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Department of Computer Science

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M.Sc. (Computer Application) Sem I

Subject: Database Systems and SQL

Practical Assignment 5

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Note: - 1. Read the questions carefully and insert data in the database accordingly.
2. Insert sufficient number of records in the database.
3. Count queries output should be more than 2 records. (If asked)
4. No query should generate empty output.

Q.1) Create the following database in 3NF using PostgreSQL.

Consider the following Bank database which maintains information about its branches, customers and their loan applications.

Branch (Bid integer, brname varchar (30), brcity varchar (10))

Customer (Cno integer, cname varchar (20), caddr varchar (35), city varchar (15))

Loan_application (Lno integer,l_amt_required money,lamtapproved money, l_date date)

Relationship:

Branch, Customer, Loan_application are related with ternary relationship as follows:

Ternary (Bid integer, Cno integer, Lno integer)

Constraints: Primary key, l_amt_required should be greater than zero.

Draw ER diagram and Normalization diagram for above relational schema.

Using above database solve the following questions.

A. Write a stored function to count number of customers of particular branch. (Accept branch name as an input parameter).
B. Write a trigger to validate the loan amount approved. It must be less than or equal to loan amount required. Display appropriate message.

Q.2) Create the following database in 3NF using PostgreSQL.

Consider the following database of Bus-Transport System. Many buses run on one route. Drivers are allotted to buses shift-wise.

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

Route (Route_no int, source varchar (20), destination varchar (20), no_of_stations int)

Driver (Driver_no int, driver_name varchar (20), license_no int, address varchar (20), age int , salary float)

Relationship:

Bus and Route related with many to one relationship.

Bus and Driver related with many to many relationship with descriptive attributes, Shift – it can be 1 (Morning) or 2 (Evening) and Date_of_duty_allotted.

Constraints: Primary key, License_no must be unique, Bus capacity should not be null.
Draw ER diagram and Normalization diagram for above relational schema.

Using above database solve the following questions.

A. Write a trigger before inserting the driver record in driver table, if the age is not between 21 and 30, then display error message 'Invalid Age'.
B. Write a stored function to accept the bus_no and date and print its allotted drivers.

Q.3) Create the following database in 3NF using PostgreSQL.

Consider the following Project-Employee database, which is managed by a company and stores the details of projects assigned to employees.

Project (Pno int, pname varchar (30), ptype varchar (20), duration integer)

Employee (Eno integer, ename varchar (20), qualification char (15), joining_date date)

Relationship:

Project-Employee related with many-to-many relationship, with descriptive attributes as start_date_of_Project, no_of_hours_worked.

Constraints: Primary key, pname should not be null.

Draw ER diagram and Normalization diagram for above relational schema.

Using above database solve the following questions.

A. Write a trigger before inserting joining date into employee table, check joining date should be always greater than current date. Display appropriate message.
B. Write function to accept project name as input and display names of employee's working on that project.

Q.4) Create the following database in 3NF using PostgreSQL.

Consider the following Student-Teacher database maintained by a college. It also gives information of the subject taught by teachers.

Student (Sno integer, sname varchar (20), sclass varchar (10), saddr varchar (30))

Teacher (Tno integer, tname varchar (20), qualification char (15), experience integer)

Relationship: Student-Teacher related with many to many relationship with descriptive attribute Subject.

Constraints: Primary Key, student and teacher name should not be null.

Draw ER diagram and Normalization diagram for above relational schema.

Using above database solve the following questions.

A. Write a trigger before update a student's class from student table. Display appropriate message**.**
B. Write a function to count the number of the teachers who are teaching to a student named '_____'. (Accept student name as input parameter).

Q.5) Create the following database in 3NF using PostgreSQL.

Consider the following Student –Marks database

Student (Rollno integer, sname varchar(30), address varchar(50), class varchar(10))

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

Relationship:

Student-Subject related with many-to-many relationship with attributes marks_scored.

Constraints: Primary key, sname should not be null.
Draw ER diagram and Normalization diagram for above relational schema.

Using above database solve the following questions.

A. Write a function to calculate total marks of each student and display it.
B. Write a trigger to ensure that the marks entered for a student, with respect to a subject is never < 0 and greater than 100.

Q.6) Create the following database in 3NF using PostgreSQL.

Consider the following database of Movie_Actor_Producer.

Movie (m_name varchar (25), release_year integer, budget money)
Actor (a_name char (30), role char (30), city varchar (30))
Producer (producer_id integer, pname char (30), p_address varchar (30))

Relationship:

Movie and Actor related with many-to-many relationship with descriptive attribute charges.

Producer and Movie related with many-to-many relationship.

Constraints: Primary key, release_year should not be null.
Draw ER diagram and Normalization diagram for above relational schema.
Using above database solve the following questions.

A. Write a trigger before inserting budget into a movie table. Budget should be minimum 50 lakh. Display appropriate message.
B. Write a function to list movie-wise charges of 'Amitabh Bachchan'.

Q.7) Create the following database in 3NF using PostgreSQL.

Consider the following Person–Area database

Person (pnumber integer, pname varchar (20), birthdate date, income money)

Area (aname varchar (20), area_type varchar (5))

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 above database in PostgreSQL.

Draw ER diagram and Normalization diagram for above relational schema.
Using above database solve the following questions.

A. Write a function to print total number of persons of a particular area. (Accept area_name as input parameter). Display appropriate message.

Q.8) Create the following database in 3NF using PostgreSQL.

Consider the following database maintained by a school about students and competitions.

STUDENT (sreg_no int , name char(30), class char(10))

COMPETITION (c_no int , name char(20), C_type char(15))

The relationship is as follows:

STUDENT-COMPETITION: M-M with described attributes rank and year.

Draw ER diagram and Normalization diagram for above relational schema.
Using above database solve the following questions.

A. Define a trigger on the relationship table. If the year entered is greater than current year, it should be changed to current year.