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DBMS Lab-List of Experiments

0.1 General SQL Experiments

1. Create the following two tables:

College consisting of college-code, college-name, address

Faculty consisting of fields College-code, faculty-code, faculty-name, qualification, experience (in no. of years), department, address.

The field college-code is foreign key.

Generate Queries for the following.

- (a) List all faulty members of a specified college whose experience is greater than or equal to 10 years.
 - (b) List all Faculty Members of a specified college who have at least 10 years of experience but not having M.Tech Degree.
 - (c) List out the Faculty of a specified college department wise in non decreasing order of their seniority.
 - (d) List out the Names of the Colleges having more than a specified number of faculty members.
 - (e) List out the names of the colleges having the least number of faculties and the largest number of faculty.
2. Create the following tables for a Library Management System.

Book: consisting of fields accession-no, title, publisher, author, date-of-purchase, date-of-publishing, status

Status can be “issued”, “present in the Library”, “reference”, “cannot be issued”.

Write SQL Queries for the following.

- (a) List out the total number of copies of each book in the library.
 - (b) List out the total number of reference copies for each book in the Library.
 - (c) For each book in the Library obtain a count of the total number of issued copies, number copies existing at present in the library and the number of reference copies.
 - (d) List out the details of various books of each publisher with status of the books set to “cannot be issued”.
 - (e) List out the details of the books which are new arrivals. The books which are purchased during the last 6 months are categorized as new arrivals.
 - (f) List out the details of each famous book . Each Famous book should be purchased within 1 year of its date-of –publishing and the number of total copies is more than 10.
3. Create the following tables.

Student (roll-on, name, date-of-birth)

Course (course-id, name, fee, duration)

Generate the Queries for the following.

- (a) List the names of all students who are greater than 18 years of age and have opted B.Tech Course.
- (b) List the details of those courses whose fee is greater than that of B.Tech Course.
- (c) List the details of the students who have opted more than 2 courses.
- (d) List the details (name, fee and duration) of the course which have been opted by maximum number of students and those of the course which is opted by the least number of students.
- (e) List the details of the student(s) who have opted every course.

0.1. GENERAL SQL EXPERIMENTS

4. Create the following tables.

Student(rollno, name, category, district, state),

Student-rank (rollno, mark, rank)

Generate Queries for the following.

- (a) List the details of the students with the same category and same rank.
- (b) List out the details of the students (rollno, name, category, district, rank) who secured the highest rank for each category in each state.
- (c) List the names of the students(roll no, name, category, district, mark, rank) having either marks same but ranks different or marks different but ranks same together with the status (whether they belong to the first category or second category)
- (d) Find the category with the highest academic performance and the one with the least academic performance.
- (e) Find the category whose academic performance is below the average academic performance.

5. Create the following tables.

Book(accession-no, title, publisher, year, date-of-purchase, status)

Member(member-id, name, number-of-books-issued, max-limit)

Books- issue(accession-no, member-id,date-of-issue)

Generate SQL Queries for the following.

- (a) List all those books which are due from the students. A Book is considered as Due if it has been issued 15 days back and not yet returned.
- (b) List all members who cannot be issued any more books.
- (c) List the details of the book which is taken by the maximum number of members and the book which is taken by the least number of members.
- (d) List the details of the book which is taken by every member and the one that is not yet issued.

6. Create the following tables.

Branch(branch-id, branch-name, branch-city)

Customer(customer-id, customer-name, customer-city)

Savings(customer-id, branch-id, Saving-accno, balance)

Loan(customer-id, branch-id, loan-accno, balance)

Generate the Queries for the following.

- (a) List out the details of the customers who live in the same city as they have savings or loan account.
- (b) List out the customers who have an account in a given branch-city.
- (c) List out the customers who have an account in more than one branch.
- (d) List out details of the customer who have
 - i. neither a saving account but a loan
 - ii. neither a loan but has a saving account.
 - iii. having both loan and saving.
- (e) List the names of the customers who have no saving at all but having loan in more than two branches.
- (f) For each branch produce a list of the total number of customers, total number of customers with loan only, total number of customers with saving only and the total number of customers with both loan and saving.
- (g) Find the details of the branch which has issued max amount of loan.
- (h) Find the details of the branch which has not yet issued any loan at all.

- (i) For each customer produce a list consisting of the total saving balance, loan balance for those branches where he has either a loan or a saving account or both.
7. A student academic system to be maintained in an engineering college should have the following facilities.
- (a) The system should keep
 - i. student details(student name, roll no, utyreg no, address, year of admin, year of pass out, branch of study, class teacher, emailid, phone no).
 - ii. the details of course qualification(total and the grade(first class, second class, distinction)).
 - iii. the details of project work done by each student(project title, project guide(a faculty from the college),period of implementation of the project, core area).
 - iv. the faculty details(faculty name, faculty id, emailid, designation, joining date, relieved date).
 - (b) The system must have the facility to give the answers to the following questions.
 - i. The names, roll no and address of the students who have completed the course under a given branch for each year.
 - ii. The names and roll nos of the students who completed the course for each year of pass out and for each branch.
 - iii. The details of projects under taken by the students of a particular branch.
 - iv. The name of the faculty who guided more than a specified no. of projects in each academic year.
 - v. The branch with highest academic performance, chosen for each academic year.
 - vi. The details of the students who secured the highest total for each branch and for each academic year.
 - vii. The list of students who secured a given grade, for a given academic year.
 - viii. The list of projects undertaken in each department together with the project guide name and emailid, for each academic year under a given core area.
 - ix. The number of total grades for each branch of study and for each year of admission.
 - x. The details of students in each branch admitted in a specified academic year.
 - xi. The details of the students, sorted on the basis of year of admission and branch of study.
 - xii. The best mark, worst mark and the avg mark for each branch for a given academic year. Construct the ER diagram for this system. Maintain appropriate tables to keep the information specified in (a). Write the SQL queries for getting the results to the questions mentioned in (b).
8. A central technical university(CTU) runs different types of courses(engineering, medical and management). In each type of course, there are different branches (civil, mechanical, electrical, electronics, computer, it etc for engineering, MBBS,BDS etc for medical colleges and BBA,MCA etc for management) for UG and PG. Each college approved by the university is assigned any of the grades(A+,A,B+,B,C) may run courses in either engineering and management or medical alone. In addition to the existing courses a college may apply for new courses. A CTU DB need to be created so as to maintain information regarding
- The details of the college(approved) and the details of the courses(approved and to be sanctioned) From the database, we need to retrieve the following information.
- (a) Details of all colleges which run all the courses of a specified type.
 - (b) The details of all colleges which runs a specific course.
 - (c) The details of the colleges which run a specified no. of courses.
 - (d) For each type of course, the list of each college together with the number of courses they run and the number of courses they have applied for.
 - (e) Names of all colleges which run at least one course of engineering type and at least one course in management type.
 - (f) The list of all courses for each college approved by the university.
 - (g) For each type, the name of the course that is run by the least no. of colleges.

- (h) For each type, the college that runs the maximum no. of courses.
- (i) For each college, the list of existing courses under the university but for which the college has applied for approval.
- (j) For each college, the list of new courses to be sanctioned by the university (the courses in this list should not exist at present).

Create an ER diagram for this university with the required entities and relationships. Convert the diagram to relational tables and write SQL queries for the creation of this database and information retrieval for the questions given afore.

9. A Public English Dictionary database is to be maintained online. Any registered user may contribute to the database and any online user may make use of the service of the dictionary. Each word to be inserted must have the information regarding the type of the word (noun, verb, adj, adv, etc), meaning, synonyms (at most 3), the contributor information, date of insertion. In addition, the dictionary data base must have the provision to

- (a) List out the entire contents in alphabetic order of the words in it.
- (b) List out all the words in the dictionary ending in a specific letter.
- (c) List out all the words in the dictionary containing a specific pattern.
- (d) List out all the words contributed by a specific user.
- (e) List out all the words together with contributors, date wise.
- (f) Find the type, meaning and synonyms of a given word.
- (g) Find the words with no synonyms.
- (h) List out words which have at least two synonyms.
- (i) List the names of the users, who has contributed at least one word in every day after his registration.
- (j) List the names of the contributors who has contributed more than a specified no. of words.
- (k) List names of the contributors who have contributed a particular type of word only.
- (l) List the words which can occur in more than one type.
- (m) List the names of contributors who have contributed all type of words.
- (n) List the names of the contributors who have registered most recently.

Create an ER diagram for this public English dictionary and write SQL queries for the creation of this database and information retrieval for the questions given afore.

0.2 PL/SQL Experiments

1. Write a PL/SQL code to check whether a number is even or odd.
2. Write a PL/SQL code to check whether a number is prime or not.
3. Write a PL/SQL code to find the factorial of a number.
4. Write a PL/SQL code to check whether a number is perfect or not.
5. Write a PL/SQL code to find the first n terms of the Fibonacci series.
6. Write a PL/SQL code to create a calculator.
7. Write a PL/SQL code to check whether a string is palindrome or not.
8. Given the schema **Person** (pid, pname, DOB) . Find the age of each person using cursor.
9. Given the schema **Employee**(empid, empname, joining date, relieving date, salary)
 - (a) Find the service (in years) for each relieved employee.
 - (b) Find the Pension amount to be paid to each relieved employee. (Pension is equal to the years of service *salary divided by 100.)

Use cursors.

10. Write a PL/SQL code to insert several names, roll nos and marks of three subjects for the students of a class into a table named student and compute their rank list and insert the rank information into the same table.
11. The following table shows the salary information of employees in a company. **EMPLOYEE** (empid, empname, designation, dept, salary) Write a trigger that displays the total number of tuples in the relation on each insertion, deletion and updation.
12. The following table shows the salary information of employees in a company. **EMPLOYEE**(empid, empname, salary) Write a trigger that causes insertion of a new entry into the table INCREMENT(empid, incr), if the difference arising due to an updation of the salary of an existing employee is greater than Rs. 1000/-.
13. A department in an institution maintains the following tables, for storing the sessional marks of the students in the department. sessional-mark (admn-year, regno, semester, sub1, sub2, sub3, total). The system is to be operated so as to satisfy the following constraints.
 - (a) The total mark must be found on every insertion of a new entry or updation of an existing entry. The department maintains a separate table for the storage of marks allotted as per moderation scheme using the following table.
Moderation (admn-year, semester, sub1mod, sub2mod, sub3mod).
 - (b) When an entry is made to the moderation table, the corresponding change must be reflected in the sessional-mark table, assuming that moderation must be given to those subjects whose sessional mark is less than 35 and moderation does not make the sessional mark greater than 35.

Write SQL queries for the following.

- (a) Find the regno of the students who have sessional mark ≥ 35 for a given year of admission and given semester.
 - (b) Find the average, maximum, minimum sessional mark for each subject taken semester wise for a given year of admission.
 - (c) Find the total no. of students who have secured sessional marks greater than 35 for all the three subjects, taken for each semester, and for each year of admission in a tabular form.
14. A software institution maintains the database with the following information.
- (a) Course information (course-id, course-name, fee, period)
 - (b) Student information (sname, sid, phno, emailid)

Each student may register for one or more courses and may complete or terminate the course. The db should be designed in such a way that the following constraints are to be met.

- (a) The list of students who are undergoing one or more course, who have discontinued the course and completed the course, should be kept separately.
- (b) The details of various operations performed on the db are to be maintained separately.

Also write SQL queries for the following.

- (a) The total no. of students who have joined to the institution on a specified date.
- (b) Find the date on which maximum no. of students have joined to the institution.
- (c) The list of all students who have completed the course and the list of students who have discontinued the course.