Course Code: BCA-306
Total Contact Hours: 48 hrs. (60 Lectures)

Course Title: Lab Course II
Total Credits: 04 Total Marks:100

To conduct practicals following is the list of sample assignments. Note that, these are only the sample assignments .Teacher may conduct practical's by preparing similar type of examples

Sample Assignments

Consider the following databases:

Bank database

Consider the following database maintained by a Bank. The Bank maintains information about its branches, customers and their loan applications.

Following are the tables:

BRANCH (BID INTEGER, BRNAME CHAR (30), BRCITY CHAR (10))

CUSTOMER (CNO INTEGER, CNAME CHAR (20), CADDR CHAR (35), CITY (20))

LOAN_APPLICATION (LNO INTEGER, LAMTREQUIRED

MONEY, LAMTAPPROVED MONEY, L_DATE DATE) The

relationship is as follows:

BRANCH, CUSTOMER, LOAN_APPLICATION are related with ternary

relationship. TERNARY (BID INTEGER, CNO INTEGER, LNO INTEGER).

Student- Teacher database

Consider the following database maintained by a college. It gives information about students and the teachers along with the subject taught by the teacher and the marks obtained by the student in the subject.

Following are the tables:

STUDENT (SNO INTEGER, S_NAME CHAR(30), S_CLASS

CHAR(10), S_ADDR CHAR(50))

TEACHER (TNO INTEGER, T_NAME CHAR (20),

QUALIFICATION CHAR (15), EXPERIENCE INTEGER) The

relationship is as follows:

STUDENT-TEACHER: M-M with descriptive attribute as subject name and marks.

Person–Area Database

Consider the relation Person (pnumber, pname, birthdate, income), Area (aname,

area_type). An area can have one or more persons living in it, but a person belongs

to exactly one area. The attribute 'area_type' can have values either 'urban' or

'rural'. Create the relations accordingly, so that the relationship is handled properly and the relations are in normalized form (3NF). Insert sufficient number of appropriate records.

Movie Database

Movies(M_name, release_year, budget)

Actor(A_name, role, charges, _address)

Producer(producer_id, name, P_address)

Each actor has acted in one or more movies. Each producer has produced many movies and each movie can be produced by more than one producers. Each movie has one or more actors acting in it, in different roles.

Create the relations accordingly, so that the relationship is handled properly and the relations are in normalized form (3NF). Insert sufficient number of appropriate records.

Project-Employee database

Consider the database maintained by a company which stores the details of the projects assigned to the employees.

Following are the tables:

PROJECT (PNO INTEGER, P_NAME CHAR(30),
PTYPE CHAR(20),DURATION INTEGER)

EMPLOYEE (ENO INTEGER, E_NAME CHAR(20), QUALIFICATION CHAR (15), JOINDATE DATE)

The relationship is as follows:

PROJECT-EMPLOYEE:M-M Relationship, with descriptive attributes as start_date (date), no_of_hours_worked (integer).

Business trip database that keeps track of the business trips of salesman in an office. Salesman (sno integer, s_name char (30), start_year integer, deptnoVarchar(10))

Trip(tno integer, from_citychar (20), to_citychar (20),departure_date date, return_date date)

Dept(deptnovarchar (10), dept_name char(20)) Expense(eid integer, amount money)

The relation between Dept-Salesman is One to Many

The relation between Salesman-Trip : 1 to M

The relation between Trip-Expense : 1 to 1

Bus transport Database.

Bus (bus_no int , capacity int , depot_name varchar(20))

Route(route_no int, source char(20), destination char(20), No_of_stations int)

Driver(driver_no int, driver_name char(20), license_no int, address Char(20), d_age int, salary float)

Bus_Route : M-1 and Bus_Driver : M-M with descriptive attributes date of duty allotted and shift can be1(Morning)or 2 (Evening).

Constraints:1.License_no is unique. 2. Bus capacity is not null.

Student –Marks database

Student(rollno integer, name varchar(30), address varchar(50), class varchar(10))

Subject (scode varchar(10), subject_name varchar(20))

Student-Subject are related with M-M relationship with attributes marks_scored.

Data Warehouse database.

CITIES(CITY CHAR(20),STATE CHAR(20))

WAREHOUSES(WID INTEGER,WNAME CHAR(30),LOCATION CHAR(20))

STORES(SID INTEGER,STORE_NAME CHAR(20), LOCATION_CITYCHAR(20))

ITEMS(ITEMNO INTEGER,DESCRIPTION TEXT,WEIGHT DECIMAL(5,2), COST DECIMAL(5,2))

CUSTOMER(CNOINTEGER, CNAME CHAR(50),ADDR VARCHAR(50), CU_CITY CHAR(20))

ORDERS(ONOINT,ODATE DATE)

The relationship is as follows

CITIES-WAREHOUSES 1 TO M

WAREHOUSES-STORES 1 TO M

CUSTOMER– ORDERS 1 TO M

ITEMS– ORDERS M TO M relationship with descriptive attribute ordered_quantity

STORES-ITEMS M TOM RELATION with descriptive attribute quantity

Assignment 1: Bank Database

Bank database

Consider the following database maintained by a Bank. The Bank maintains information about its branches, customers and their loan applications. Following are the tables:

BRANCH (BID INTEGER, BRNAME CHAR (30), BRCITY CHAR (10))

CUSTOMER (CNO INTEGER, CNAME CHAR (20), CADDR CHAR (35), CITY (20))

LOAN_APPLICATION (LNO INTEGER,LAMTREQUIRED MONEY, LAMTAPPROVED MONEY, L_DATE DATE)

The relationship is as follows:

BRANCH, CUSTOMER, LOAN_APPLICATION are related with ternary relationship.

TERNARY (BID INTEGER, CNO INTEGER, LNO INTEGER).

Nested Queries

Solve the Queries

1. Find the names of the customers for the “M.G.ROAD” branch.
2. List the names of the customers who have received loan less than their requirement.
3. Find the maximum loan amount approved.
4. Find out the total loan amount sanctioned by “Camp” branch.
5. Count the number of loan applications received by “M.G.ROAD” branch.
6. List the names of the customer along with the branch names who have applied for loan in the month of September.

Views:

1. Create a view which contains the details of all customers who have applied for a loan more than Rs.500000.
2. Create a view which contains details of all loan applications from the ‘Shivajinagar’ branch.
3. Write the following Queries, on the above created views :

a. List the details of customers who have applied for a loan of Rs. 500000.

b. List the details of loan applications from ‘Shivajinagar’ , where loan amount is>Rs 50000.

c. List the details of Loan applications, with the same loan amount.

Stored Functions:

1.Write a function that returns the total number of customers of a particular branch.

(Accept branch name as input parameter.)

2. Write a function to find the maximum loan amount approved.

Errors and Exceptions:

1. Write a stored function to print the total number of customers of a particular branch. (Accept branch name as input parameter.) In case the branch name is invalid, raise an exception for the same.

2. Write a stored function to increase the loan approved amount for all loans by 20%. In case the initial loan approved amount was less than Rs 10000, then print a notice to the user, before updating the amount.

Triggers

1. Write a trigger before deleting a customer record from the customer table. Raise a notice and display the message “customer record is being deleted”

2. Write a trigger to ensure that the loan amount entered for a customer of ‘Shivajinagar’ branch is never < 1000 and greater than 1000000.

Assignment 2: Student-Teacher Database

Student- Teacher database

Consider the following database maintained by a college. It gives the information about students and the teachers along with the subject taught by the teacher and the marks obtained by the student in the subject.

Following are the tables:

STUDENT (SNO INTEGER, S_NAME CHAR(30), S_CLASS CHAR(10), S_ADDR

CHAR(50))

TEACHER (TNO INTEGER, T_NAME CHAR (20), QUALIFICATION CHAR

(15), EXPERIENCE INTEGER)

The relationship is as follows:

STUDENT-TEACHER: M-M with descriptive attribute as subject name and marks.

Nested Queries

Solve the queries

1. Find the minimum experienced teacher.

2. Find the number of teachers having qualification “Ph. D.”.

3. List the names of the students taught by “Mr. Kumar” along with the subjects taught.

4. Find the subjects taught by each teacher.

5. List the names of the teachers who are teaching to a student named “Suresh”.

6. List the names of all teachers along with the total number of students they are teaching.

7. Find the student having maximum marks in the subjects taught by “Mr. Kumar”.

Views

1. Create a view containing details of all the teachers teaching the subject ‘Mathematics’.

2. Create a view to list the details of all the students who are taught by a teacher

having experience of more than 3 years .

3. Write the following Queries, on the above created views :

a. List the name of the most experienced teacher for “Mathematics”.

b. List the names of students of ‘S.Y.B.C.A.’ class, who are taught by a teacher

having more than 3 years experience.

Stored Functions

1.Write a function to accept teacher name as input and returns the number of students taught by the teacher.

2.Write a function to accept name of subject and count the number of teachers who teach that subject.

3.Write a function to accept student name and calculate the total marks obtained by that student.

Cursors

1.Write a stored function using cursors to accept student name from the user and find the names of all teachers and subjects taught to the student.

2.Write a stored function using cursors which will calculate total number of subjects taught by each teacher.

Errors and Exceptions

1. Write a stored function to accept teacher name as input parameter and print the total number of students taught by the teacher. In case the teacher name is invalid, raise an exception for the same.
2. Write a stored function to increase the marks of each student to 40 if the marks are between 35 and40 .Print a notice to the user, before updating the marks.

Triggers

1. Write a trigger before deleting a student record from the student table. Raise a notice and display the message “student record is being deleted”

2. Write a trigger to ensure that the marks entered for a student, with respect to a subject is never < 0 and greater than 100.

Assignment 3: Movie Database

Q1.Consider the following Movie database.

Movies (m_name varchar (25), release_year integer, budget money)

Actor (a_name char (30),role char (30), charges money, a_address varchar (30))

Producer(producer_id integer, name char (30), p_address varchar (30))

Each actor has acted in one or more movies. Each producer has produced many movies and each movie can be produced by more than one producers. Each movie has one or more actors acting in it, in different roles.

Create the above database in PostGreSQL.

Execute the following queries in PostGreSQL

1) List the names of actors who have acted in at least one movie, in which Mr. Khan has acted.
2) List the names of the actors and their movie names.
3) List the names of movies whose producer is "Mr. Khan"
4) List the names of the movies with the highest budget.
5) List the names of movies released after 2000.
6) List the names of actors who played the role of 'Villan'.
7) List the names of actors who are given the maximum charges for their movie along with movie name & release year.
8) Display count & total budget of all movies released in year 2014.

Cursor and triggers

1. Write a trigger before inserting into a movie table to check budget. Budget should be minimum 50 lakh. Display appropriate message.

2. Write a stored function using cursors to display the names of actors who have acted in the maximum number of movies.

Stored functions

1. Write a function to list movie-wise charges of 'Amitabh Bachchan'
2. Write a stored function to accept producer name as input and print the names of movies produced by him/her.. Also print the total number of actors in that movie.
3. Write a stored function to accept movie name as input and print the names of actors working in the movie.

View

1) List the names of producers who produce the same movie as 'Mr. Karan Johar' has produced.

2) List the names of actors who do not live in Mumbai or Pune city.

3) List the actors in each movie.

Exception

1. Write a stored function to accept movie name as input and print the names of actors working in the movie.Also print the total number of actors working in that movie. Raise an exception for an invalid movie name.
2. Write a stored function to accept producer name as input and print the names of Movies produced by him/her..Also print the total number of actors in that movie. Raise an exception for an invalid producer name.

Assignment 4: Business Trip Database

Q1.Consider the following Business trip database that keeps track of the business trips of salesman in an office.

Salesman (sno integer, s_name char (30), start_year integer, deptno Varchar(10))

Trip(tno integer, from_city char (20), to_city char (20),departure_date date, return_date date)

Dept (deptno varchar (10), dept_name char(20))

Expense(eid integer, amount money)

The relation between Dept-Salesman is One to Many

The relation between Salesman-Trip : 1 to M

The relation between Trip-Expense : 1 to 1

Create the above database in PostGreSQL.

Query

Execute the following queries in PostGreSQL

1. Give the details for trips that exceed Rs. 10,000 in expenses.
2. Increase the expenses of all the trips by Rs. 5000.
3. Give the details of salesmen who started working before 2000.
4. List the salesmen whose names start with 'A'.
5. List the salesman numbers and names of the salesmen who made trips to Calcutta.
6. Find the departments from which the salesmen have done highest number of trips.
7. Find the total expenses incurred by the salesman "Mr. Patil".
8. List the names departments, that have salesman, who have done maximum numbers of trips.

Cursor and trigger

1. Write a cursor to list all salesman's name, his trip details &expenses.
2. Write a stored function using cursors to display the details of a salesman information. ,(Accept salesman name as input parameter).
3. Write a trigger before inserting into a trip table to check departure date. 'departure date' should be always>current date . Display appropriate message.

4. Delete all the trips made by department “computer” having expenses more than Rs.15000

Stored Procedure

1. Write a function to find a business trip having maximum expenses.

2. Write a function to count the total number of business trips from ‘Pune’ to ‘Mumbai’.

3. Write a stored function to accept department name as input and print the names of salesmen working in the department. Also print the total number of trips of those salesmen.

4. Write a function to list the salesman numbers and names who made trips to Calcutta.

view

1.List the names of departments that have salesmen, who have done maximum number of trips.

2. Find the total expenses incurred by the salesman “_”.

3. Create a view to list the details of all salesman from ‘Western’ department.

4. Create a view to list all salesman’s name his trip details and his expenses for the trip.

5. Write the following Queries, on the above created views :

6. List the details of salesmen from ‘Western’ department, whose start year is 2005.

7. List the names of salesmen from ‘Western’ department, for whom their total

trip expense is >Rs 100000.

8. List the names of salesmen who have gone on a trip to “Mumbai” city.

Exception

1. Write a stored function to accept department name as input and print the names of salesmen working in the department. Also print the total number of trips of those salesmen. Raise an exception for an invalid department name.

2. Write a stored function to accept the trip_no and departure date and print its expenses. Raise an exception in case of invalid trip number.

Assignment 5: Bus Transport Database

Q1.Consider the following Bus transport Database.

Bus (bus_no int , capacity int , depot_namevar char(20))

Route(route_no int, source char(20), destination char(20), No_of_stations int)

Driver(driver_no int, driver_name char(20), license_no int, address Char(20), d_age int, salary float)

Bus_Route : M-1 and Bus_Driver : M-M with descriptive attributes date of duty allotted and shift can be 1(Morning)or 2 (Evening).

Constraints:1.License_no is unique. 2. Bus capacity is not null.

Create the above database in PostGreSQL.

Query

Execute the following queries in PostGreSQL

1. Find out the name of the driver having maximum salary.
2. Delete the record of bus having capacity< 10
3. Increase the salary of all drivers by5% if driver's age > 45.
4. Find out the route details on which buses of capacity20 run.
5. Print the names &license nos. of drivers working on in both shifts.
6. Print the names of drivers working in both shifts on .

Cursor and Trigger:

1. Define a trigger after insert or update the record of driver if the age is between 18 and 50 give the message "valid entry" otherwise give appropriate message.

2. Define a trigger after delete the record of bus having capacity< 10. Display the message accordingly.

3. Define a trigger after insert or update the record of driver if the age is between18

& 50 give the message "valid entry" otherwise give appropriate message.

4.Write a stored function using cursors to display the details of a driver.(Accept

driver name as input parameter).

Stored function

1. Write a stored function to print the names of drivers working on both shifts on '20/04/2014'.
2. Write a stored function to display the details of a driver. (Accept driver name as input parameter).
3. Write a function to accept the bus_no, date & print its allotted driver.

View

1. which contains details of bus no 101 along with details of all drivers who have driven that bus.
2. To display the details of the buses that run on routes 1or 2.
3. To find out the name of the driver having maximum salary.
4. To accept the bus_no and date and print its allotted driver.

Exception

1. Define a trigger after insert or update the record of driver if the age is between 18 and 45 give the message “valid entry” otherwise raise exception.
2. Write a stored function to accept the bus_no and date and print its allotted drivers. Raise an exception in case of invalid bus number.

Assignment 6: Student-Marks Database

Q1.Consider the following Student –Marks database

Student(rollno integer, name varchar(30), address varchar(50), class varchar(10))

Subject (scode varchar(10), subject_name varchar(20))

Student-Subject are related with M-M relationship with attributes marks_scored.

Create the above database in PostGreSQL.

Query

Execute the following queries in PostGreSQL

1. Display the names of students scoring the maximum total marks.
2. List the distinct names of all the subjects.
3. Display class wise &subject wise student list.

Curser and triggers

1. Write a stored function using cursors, to accept a address from the user and display the name, subject and the marks of the students staying at that address.
2. Write a stored function using cursors which will calculate total and percentage of each student.
3. Write a trigger before deleting a student record from the student table. Raise a notice and display the message "student record is being deleted"
4. Write a trigger to ensure that the marks entered for a student, with respect to a subject is never < 10 and greater than 100.

Stored function

1. Write a stored function using cursors to accept an address from the user & display the name, subject& the marks of the student staying at that address.

View

1. To list student name, class &total marks scored by each student ,sorted by student name.
2. To list student names along with subject name and marks who scored more than 40 marks.
3. Containing all the details of student named 'Omkar'.

Assignment 7: Warehouse Database

Q1. Consider the Warehouse database.

CITIES(CITY CHAR(20),STATE CHAR(20))
WAREHOUSES(WID INTEGER,WNAME CHAR(30),LOCATION CHAR(20))
STORES(SID INTEGER,STORE_NAME CHAR(20), LOCATION_CITY CHAR(20))
ITEMS(ITEMNO INTEGER,DESCRIPTION TEXT,WEIGHT DECIMAL(5,2), COST DECIMAL(5,2))
CUSTOMER(CNO INTEGER, CNAME CHAR(50),ADDR VARCHAR(50), CU_CITY CHAR(20))
ORDERS(ONO INT,ODATE DATE) The relationship is as follows
CITIES-WAREHOUSES 1 TO M

WAREHOUSES-STORES 1 TO M

CUSTOMER– ORDERS 1 TO M

ITEMS– ORDERS M TO M relationship with descriptive attribute ordered_quantity

STORES-ITEMS M TOM RELATION with descriptive attribute quantity

Query

Solve the following queries.

1. Find the item that has minimum weight.
2. Find the different warehouses in “Pune”.
3. Find the details of items ordered by a customer “Mr. Patil”.
4. Find a Warehouse which has maximum stores.
5. Find an item which is ordered for minimum number of times.
6. Find the details orders given by each customer.

Cursers and triggers:

1. Write a stored function using cursors to accept a city from the user and to list all warehouses in the city.
2. Write a stored function using cursors to find the list of items whose cost is between Rs.5000 to 10000

Views:

1. Create a view containing details of all the stores of a Warehouse named ’Spares’.
2. Create a view to list the details of all customers who have placed orders on the date ’03-10-2013’ .
3. ‘List the names of stores of ‘Spares ’ warehouse, located at Pune.
4. List the names of customers from Pune city, who have placed orders on 03-10-2013
5. List the orders placed by “Mr. Joshi”.