PURDUE UNIVERSITY®

PURDUE POLYTECHNIC INSTITUTE
Department of Computer and Information Technology

CNIT 27200: Lab #7

25 pts

Due Date

- **Part A** is due **via Blackboard on Wednesday, April 1st, by 11:59pm**.   10 pts.
- **Part B** is due **via Blackboard on Monday, April 6th, by 11:59 p.m.**   15 pts.

PART A (10 points)

SPECIFIC LEARNING OBJECTIVES

- Use the CREATE TABLE statement to set up new tables in the database, including constraints to establish primary keys and foreign key referential integrity.
- Use the ALTER TABLE statement to add a primary key constraint and/or foreign key referential integrity to a table
- Use appropriate data types and CHECK constraints to provide domain integrity for columns of a table
- Use the DROP statement to remove tables and constraints
- Use CREATE TABLE to create a new table and populate it from data in an existing table in a single SQL statement
- Change the structure of a database table with the ALTER TABLE command
- Use some of the data dictionary views provided with the Oracle DBMS

Submission Instructions:

Your PART A answer template should follow a standard format, to be compiled in a .sql file with your name in the file as **studentnameLab7A.sql**. This is for saving your FINAL SQL statements and the output. Fill in the header information and insert the question number to separate the responses – we will be using comments to store all our non-statement content such as question numbers, results, etc.

You can comment in SQL by beginning the line with a --

Alternatively, for multi-line comments, surround the block by /* and */.

The following is a template:

```
/* <Begin Comment>
```

```
Your Name
CNIT 27200 Spring 2020
Lab Time:
Duration:
***************************************************
Question 1
<End comment> */
Select * from ...


/* Results:
     <paste table output>


   Explanation: In this query...
*/
/*
***************************************************
Question 2 */
```
etc.

Note: If you create a table that you don't want, you can use the DROP TABLE
command to delete it:

DROP TABLE *tablename* **cascade constraints;**

This is an <u>individual</u> assignment, not collaborative or cooperative with other students.

Question 1. Table: S20TRAINER

A) Code and execute a DDL statement which creates a table named S20TRAINER, with five attributes: TrainerID, LastName, FirstName, CertificationDate, BirthDate, and EmailAddr.

    a. Set the attribute TrainerID as the primary key.

    b. Use reasonable datatypes and sizes, except make the TrainerID a fixed character with a length of 9.

B) Using ALTER TABLE, alter the table by adding another attribute - Branding. Make the Branding attribute a variable character datatype with a length of 50.

C) Run a description of the S20TRAINER table (use the DESCRIBE command).

D) Drop the table.

Question 2. Table: S20ZIPCODE

A) Using one SQL statement, create AND POPULATE a table called S20ZIPCODE containing columns ZipCode, City and State.

Follow these steps to walk through this SQL statement:

Step 1: Use the "Create Table" format to create the table directly from the existing structure and data (see lecture slides on DDL).

Type the following on line 1:

CREATE TABLE S20ZIPCODE AS

Step 2: Then use **UNION** to bring together the data from the four source tables (remember that UNION eliminates duplicates). Use the tables from SUPPLIER, EMPLOYEE, CUSTOMER, and SHIPMENT.

Type the following on line 2:

SELECT PostalCode as ZipCode, City, State FROM Supplier
  UNION
SELECT PostalCode as ZipCode, City, State FROM Employee
  UNION
SELECT PostalCode as ZipCode, City, State FROM Customer
  UNION
SELECT ShipPostalCode as ZipCode, ShipCity, ShipState FROM Shipment

Notice the following details in the create table and union above:

    a. For each PostalCode from each table, use a column alias of ZIPCODE.
    b. The PostalCode in the Shipment table is ShipPostalCode
    c. You have now created a new table, called S20ZIPCODE from existing data in the database. This would realistically only be used for temporary purposes as the data is now redundant in the database.

B) Provide the <u>count</u> of the number of rows in the new S20ZipCode table. There should be a count of 312 rows.

C) List the zipcode, city, and state from your newly created table for the state of New York (**NY**). 13 rows selected.

This lab will create the tables for a database that stores information about University employees that rent University owned vehicles.

Question 3. Table: S20DRIVER

    A.   Create a table named S20DRIVER with the following columns and constraints:

Column	Datatype/Size	Constraints
DriverID	Char(8)	Primary Key (S20DRIVER_PK)
FirstName	VarChar2(30)	
LastName	VarChar2(30)	
Birthdate	Date	Require this field
LicenseNum	Char(16)	This field must be UNIQUE
LicenseDate	Date	
City	VarChar2(20)	
State	Char(2)	
Phone	Char(10)	Require this field

    B.   Do a DESCRIBE on S20DRIVER to confirm your DDL was successful.

    C.   To confirm the constraints, list the Constraint_Name, Constraint_Type, Status and Search_Condition from the USER_CONSTRAINTS Oracle table where the Table_Name = 'S20DRIVER'. Review the difference between a constraint that you have named versus a constraint that is named automatically by Oracle. What do each of the Constraint Type values mean?

Question 4. A) Add a new column named Email to S20DRIVER. Use a variable character datatype.

    B) Describe S20DRIVER. (DESCRIBE to show table structure.)

Question 5. Table: S20DEPARTMENT

    A) Code and execute a DDL statement which creates a table named S20DEPARTMENT, with four attributes: DeptCode, DeptName, Building, DeptHead. Set the DeptCode as the primary key (use S20DEPT_PK as the constraint name). Use reasonable datatypes and sizes, except make the DeptCode a fixed character with a length of 4 and make the DeptHead attribute **required and unique**.

    B) Run a description of the table (use the DESCRIBE command).

Question 6. Add DeptCode as a Foreign Key to S20DRIVER. First using ALTER TABLE, add DeptCode to S20DRIVER using the same datatype and size as in the parent table. Then add a constraint called S20Driver_FK establishing referential integrity between the DeptCode in the S20DRIVER (child) table and the S20DEPARTMENT (parent) table. This is a non-identifying relationship.

Describe S20DRIVER. (DESCRIBE to show table structure.)

Question 7. Table: S20SERVICE

A) Code and execute a DDL statement which creates a table named S20SERVICE, with four attributes: DriverID, ServiceDate, ServiceFee, and Reason. Set the DriverID and ServiceDate as the composite primary key as this is an identifying relationship (use S20SERV_PK as the constraint name). Use reasonable datatypes and sizes.

B) Add a constraint called S20SERV_FK establishing referential integrity between the DriverID in the S20DRIVER (parent) table and the S20SERVICE (child) table.

C) Run a description of the table (use the DESCRIBE command).

Question 8. Add a check constraint named SERVICE_CK to S20SERVICE.

- Use a CHECK constraint to limit the domain of the ServiceFee column to **greater than zero**.

Question 9. **A)** Using the USER_CONSTRAINTS Oracle table, list the Constraint_Name, Table_Name and Status from the USER_CONSTRAINTS view where the Constraint_Type = 'P' (i.e., Primary Key). Copy and paste the last ten lines to your document.

B) List the Constraint_Name, Table_Name, R_Constraint_Name and Status from the USER_CONSTRAINTS view where the Constraint_Type = 'R' (i.e., Foreign Key). The R_Constraint_Name is the parent's constraint name. Copy and paste the last ten lines to your document.

Question 10. **Drop S20ZIPCODE, S20DEPARTMENT, and S20SERVICE from the database**. Cascade the constraints. Show the SQL statement to drop the 3 tables.

DROP TABLE tablename CASCADE CONSTRAINTS;

{Leave S20DRIVER intact as you will use it in Part B}

PART B (15 points)

SPECIFIC LEARNING OBJECTIVES

- Use the CREATE TABLE statement to set up new tables in the database, including constraints to establish primary keys and foreign key referential integrity.
- Use the ALTER TABLE statement to add a primary key constraint and/or foreign key referential integrity to a table
- Use appropriate data types and CHECK constraints to provide domain integrity for columns of a table.
- Use the DROP statement to remove tables and constraints.
- Use CREATE TABLE to create a new table and populate it from data in an existing table in a single SQL statement
- Change the structure of a database table with the ALTER TABLE command
- Use some of the data dictionary views provided with the Oracle DBMS.

Submitting the Lab File:

Use same answer template from previous labs. Check the formatting of your **studentnameLab7B.sql** file. If the outputs are wrapping around, reduce the margins and use font size when necessary. To line up the output columns, change the font of the whole document to Courier New. Please use a simple text editor instead of MS Word due to formatting.

Note: Establish the primary keys, referential integrity constraints and domain integrity constraints during the table creation only if indicated in the constraints column. Show all SQL statements on your output document.

SHOW ALL OF YOUR WORK FOR EACH STEP IN PART B

As a reminder, this is an <u>individual</u> assignment, not collaborative or cooperative with other students.

Question 1.

A. **DROP** and then **Create** a new table named S20VIOLATIONCODE. Use the following information to create the table:

Column	Datatype/Size	Constraints
ViolationCode	Char(8)	Primary Key (S20VIOLATION_PK)
Description	VarChar2(30)	Required
Points	Number(3)	Required
Limitations	VarChar2(30)	Required

B. Do a Describe on S20VIOLATIONCODE to confirm your DDL was successful.
C. Explain the syntax for creating a new table. Describe each section.

Question 2. (Worth 3 Points)

A. Now **CREATE** a table named **S20DRIVERVIOLATION** using the following requirements.

Column	Datatype/Size	Constraints
DriverID	Char(8)	Foreign key references to the S20DRIVER table. (use constraint name: S20DRIVER_DV_FK)
ViolationCode	Char(8)	Foreign key references to the S20VIOLATIONCODE table. (use constraint name: S20VIOL_DV_FK)
VCDate	Date	
Outcome	Varchar2(10)	
Decision	Varchar2(30)	Required
Feedback	Varchar2(30)	Required
Primary Key is a composite PK: DriverID, ViolationCode, VCDate		

A) Create the table. Add the PK and FK references at the end of the create table.

B) DESCRIBE the S20DRIVERVIOLATION table and show the results.

C) What are the different ways to set up a Primary Key? How do you determine the method to use?

D) Is this an identifying or non-identifying relationship? Explain.

Question 3.

A) **Create Table: S20VEHICLE**

Column	Datatype/Size	Constraints
VIN	Char(17)	Primary Key – appropriate constraint name
Make	Varchar2(10)	Required
Model	Varchar2(20)	
Year	Char(4)	Required
Color	Varchar2(10)	
CarValue	Number(4,2)	
Insurance	Varchar2(20)	

A) Create the table.
B) DESCRIBE the S20VEHICLE table and show the results.
C) After the table is created, use ALTER TABLE to modify the datatype size of the CarValue to Number(9,2).
D) After the table is created, use ALTER TABLE to remove the Insurance column.
E) DESCRIBE the S20VEHICLE table and show the results again.
F) What is the importance of a datatype when creating a table?

Question 4. (Worth 3 points)

A) Add **Table: S20VEHICLEDRIVER**

Column	Datatype/Size	Constraints
DriverID	Char(8)	
DateDriven	Date	
VIN	Char(17)	
GasPayment	Varchar2(7)	Use the CHECK clause to limit GasPayment to: **Credit, Debit, PayPal, Transfer, Cash**
Distance	Number(4,2)	Required
ReturnDate	Date	

B) Create the table and assign constraint names as needed.
C) DESCRIBE the S20VEHICLEDRIVER table and show the results.
D) Using ALTER TABLE, add a constraint to establish **DriverID, DateDriven and VIN** as the composite primary key for the table.
E) Using ALTER TABLE, add the foreign key constraints for DriverID and VIN.
F) DESCRIBE the S20VEHICLEDRIVER table again after altering table.
G) What does the DESCRIBE command tell you about a newly created table?
H) Is this an identifying or non-identifying relationship?

Question 5. To confirm the constraints:

1. List the Constraint_Name, Constraint_Type, Status and Search_Condition from the USER_CONSTRAINTS Oracle table for each of the tables created. (Same as Part A question 3C)
2. This includes the following tables:
    a. S20DRIVER, S20DRIVERVIOLATION, S20VIOLATIONCODE, S20VEHICLEDRIVER, S20VEHICLE
3. Why is it important to use a <u>standard naming convention</u> for constraint names?

Question 6. Remove the following tables from the database.

1. **Cascade the constraints when removing the tables**.
2. Show the SQL statements to remove each of these tables:
    a. S20DRIVER, S20DRIVERVIOLATION, S20VIOLATIONCODE, S20VEHICLEDRIVER, S20VEHICLE
3. Explain how to drop a table. Why would you add this command to the beginning of a script for creating tables?

Question 7 (worth 5 points). Select two related entities from your team project. Create both tables with the proper PK, FK (review how to make the relationship identifying or non-identifying), and domain constraints. Use the selected datatypes from your 1st Phase submission. In the explanation of this question, describe the two tables, and how they are related. Is the relationship identifying or non-identifying? Which of the attributes are required? *****<u>NOTE: This is individual work. Do not use the same entities as your teammates.</u>**

Why did you select these two tables? Provide details about the importance of these two tables in your database. What are their functions?

Include your Team Number as well.