DATABASE MANAGEMENT SYSTEMS LAB
(Common to CSE and AI&DS)
II Year – I Semester

Practical: 4	Internal Marks : 15
Credits : 2	External Marks : 35

Course Objectives

- To familiarize with creation of database and formulate SQL solutions to manipulate the database.
- To disseminate knowledge on triggers and PL/SQL programs in a database environment.

Course Outcomes

Upon successful completion of the course, the students will be able to

- create relational database with the given constraints.
- formulate simple and complex queries using features of SQL.
- create views on relational database based on the requirements of users.
- develop PL/SQL programs for processing multiple SQL statements.
- implement triggers on a relational database.

List of Experments

1. Execute **DDL, DML, DCL** and **TCL** Commands on below given relational schema. **EMP**(Empno, Ename, Job, Salary, Mgr, Comm, Hiredate, Deptno).
2. Implement the following integrity constraints on the following database **EMP** (Empno, Ename, Job, Salary, Mgr, Comm, Hiredate, Deptno) **DEPT**(Deptno, Dname, Location)
   a. Primary Key b. Foreign Key c. Unique d. Not NULL e. Check.
3. Execute basic **SQL** statements using the following
   a) Projection b) Selection
   c) arithmetic operators d) Column aliases
   e) Concatenation operator f) Character Strings
   g) Eliminating Duplicate Rows
   h) Limiting Rows Using
      - Comparison operators
      - LIKE,BETWEEN AND,IN operators
      - Logical Operators

   i) ORDER BY Clause
      - Sorting in Ascending Order
      - Sorting in Descending Order
      - Sorting by Column Alias
      - Sorting by Multiple Columns
4. Execute the following **single row functions** on a Relation.

- Character Functions
  - Case-manipulation functions(LOWER, UPPER, INITCAP)
  - Character-manipulation functions(CONCAT, SUBSTR, LENGTH, INSTR, LPAD | RPAD, TRIM, REPLACE)
- Number Functions(ROUND, TRUNC, MOD)
- Date functions
  - Months_Between
  - Add_Months
  - Next_Day
  - Last_Day
  - Round
  - Trunc
  - Arithmetic with Dates

5. Execute the following Multiple row functions (Aggregate Functions) on Relation.
   - Group functions(AVG, COUNT, MAX, MIN, SUM)
   - DISTINCT Keyword in **Count** Function
   - Null Values in Group Functions
   - NVL Function with Group Functions
6. Create Groups of Data using **Group By** clause
   - Grouping by One Column
   - Grouping by More Than One Column
   - Illegal Queries Using Group Functions
   - Restricting groups using HAVING Clause
   - Nesting Group Functions
7. Retrieve Data from Multiple Tables using the following join operations
   - Cartesian Products
   - Equijoin
   - Non-equijoin
   - Outer join
   - Self join
8. Execute Set operations on various Relations.
   - UNION
   - UNION ALL
   - INTERSECT
   - MINUS
9. Execute Sub Queries and Co-Related Nested Queries on Relations.
   - Implement
     - Single-row subquery
     - Multiple-row subquery
   - Using Group Functions in a Subquery
   - Using HAVING Clause with Subqueries
   - Using Null Values in a Subquery
   - Data retrieval using Correlated Subqueries
     - EXISTS Operator
     - NOT EXISTS Operator
10. Perform following operations on views
    - Simple Views
    - Complex Views
    - Modifying a View

- DML Operations on a View
- Denying DML Operations on view
- Removing a View

11. Develop the following PL/SQL programs
    - Simple PL/SQL programs
    - PL/SQL programs Using Control structures.
        - Conditional structures
        - Iterative structures
    - PL/SQL program using the following exception handling mechanisms.
        - Pre defined exceptions
        - user defined exceptions
12. Implement a PL/SQL block using triggers for transaction operations of a typical application.

    Note: For above experiments purpose use Sailors or Bank or Employee database from given text books.

Reference Books

1. Korth and Sudarshan, "Database system concepts", 3rd edition, MH.
2. Raghu Ramakrishnan, Johannes Gehrke, "Database Management Systems", 3rd edition, MH
3. Benjamin Rosenzweig, Elena Silvestrova, "Oracle PL/SQL by Example", 3rd edition, Pearson Education.
4. Scott Urman, "Oracle Database Log PL/SQL Programming", Tata Mc-Graw Hill.
5. Dr. P.S. Deshpande, "SQL and PL/SQL for Oracle 10g".

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