Exercises:** Students may access and retake Mastery Exercises through the last day of class until they achieve the scores they desire.
- **Critical Thinking Assignments:** Critical Thinking Assignments are due Sunday at 11:59 p.m. MT.

**WEEKLY READING AND ASSIGNMENT DETAILS**

**Module 1**

**Readings**

- Chapters 1 & 2 in *Database Design*
- Chapters 1 & 2 in *Learning PostgreSQL 10*
Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Critical Thinking Assignment (70 points)

Option #1: Database Software Installation, Database and Table Creation and Population

In this Critical Thinking Assignment, you will install the PostgreSQL software product and create and populate the JigSaw Operational database. Follow the instructions in the assignment module folder to: 1) install PostgreSQL; 2) create the JigSaw database; 3) create the tables within the database; and 4) populate the tables with data.

Part I: Create a new database in PostgreSQL
1. Expand the PostgreSQL item on the tree listing.
2. Right-click to select the Databases item and then select Create -> Database.
3. The Create Database dialog window appears:
   • Enter js in the Database name.
   • Enter any comments you feel are appropriate.
   • Click Save. The database js now appears in the tree listing on the left side of the screen.
4. Right-click js and select Query tool.
5. Open the js.sql file using a text editor, then:
   • Select all of the SQL statements.
   • Copy and paste the SQL into the Query tool window.
   • Run the SQL.
   • Click the lightning bolt to execute the SQL script. You should receive a Query Returned Successful message.
   • Clear the Query tool window.
6. Open the js_data.sql file using a text editor, then:
   • Select all of the SQL statements.
   • Copy and paste the SQL into the Query tool window.
   • Run the SQL.
   • Click the lightning bolt to execute the SQL script. You should receive a Query Returned Successful message.
   • Clear the Query tool window.

At this point, the js database and tables are created and populated. Use these procedures and SQL scripts as an example when creating the database and tables, and when populating the databases.

Assignment Deliverables:
1. Screenshot of the PostgreSQL screen signifying a successful installation.
2. Screenshot of the Jigsaw database and populated tables signifying successful completion of the database operations.
3. A brief report describing your key learnings from this assignment.

Option #2: Database Software Installation, Database and Table Creation and Population

In this Critical Thinking Assignment, you will install the PostgreSQL software product and create and populate the Northwind database. Follow the instructions in the assignment module folder to: 1) install PostGresQL; 2) create the Northwind database; 3) create the tables within the database; and 4) populate the tables with data.
Once you have installed PostgreSQL, you will need to create a database and seed your database with data. For this assignment, you will use the Northwind database from Microsoft. To create the database, you will use the pgAdmin4 utility, which was installed in your PostgreSQL installation. If you are familiar with Microsoft SQL Server, then pgAdmin4 is similar to Microsoft SQL Server Studio Express.

- Click on or tab to the pgAdmin4 icon and press Enter to launch the application. (Note the screen shot below shows how to start pgAdmin4 in Windows 10. You may have an icon on your desktop in other versions of Windows.)

The interactive development environment should appear after a few moments.

**Seeding the Database with Data**

You will need to seed your database with data. You might use Microsoft’s Northwind database for the exercises in this class. PostgreSQL database administrative tool is named PgAdmin, and if you are familiar with Microsoft’s SQL Server Studio Express, PgAdmin works similarly. PgAdmin is found in the PostgreSQL bin folder.

1. In Windows, the folder is C:\Program Files\PostgreSQL\***version of PostgreSQL***\pgAdmin 4\bin. The executable name is pgAdmin4.exe and has the “elephant” icon. You may want to create a desktop shortcut for this program. This screen’s contents will vary based on the version you downloaded.
2. Next, you will create the database you will be using for this class. Click on or tab to the “+” next to Servers (1) and press Enter to expand the database tree. Then click on or tab to the “X” beside PostgreSQL and press Enter. This screen’s contents will vary based on the version you downloaded.

- The Postgres database tree is expanded. The version may vary after the PostgreSQL depending on the version downloaded.

3. Expand the database tree in order to create your database. Right-click on Databases (1) and select Create > Database from the menu.
4. Enter **Northwind** as the name of your database in the *Database* field. Select the Save Button.

5. Select **Northwind** under *Databases*. Under Tools in the main menu, select the *Query Tool* and press Enter. The query editor tool displays. In the query editor, copy and paste the contents of the file *northwind.postgre.sql*. 

![Image of query editor tool with sample code pasted]
6. Execute the SQL statements by clicking on or tabbing to the **lightning bolt** in the menu bar and pressing Enter. This will create and seed your tables with data.

7. Expand the **Tables** tree under the **Schemas** tree. You should see the tables of the Northwind dataset. Take a screenshot of the table structure and submit it as part of your Critical Thinking Assignment (CTA) for Module 1. Our 24/7 technical support site has a set of instructions for best practices when taking a screenshot, accessed by clicking the technical support link.

**Assignment Deliverables:**
1. Screenshot of the PostgreSQL screen signifying a successful installation.
2. Screenshot of the Northwind database and populated tables signifying successful completion of the database operations.
3. A brief report describing your key learnings from this assignment.

**Module 2**

**Readings**
- Chapter 3 in *Database Design*
- Chapters 3 & 4 in *Learning PostgreSQL 10*

**Opening Exercise (0 points)**

**Discussion (25 points)**
Mastery Exercise (10 points)

Critical Thinking Assignment (70 points)

Option #1: Relational Data Model – Order Entry

For this option, you will use the Customer, Order, and Employee tables in your Database Design text, pp. 73-74. Complete tasks 1 – 4 on page 74. You are not required to physically create the tables in PostGRESQL. Submit your deliverable in a Word document. You can use Visio, Lucid-chart, or Word to create the Relationship Diagram.

Your deliverables for this assignment are:
1. CREATE table statements for the Customer table.
2. CREATE table statements for the Employee table.
3. CREATE table statements for the Order table.
4. Relationship Diagram with primary and foreign keys and parent and child tables.
5. A brief discussion on the primary challenges, if any, you experienced in completing this assignment.

Option #2: Relational Data Model – Sales Transactions

For this option, you will use the Sales and Purchased Items tables below. You are to develop CREATE TABLE statements for both tables and develop a relationship diagram for the two tables including parent and child tables, primary and foreign keys. Submit your deliverable in a Word document. You can use Visio, Lucid-chart, or Word to create the Relationship Diagram.

Sales Table

<table>
<thead>
<tr>
<th>Last Name</th>
<th>First Name</th>
<th>Phone</th>
<th>Invoice Date</th>
<th>Invoice Item</th>
<th>Price</th>
<th>Tax</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shire</td>
<td>Robert</td>
<td>206-524-2422</td>
<td>12/14/2017</td>
<td>Antique Desk</td>
<td>3000.0</td>
<td>249.0</td>
<td>3249.0</td>
</tr>
<tr>
<td>Shire</td>
<td>Robert</td>
<td>206-524-2422</td>
<td>12/14/2017</td>
<td>Antique Desk Chair</td>
<td>500.00</td>
<td>41.50</td>
<td>541.50</td>
</tr>
<tr>
<td>Goodyear</td>
<td>Katherine</td>
<td>206-524-3544</td>
<td>12/15/2017</td>
<td>Dining Table Linens</td>
<td>1000.00</td>
<td>83.00</td>
<td>1083.0</td>
</tr>
<tr>
<td>Bancroft</td>
<td>Chris</td>
<td>426-635-9788</td>
<td>12/15/2017</td>
<td>Candles</td>
<td>50.00</td>
<td>4.16</td>
<td>54.16</td>
</tr>
<tr>
<td>Griffith</td>
<td>John</td>
<td>206-524-4656</td>
<td>12/23/2017</td>
<td>Candles</td>
<td>45.00</td>
<td>3.74</td>
<td>48.74</td>
</tr>
<tr>
<td>Shire</td>
<td>Robert</td>
<td>206-524-2422</td>
<td>1/5/2018</td>
<td>Desk Lamp</td>
<td>250.00</td>
<td>20.75</td>
<td>270.75</td>
</tr>
<tr>
<td>Tierney</td>
<td>Doris</td>
<td>425-635-8677</td>
<td>1/10/2018</td>
<td>Dining Table Linens</td>
<td>750.00</td>
<td>62.25</td>
<td>812.25</td>
</tr>
<tr>
<td>Anderson</td>
<td>Donna</td>
<td>360-538-3544</td>
<td>1/12/2018</td>
<td>Book Shelf</td>
<td>250.00</td>
<td>20.75</td>
<td>270.75</td>
</tr>
<tr>
<td>Goodyear</td>
<td>Katherine</td>
<td>206-524-3544</td>
<td>1/15/2018</td>
<td>Antique Chair</td>
<td>1250.00</td>
<td>103.7</td>
<td>1353.7</td>
</tr>
<tr>
<td>Goodyear</td>
<td>Katherine</td>
<td>206-524-3544</td>
<td>1/15/2018</td>
<td>Antique Chair</td>
<td>1750.00</td>
<td>145.2</td>
<td>1895.2</td>
</tr>
<tr>
<td>Tierney</td>
<td>Doris</td>
<td>425-635-8677</td>
<td>1/25/2018</td>
<td>Antique Candle Holders</td>
<td>350.00</td>
<td>29.05</td>
<td>379.05</td>
</tr>
</tbody>
</table>
### Purchased Items Table

<table>
<thead>
<tr>
<th>PurchaseItem</th>
<th>PurchasePrice</th>
<th>Purchase Date</th>
<th>Vendor</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antique Desk</td>
<td>1800.00</td>
<td>11/7/2017</td>
<td>European Specialties</td>
<td>206-325-7868</td>
</tr>
<tr>
<td>Antique Desk</td>
<td>1750.00</td>
<td>11/7/2017</td>
<td>European Specialties</td>
<td>206-325-7868</td>
</tr>
<tr>
<td>Antique Candle Holders</td>
<td>210.00</td>
<td>11/7/2017</td>
<td>European Specialties</td>
<td>206-325-7868</td>
</tr>
<tr>
<td>Antique Candle Holders</td>
<td>200.00</td>
<td>11/7/2017</td>
<td>European Specialties</td>
<td>206-325-7868</td>
</tr>
<tr>
<td>Dining Table Linens</td>
<td>600.00</td>
<td>11/14/2017</td>
<td>Linen and Things</td>
<td>206-325-6755</td>
</tr>
<tr>
<td>Candles</td>
<td>30.00</td>
<td>11/14/2017</td>
<td>Linen and Things</td>
<td>206-325-6755</td>
</tr>
<tr>
<td>Desk Lamp</td>
<td>150.00</td>
<td>11/14/2017</td>
<td>Lamps and Lighting</td>
<td>206-325-8977</td>
</tr>
<tr>
<td>Floor Lamp</td>
<td>300.00</td>
<td>11/14/2017</td>
<td>Lamps and Lighting</td>
<td>206-325-8977</td>
</tr>
<tr>
<td>Dining Table Linens</td>
<td>450.00</td>
<td>11/21/2017</td>
<td>Linen and Things</td>
<td>206-325-6755</td>
</tr>
<tr>
<td>Candles</td>
<td>27.00</td>
<td>11/21/2017</td>
<td>Linen and Things</td>
<td>206-325-6755</td>
</tr>
<tr>
<td>Book Shelf</td>
<td>150.00</td>
<td>11/21/2017</td>
<td>Harrison, Denise</td>
<td>425-746-4332</td>
</tr>
<tr>
<td>Antique Desk</td>
<td>1000.00</td>
<td>11/28/2017</td>
<td>Lee, Andrew</td>
<td>425-746-5433</td>
</tr>
<tr>
<td>Antique Desk Chair</td>
<td>300.00</td>
<td>11/28/2017</td>
<td>Lee, Andrew</td>
<td>425-746-5433</td>
</tr>
<tr>
<td>Antique Chair</td>
<td>750.00</td>
<td>11/28/2017</td>
<td>New York Brokerage</td>
<td>206-325-9088</td>
</tr>
<tr>
<td>Antique Chair</td>
<td>1050.00</td>
<td>11/28/2017</td>
<td>New York Brokerage</td>
<td>206-325-9088</td>
</tr>
</tbody>
</table>

Your deliverables for this assignment are:
1. CREATE TABLE statements for the Sales table.
2. CREATE TABLE statements for the Purchased Items table.
3. Relationship Diagram with primary and foreign keys and parent and child tables.
4. A brief discussion on the primary challenges, if any, you experienced in completing this assignment.

**Module 3**

**Readings**
- Chapter 5 in *Database Design*
Create the entities for an ERD model based on the traffic citation form. Use five entities and use the data items on the form to specify identifiers and attributes for those entities. In which of these entities should you place the unique Notice Number that is the unique identifier for this notice?

Complete the ERD model by specifying relationships among the entities. Name the relationships and specify the relationship types and cardinalities (i.e. one-to-one, one-to-many, or many-to-many). Justify the decisions you make regarding minimum and maximum cardinalities, indicating which cardinalities can be inferred from data on the form and which need to be checked out.
with systems users. Specify relationships among the entities. Name the relationship and give its type and cardinalities. Indicate which cardinalities can be inferred from data on the form and which need to be checked out with systems users.

- Submit your deliverable in a Word document. You can use Visio or Lucid-chart to create the Entity-Relationship Diagram.

**Option #2: Curiosity Shop Data Model**

A Curiosity Shop wants to expand its database applications beyond the current recording of sales. The company still wants to maintain data on customers, employees, vendors, sales, and items, but it wants to simplify the storage of inventory and customer and employee data.

**Sales Table**

<table>
<thead>
<tr>
<th>LastName</th>
<th>FirstName</th>
<th>Phone</th>
<th>InvoiceDate</th>
<th>Invoicetem</th>
<th>Price</th>
<th>Tax</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shire</td>
<td>Robert</td>
<td>206-524-2422</td>
<td>12/14/2017</td>
<td>Antique Desk</td>
<td>3000.00</td>
<td>249.00</td>
<td>3249.00</td>
</tr>
<tr>
<td>Shire</td>
<td>Robert</td>
<td>206-524-2422</td>
<td>12/14/2017</td>
<td>Antique Desk Chair</td>
<td>500.00</td>
<td>41.50</td>
<td>541.50</td>
</tr>
<tr>
<td>Goodyear</td>
<td>Katherine</td>
<td>206-524-3544</td>
<td>12/15/2017</td>
<td>Dining Table Linens</td>
<td>1000.00</td>
<td>83.00</td>
<td>1083.00</td>
</tr>
<tr>
<td>Bancroft</td>
<td>Chris</td>
<td>426-635-9788</td>
<td>12/15/2017</td>
<td>Candles</td>
<td>50.00</td>
<td>4.16</td>
<td>54.16</td>
</tr>
<tr>
<td>Griffith</td>
<td>John</td>
<td>206-524-4656</td>
<td>12/23/2017</td>
<td>Candles</td>
<td>45.00</td>
<td>3.74</td>
<td>48.74</td>
</tr>
<tr>
<td>Shire</td>
<td>Robert</td>
<td>206-524-2422</td>
<td>1/5/2018</td>
<td>Desk Lamp</td>
<td>250.00</td>
<td>20.75</td>
<td>270.75</td>
</tr>
<tr>
<td>Tierney</td>
<td>Doris</td>
<td>425-635-8677</td>
<td>1/10/2018</td>
<td>Dining Table Linens</td>
<td>750.00</td>
<td>62.25</td>
<td>812.25</td>
</tr>
<tr>
<td>Anderson</td>
<td>Donna</td>
<td>360-538-3544</td>
<td>1/12/2018</td>
<td>Book Shelf</td>
<td>250.00</td>
<td>20.75</td>
<td>270.75</td>
</tr>
<tr>
<td>Goodyear</td>
<td>Katherine</td>
<td>206-524-3544</td>
<td>1/15/2018</td>
<td>Antique Chair</td>
<td>1250.00</td>
<td>103.75</td>
<td>1353.75</td>
</tr>
<tr>
<td>Goodyear</td>
<td>Katherine</td>
<td>206-524-3544</td>
<td>1/15/2018</td>
<td>Antique Chair</td>
<td>1750.00</td>
<td>145.25</td>
<td>1895.25</td>
</tr>
<tr>
<td>Tierney</td>
<td>Doris</td>
<td>425-635-8677</td>
<td>1/25/2018</td>
<td>Antique Candle Holders</td>
<td>350.00</td>
<td>29.05</td>
<td>379.05</td>
</tr>
</tbody>
</table>

**Purchased Items Table**

<table>
<thead>
<tr>
<th>Purchased Item</th>
<th>PurchasePrice</th>
<th>Purchase Date</th>
<th>Vendor</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antique Desk</td>
<td>1800.00</td>
<td>11/7/2017</td>
<td>European Specialties</td>
<td>206-325-7868</td>
</tr>
<tr>
<td>Antique Desk</td>
<td>1750.00</td>
<td>11/7/2017</td>
<td>European Specialties</td>
<td>206-325-7868</td>
</tr>
<tr>
<td>Antique Candle Holders</td>
<td>210.00</td>
<td>11/7/2017</td>
<td>European Specialties</td>
<td>206-325-7868</td>
</tr>
</tbody>
</table>
Currently, each item is considered unique, which means that the item must be sold as a whole, and that multiple units of the item in stock must be treated as separate items in the ITEM table. The Curiosity Shop management wants the database modified to include an inventory system that will allow multiple units of an item to be stored under one ItemID. The system should allow for a quantity on hand, a quantity on order, and an order due date. If the identical item is stocked by multiple vendors, the item should be orderable from any of these vendors. The SALE_ITEM table should then include Quantity and ExtendedPrice columns to allow for sales of multiple units of an item.

The Curiosity Shop management has noticed that some of the fields in CUSTOMER and EMPLOYEE store similar data. Under the current system, when an employee buys something at the store, his or her data has to be reentered into the CUSTOMER table. The managers would like to have the CUSTOMER and EMPLOYEE tables redesigned using subtypes.

- Create the entities for an ERD model based on the Sales and Purchased Items tables, extending the entities to include the Inventory and Sales and Employee data requirement. Specify identifiers and attributes for all entities. Remove unnecessary attributes from the original entities as the three new entities are added.
- Draw an ERD model for the Curiosity Shop’s entities, relationships, attributes and identifiers. Use the IE Crow’s Foot ERD model for your diagrams. Justify the decisions you make regarding minimum and maximum cardinalities. Deciding on cardinalities is an important skill for data modelers.

Submit your deliverable in a Word document. You can use Visio or Lucid-chart to create the Entity-Relationship Diagram.

**MODULE 4**

**Readings**

- Chapters 7 & 8 in *Database Design*

**Opening Exercise (0 points)**

**Discussion (25 points)**

**Mastery Exercise (10 points)**

**Portfolio Milestone (70 points)**

**Option #1: Johnson Video Store**

Review the business situation documented in the Portfolio Project Option 1. Your understanding of the business situation will determine your responses to the assignment requirements for the Portfolio Milestone.

1. This assignment should be of sufficient length to clearly identify and describe all entities, including their attributes by listing them. For instance, Entity –Movie. Attributes: Movie ID, Director, Format, Genre, etc.
2. Peer Sentences and business rules should be clearly defined. Example: One customer can rent no more than three movies at a time. A customer cannot have more than one account.
3. Ensure you develop relationship sentence pairs.

Your paper should be 3-4 pages in length and conform to CSU-Global Guide to Writing and APA.

**Option #2: Hardware Store**

Review the business situation documented in the Portfolio Project Option 2. Your understanding of the business situation will determine your responses to the assignment requirements for the Portfolio Milestone.

1. This assignment should be of sufficient length to clearly identify and describe all entities, including their attributes by listing them. For instance, Entity –Tools. Attributes: Tool Id, Manufacturer, Serial Number, Suppliers, etc.
2. Peer Sentences and business rules should be clearly defined. Example: One customer can rent no more than three tools at a time.
3. Ensure you develop relationship sentence pairs.

Your paper should be 3-4 pages in length and conform to CSU-Global Guide to Writing and APA.

**Module 5**

**Readings**

· Chapters 4 & 9 in *Database Design* Reading 1
· Chapters 5 & 6 in *Learning PostgreSQL 10*

**Opening Exercise (0 points)**

**Discussion (25 points)**

**Mastery Exercise (10 points)**
Critical Thinking Assignment (70 points)

Option #1: Order Entry

Refer to Critical Thinking Assignment – Option 1 in Module 2. Your tasks begin by generating and executing the SQL statements to create the Customer, Employee, and Order tables. Next, you will develop and execute the SQL statements to populate the 3 database tables from the data in the 3 tables on pages 73-74 in the Database Design. Finally, you will write and execute queries to display the data from all attributes (columns) and tuples (rows) in the 3 database tables.

Important reminder, refer to the instructions from Module 1 for creating database. This step must be completed before you can create and populate tables within the database.

The deliverables for this assignment are:
1. Screenprint after the database is created.
2. Screenprint after the 3 database tables are created.
3. Screenprint of the query results of the contents for each table.
4. A brief description of your key learnings from this assignment.

Option #2: Sales Transactions

Refer to Critical Thinking Assignment – Option 2 in Module 2. Your tasks begin by generating and executing the SQL statements to create the Sales and Purchased Items tables. Next, you will develop and execute the SQL statements to populate the 2 database tables from the data in their respective tables in the Critical Thinking Assignment. Finally, you will write and execute queries to display all attributes (columns) and tuples (rows) in the 2 database tables.

Important reminder, refer to the instructions from Module 1 for creating database. This step must be completed before you can create and populate tables within the database.

The deliverables for this assignment are:
1. Screenprint after the database is created.
2. Screenprint after the 2 database tables are created.
3. Screenprint of the query results for each table.
4. A brief description of your key learnings from this assignment.

Module 6

Readings
- Chapters 12 and 13 in Database Design
- Chapter 8 in Learning PostgreSQL

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)
Critical Thinking Assignment (80 points)

Option #1: Star Schema – JigSaw database

Utilize the JigSaw SQL file in the assignment folder to create a Star Schema diagram. Remember, to create a Star Schema from a normalized data model, you will need to denormalize the data model into fact and dimension tables.

The diagram should contain all of the facts and dimension tables necessary to integrate the JigSaw operational database into a data warehouse. Write a brief paper describing the challenges you experienced in completing this assignment.

Option #2: Star Schema – Northwind database

Utilize the normalized Entity-Relationship Diagram in the assignment folder to create a Star Schema Diagram. Remember, to create a Star Schema from a normalized data model, you will need to denormalize the data model into fact and dimension tables.

The diagram should contain all of the fact and dimension tables necessary to integrate the Northwind operational database into a data warehouse. Write a brief paper describing the challenges you experienced in completing this assignment.

Module 7

Readings

- Chapters 14 & 15 in Database Design

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Module 8

Readings

- Chapter 16 in Database Design
- Chapter 11 in Learning PostgreSQL 10

Opening Exercise (0 points)

Discussion (25 points)

Mastery Exercise (10 points)

Portfolio Project (280 points)

Option #1: Johnson Video Store
You are a database consultant with Ace Software, Inc., and have been assigned to develop a database
for the Johnson Video Store in town. The owners have been keeping their records of videos and DVDs
purchased from distributors and rented to customers in stacks of invoices and piles of rental forms for
years. They have finally decided to automate their record keeping with a relational database.

You sit down with the owners to discuss their business and watch their operation for about a week. You
discover quickly that a video and a DVD are both copies of a movie kept in a separate plastic case that is
rented out. They have several copies of each movie they rent; therefore, there are several videos and
DVDs for each movie title. You learn that in their inventory they have several thousand videos and DVDs,
which they get wholesale from about a half dozen distributors. The video and DVD prices for them are
based on the quantity of their shipment and the past business they have done with each company.

The price of a DVD for a movie might be different from the price of a video for the same movie, even
from the same distributor. Each distributor provides different types of movies (e.g., suspense, horror,
mystery, comedy, etc.). A single distributor may provide several different types of movies in both video
and DVD format. It is possible to obtain the same movie from multiple distributors and at different
wholesale prices.

Each video and DVD has a unique identification number that the owners assign in their inventory, in
addition to the distributor’s serial number for the item. Each movie also has a unique identification
number. The owners assign in addition to the title and any movie IDs the distributors use in their
electronic catalogs. Distributors provide electronic catalogs to the owners, and the information from
these catalogs must be included in the database.

The owners need to record when a video or DVD is rented, when a video or DVD is returned, and all
customer charges such as late and damaged fees, failure to rewind fees, and taxes. They need a report
of which videos are returned late because there are standard and late charges. On occasion, there are
discount prices for specific movies or types of movies. Customers want to rent movies based on actors
or actresses, running length, type of movie, rating, year released, the director, and the Academy Awards
won (by the movie, the actors, the actresses and/or the directors). Customers also want to know how
many videos they have rented in the last month, year, and so forth. The owners need to keep only basic
information on customers in their database, such as name, address, telephone numbers, etc.

There must be no limit to the number of video and/or DVD copies of a movie that the owners can have
in their inventory. Video/DVD ID numbers, movie ID numbers, and distributor ID numbers for videos,
DVDs, and movies are all different. Also, each movie must be able to have an unlimited number of
actors, actresses, directors, and Academy Awards (i.e., Oscars). Other types of awards (e.g., Golden
Globe, People’s Choice, etc.) are not of interest for this application. The rental of equipment, sale of
videos, DVDs, popcorn, etc., is not to be kept in the database.

1. Draw an ERD utilizing a software of your choice.
2. Develop metadata from the ERD and document in an Excel spreadsheet.
3. Using PostgreSQL, develop and execute an SQL script file of DDL SQL to create the database
tables in the metadata document.
4. Using PostgreSQL, develop and execute an SQL script file of DML SQL INSERT statements to
populate the tables using SQL INSERT statements for at least 5 rows of data per table.
5. Using PostgreSQL develop and execute an SQL script file to:

   1. Show the contents of all tables
2. Retrieve all of the customers' names, account numbers, and addresses (street and zip code only), sorted by account number
3. Retrieve all of the DVDs rented in the last 30 days and sort in chronological rental date order
4. Update a customer name to change their maiden names to married names. You can choose which row to update. Make sure that you use the primary key column in your WHERE clause to affect only a specific row.
5. Delete a specific customer from the database. You can choose which row to delete. Make sure that you use the primary key column in your WHERE clause to affect only a specific row.

The metadata should be submitted in an Excel spreadsheet. All other outputs for the database design, SQL code, and SQL results should be submitted in a single Word file in order, by step, and clearly labeled. The Word file should also have a preface describing the database lifecycle steps and methodologies and a conclusion section containing lessons learned from this project.

Your paper should be 6-10 pages in length, not including the cover page and references page, and conform to *CSU-Global Guide to Writing and APA*. Include at least five credible references in addition to the course textbook. The CSU-Global Library is a good place to find these references.

**Option #2: Hardware Store**

You are a database consultant and have been hired by a small business owner to develop a database for his hardware store.

The business is a local hardware store that rents out tools.

For last year or so, the owners have been using a spreadsheet to keep track of everything, but now that business has picked up, that seems impossible.

The first order of business for you is to sit down with the owners and try to understand the business model. You ask for some existing documentations like spreadsheets, order forms, etc. During the interviews, you learn that the store has a significant number of tools from simple indoor repairs, to yard and lawn maintenance. They get tools from the following manufacturers: Bosch, Craftsman, DeWalt, Dremel, Kobalt, Makita, Milwaukee, PorterCable, Rigid, Ryobi, Stanley, Hilt, Hitachi, Husky and Bostitch.

Each tool has an identification number which is unique for the store, but it has a serial number form the manufacturer as well. They get their tools through three different suppliers (Supplier A, Supplier B and Supplier 3).

They want to make sure that they still can have an unlimited number of tools in inventory, but the customer cannot rent more than three tools at a time. Customers cannot have more than three tools in possession at any time. For instance, if a customer has already rented three tools but needs another one, he/she must return at least one to get another one. They want to make sure that system can have the tools recorded in multiple ways like by manufacturer, supplier, area of use, power system (battery, AC or fuel), price, rental fee, insurance, etc. They want to list existing customers and add new ones as they project growth.

1. Draw an ERD utilizing a software of your choice.
2. Develop metadata from the ERD and document in an Excel spreadsheet.
3. Using PostgreSQL, develop and execute an SQL script file of DDL SQL to create the database tables in the metadata document.
4. Using your PostgreSQL, develop and execute an SQL script file of DML SQL INSERT statements to populate the tables using SQL INSERT statements for at least 5 rows of data per table.
5. Using PostgreSQL develop and execute an SQL script file to:

1. Show the contents of all tables
2. Retrieve all of the customers' names, account numbers, and addresses (street and zip code only), sorted by account number
3. Retrieve all of the tools rented in the last 30 days and sort in chronological rental date order
4. Update a customer name to change their maiden names to married names. You can choose which row to update. Make sure that you use the primary key column in your WHERE clause to affect only a specific row.
5. Delete a specific customer from the database. You can choose which row to delete. Make sure that you use the primary key column in your WHERE clause to affect only a specific row.

The metadata should be submitted in an Excel spreadsheet. All other outputs for the database design, SQL code, and SQL results should be submitted in a single Word file in order, by step, and clearly labeled.

The Word file should also have a preface describing the database lifecycle steps and methodologies and a conclusion section containing lessons learned from this project.

Your paper should be 6-10 pages in length, not including the cover page and references page, and conform to CSU-Global Guide to Writing and APA. Include at least five credible references in addition to the course textbook. The CSU-Global Library is a good place to find these references.
Course Grading

20% Discussion Participation
0% Opening Exercises
0% Live Classroom
8% Mastery Exercises
37% Critical Thinking Assignments
35% Final Portfolio Project

<table>
<thead>
<tr>
<th>Grading Scale</th>
<th>Percentage Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>95.0 – 100</td>
</tr>
<tr>
<td>A-</td>
<td>90.0 – 94.9</td>
</tr>
<tr>
<td>B+</td>
<td>86.7 – 89.9</td>
</tr>
<tr>
<td>B</td>
<td>83.3 – 86.6</td>
</tr>
<tr>
<td>B-</td>
<td>80.0 – 83.2</td>
</tr>
<tr>
<td>C+</td>
<td>75.0 – 79.9</td>
</tr>
<tr>
<td>C</td>
<td>70.0 – 74.9</td>
</tr>
<tr>
<td>D</td>
<td>60.0 – 69.9</td>
</tr>
<tr>
<td>F</td>
<td>59.9 or below</td>
</tr>
</tbody>
</table>
In-Classroom Policies

For information on late work and incomplete grade policies, please refer to our In-Classroom Student Policies and Guidelines or the Academic Catalog for comprehensive documentation of CSU-Global institutional policies.

Academic Integrity
Students must assume responsibility for maintaining honesty in all work submitted for credit and in any other work designated by the instructor of the course. Academic dishonesty includes cheating, fabrication, facilitating academic dishonesty, plagiarism, reusing /repurposing your own work (see CSU-Global Guide to Writing and APA Requirements for percentage of repurposed work that can be used in an assignment), unauthorized possession of academic materials, and unauthorized collaboration. The CSU-Global Library provides information on how students can avoid plagiarism by understanding what it is and how to use the Library and Internet resources.

Citing Sources with APA Style
All students are expected to follow the CSU-Global Guide to Writing and APA Requirements when citing in APA (based on the APA Style Manual, 6th edition) for all assignments. For details on CSU-Global APA style, please review the APA resources within the CSU-Global Library under the “APA Guide & Resources” link. A link to this document should also be provided within most assignment descriptions in your course.

Disability Services Statement
CSU-Global is committed to providing reasonable accommodations for all persons with disabilities. Any student with a documented disability requesting academic accommodations should contact the Disability Resource Coordinator at 720-279-0650 and/or email ada@CSUGlobal.edu for additional information to coordinate reasonable accommodations for students with documented disabilities.

Netiquette
Respect the diversity of opinions among the instructor and classmates and engage with them in a courteous, respectful, and professional manner. All posts and classroom communication must be conducted in accordance with the student code of conduct. Think before you push the Send button. Did you say just what you meant? How will the person on the other end read the words?

Maintain an environment free of harassment, stalking, threats, abuse, insults, or humiliation toward the instructor and classmates. This includes, but is not limited to, demeaning written or oral comments of an ethnic, religious, age, disability, sexist (or sexual orientation), or racist nature; and the unwanted sexual advances or intimidations by email, or on discussion boards and other postings within or connected to the online classroom. If you have concerns about something that has been said, please let your instructor know.