**K.K.Wagh Institute of Engineering Education and Research, Nashik (Autonomous from Academic Year 2022-23)**

**T. Y. B. Tech. Computer Engineering**

**Pattern 2022 Semester: V**

**COM223004: Database Management System Lab**

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| **List of Laboratory Experiments/ Assignments** | | |
| **Sr. No.** | **Laboratory Experiments / Assignments** | **CO Mapped** |
| 1 | **Assignment Title:** **SQL Queries:**  **Consider the given Database Schema:**  **employee (employee-name, street, city)**  **works (employee-name, company-name, salary)**  **company (company-name, city)**  **manages (employee-name, manager-name)**  **Write SQL queries for the following**   1. Create tables employee, works, company, manages. Use proper primary and foreign keys for each table.   Company name - First Bank Corporation, Small Bank Corporation, Special Bank Corporation  Cities - Pune, Mumbai, Nashik, Delhi, Kolkata  Employee names example ‘Raj Shukla’ ‘Sandip Patil’, ‘Shital Sonje’ add your 3 to 4 friends names also   1. Insert at least 5 to 10 records in each table 2. Add column Birthdate in employee table 3. Update Birthdate of all employees 4. Delete employee having name ‘Raj Shukla’’, 5. Rename salary with monthly\_salary 6. Create a table with the name Dependant ( employee-name, dependant\_name, relation) 7. Add few rows in dependant table 8. Find difference between Truncate and delete for dependant table 9. Write simple select queries for following    1. Find name of the employees starting with ‘S’    2. Find the names of all employees who work for First Bank Corporation.    3. Find name of the companies located in ‘Pune’    4. Find the age of employees    5. Find the names and cities of residence of all employees who work for First Bank Corporation    6. Find the names of the employees, salary whose salary greater than 50000    7. Find the employee names, street addresses, and cities of residence, company name of all employees    8. Find the manager of ‘Sandip Patil’    9. Find the age of all employees    10. Find the names of the employees having their birthday in January   Design 5 more simple queries having date, string and other functions as per your choice |  |
| 2 | **Assignment Title: SQL Queries all types of Join, Sub-Query and View:**  **Consider the given database schema:**  **Student (studentid , studentname, instructorid, studentcity)**  **Instructor(instructorid ,Instructorname, instructorcity, specialization)**  **Use all types of Joins**   1. Find the instructor of each student. 2. Find the student who is not having any instructor. 3. Find the student who is not having any instructor as well as the instructor who is not having a student. 4. List students and their instructors for a specific specialization (e.g., 'Computer Science'). 5. Develop SQL query to find students whose city does not match with their instructor. 6. List All Instructors and Their Students (Including Without Students) 7. List of students of each instructor who stays in Pune (Instructor) 8. Calculate the Average Number of Students per Instructor in Nashik 9. Create a view containing the total number of students whose instructor belongs to “Pune”. 10. Write following queries on view     1. List All Specializations of Instructors in Pune     2. Count Students for Each Instructor in Pune     3. Find the Number of Students Grouped by Specialization of Instructors in Pune     4. List Instructors from Pune with No Students   **Design 5 more queries having join of 3 tables and aggregate functions as per your choice** |  |
| 3 | **SQL Queries**  Consider the given Database Schema:  employee (employee-name, street, city)  works (employee-name, company-name, salary)  company (company-name, city)  manages (employee-name, manager-name)  Write SQL queries for the following  1. Find the names of all employees who work for First Bank Corporation. 2. Find the names and cities of residence of all employees who work for First Bank Corporation  3. Find the names, street addresses, and cities of residence of all employees who work for First Bank Corporation and earn more than Rs.10,000. 4. Find all employees in the database who live in the same cities as the companies for which they work.  5. Find all employees in the database who live in the same cities and on the same streets as do their managers.  6. Find all employees in the database who do not work for First Bank  Corporation.  7. Find all employees in the database who earn more than each employee of Small Bank Corporation.  8. Assume that the companies may be located in several cities. Find all companies located in every city in which Small Bank Corporation is located.  9. Find all employees who earn more than the average salary of all employees of their company.  10. Find the company that has the most employees.  11. Find the company that has the smallest payroll.  12. Find those companies whose employees earn a higher salary, on average, than the average salary at First Bank Corporation | CO1, CO2 |
| 4 | **PL/SQL block**  Create a database with following schemas  Borrower(Rollin, Name, DateofIssue, NameofBook, Status) & Fine(Roll\_no,Date,Amt)  1. Write a PL/SQL block to accept input for Borrower table. 2. Write a PL/SQL block using control structures to calculate fine by using the following rules:  a. check the number of days (from date of issue), if days are between 15 to 30 then fine  amount will be Rs 5 per day  b. If no. of days>30, per day fine will be Rs 50 per day  c. for days less than 30, Rs. 5 per day.  After submitting the book, status will change from I to R. If condition of fine is true, then details  will be stored into fine table. |  |
| 5 | **Cursors**  Write a block in PL/SQL to print a report which shows that, the employee id, name, hire date, and the incentive amount they achieved according to their working experiences, who joined in the month of current date. Use explicit cursor | CO1, CO2 |
| 6 | **Database Trigger**  Create a Library database with the schema  Books(AccNo, Title, Author, Publisher, Count).  a. Create a table Library\_Audit with same fields as of Books and Date and status column  b. Create a before trigger to insert records into Librry\_Audit table if there is deletion in Books table, insert date of deletion and status as deleted  Create a after trigger to insert records into Librry\_Audit table if there is updation in Books table , insert date of updation and status as updated | CO1, CO2 |
| 7 | **ER Modelling and Normalization:**  Conceptual Design using ER features using tools like ERD plus, ER Win etc. (Identifying entities, relationships between entities, attributes, keys, cardinalities, generalization, specialization etc.) Convert the ER diagram into relational tables and normalize the Relational data model. | CO3 |
| 8 | **Database Connectivity**:  Write a program to implement Menu driven MySQL/Oracle database connectivity with any front end language for Python/Java/PHP to implement Database navigation operations (add, delete, edit etc.) | CO5 |
| 9 | **MongoDB Queries**  Implement the following MongoDb Query  1. Create a collection named books.  2. Insert 5 records with field TITLE,DESCRIPTION,BY,URL,TAGS AND LIKES  3. Insert 1 more document in collection with additional field of user name and comments.  4. Display all the documents whose title is 'mongodb'.  5. Display all the documents written by 'Ajay' or whose title is 'mongodb'.  6. Display all the documents whose title is 'mongodb' and written by 'Ajay'.  7. Display all the documents whose like is greater than 10. 8. Display all the documents whose like is greater than 100 and whose title is either 'mongodb' or written by 'Ajay'.  9. Update the title of 'mongodb' document to 'mongodb overview' 10. Delete the document titled 'nosql overview'.  11. Display exactly two documents written by 'Ajay'.  12. Display the second document published by 'Ajay'.  13. Display all the books in the sorted fashion.  Insert a document using save method. | CO4 |
| 10 | **MongoDB Aggregation and Indexing**  Create the collection Books having the following fields TITLE, DESCRIPTION, BY, URL, TAGS AND LIKES.  Implement the following Aggregation and Indexing Queries 1. Find the number of books published by “Ajay”  2. Find books which have minimum likes and maximum likes published by “Ajay”.  3. Find the average number of likes of the books published by Ajay.  4. Find the first and last book published by “Ajay”..  5. Create an index on the author name.  Display the books published by “Ajay” and check if it uses the index which we have created | CO4 |
| 11 | **Mini Project:**  Form a group of 3 or 4 students and Using the database concepts covered, develop an application with following details:  1. Define a problem statement  2. Follow the Software Development Life cycle and other conce pts learnt in Software Engineering Course throughout the  implementation.  3. Develop application considering:  Front End: Java/Perl/PHP/Python/Ruby/.net/any other  language  Backend : MongoDB/ MySQL/Oracle  4. Test and validate applications using Manual/Automation testing. | CO1 to 5 |

Course Teacher

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| Additional Lab Assignments | | |
| 1 | **ER Modeling**  Conceptual Design using ER features using tools like ERD plus, ER Win etc. (Identifying entities, relationships between entities, attributes, keys, cardinalities, generalization, specialization etc.) Convert the ER diagram into relational tables and normalize the Relational data model.  ER model of a Hospital management using the following description . Each of these entities have their respective attributes which are −  Patients - ID(primary key), name, age,visit\_date  Tests- Name(primary key), date, result  Doctor- ID(primary key), name, specialization | CO3 |
| 2 | **SQL Queries**  Consider the following schema  account(acc-no,branch-name,balance)  depositor(cust-name,acc-no)  borrower (cust-name, loan-no)  loan (loan - no, branch - name, amount)  Write following queries using SQL  1. Create tables using proper primary keys  2. Update information of particular customer  3. Find the customers having loan less than 1 lac  4. Display account number and customer name starting with ‘P’ 5. Display name of the depositor with balance  6. Find names of all customers who have a loan at the ‘Redwood branch’.  7. Find all customers who have an account and loan or both. 8. Find all customers who do not have loan  9. Find average account balance at each branch.  10. Find the name of borrower having maximum loan amount | CO1, CO2 |
| 3 | **PLSQL Block**  Write a Stored Procedure namely proc\_Grade for the categorization of students. If marks scored by students in examination is <=1500 and marks>=990 then students will be placed in distinction category if marks  scored are between 989 and 900 category is first class, if marks 899 n 825 category is Higher Second Class and Less than 825 and > 600 have ‘Pass Class’. Insert the result in Result table for all  Write a Stored Procedure for calculating Number of students getting each class e.g Distinction - 10 students, First class -5 students. Insert count in the Analysis table  Write a PL/SQLblock to use procedures created with the above requirement. Stud\_Marks(roll,  name, total\_marks) Result(Roll,Name, Class)  Analysis( class , count) | CO1, CO2 |
| 4 | Cassandra Queries: Design and Develop Queries using CRUD operations | CO4 |