LABORATORY MANUAL

Subject: DATABASE MANAGEMENT SYSTEM (ITC304)

Class: S.E./I.T./A&B

Academic Year: 2017-18

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St. Francis Institute of Technology

Department of Information Technology

Database Management System (ITC304)

Lab Manual

Academic Year: 2017-2018

Semester: III
Class / Branch / Division: S.E./I.T./A&B

St. Francis Institute of Technology

Department of Information Technology

Academic Year: **2017-18** Semester: **III**
Class / Branch / Division: **S.E./I.T./A & B**
Subject: **Database Management System**

LIST OF EXPERIMENTS

Sr. No.	Title of Experiment	CO addressed
1	Formulate a problem statement for the chosen real life application	CO1
2	Construct an ER/ EER diagram and design a relational model for the chosen system	CO2
3	Apply relational algebra on the chosen system	CO2
4	Create and manipulate database using SQL DDL and DML queries on the chosen system	CO3
5	Perform complex queries using group by, nested and recursive queries on the chosen system	CO4
6	Perform joins and views on the chosen system	CO4
7	Implement Triggers and Cursors on the chosen system	CO4
8	Design and implementation of a full-fledged database with front-end using JDBC for the real life application	CO1
9	Conversion of relations to different normal forms	CO5
10	Program for construction of index B-tree/B+-tree	CO6

Course Outcomes:	
CO1	Construct problem definition statements for real life applications and implement a database for the same.
CO2	Design conceptual models of a database using ER modeling for real life applications and also construct queries in Relational Algebra.
CO3	Create and populate a RDBMS, using SQL.
CO4	Write queries in SQL to retrieve any type of information from a data base.
CO5	Analyze and apply concepts of normalization to design an optimal database.
CO6	Implement indexes for a database using techniques like B or B+ trees.

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INFORMATION TECHNOLOGY DEPARTMENT

Database Management System

Class: S.E. IT A & B Academic Year: 2017-18

Experiment: 1
Title: Formulate a problem statement for the chosen real life application

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Aim: Formulate a problem statement for the chosen real life application

Software Used: Microsoft Word

Procedure:

Problem statement - Design a problem statement in order to understand the proposed system concisely.

Conclusion:

Conclusion should summarize in short what you have studied from this case study, explain the importance and applications of the experiment learned.

Post-lab Exercise (Viva): Questions similar to following may be asked.

1. What are the advantages of storing data in database?
2. What is a problem statement?
3. What is the need of a database? Etc.

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Experiment: 2
Title: Construct and ER/EER diagram and design a relational model for the chosen system.

Aim: To construct and ER/EER diagram and design a relational model for the chosen system.

Software Used: Microsoft Word, Smart Draw / Microsoft Visio

Theory:

- Explain an Entity Relationship (ER) diagram with notations
- Explain basic terms used in Extended Entity Relationship (EER)
- Explain what is a Relational Model and how to make one.

Procedure:

- Draw ER diagram
- Draw EER diagram
- Stepwise design a relational model

Conclusion:
Conclusion should summarize in short what you have studied from this case study, explain the importance and applications of the experiment learned.

Post-lab Exercise (Viva): Questions similar to following may be asked.

1. What are the limitations of ER diagram?
2. What are the types of entities?
3. What do you mean by Cardinality? Etc.

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Class: S.E. IT A & B Academic Year: 2017-18

Experiment: 3
Title: Apply Relational Algebra on the chosen system

Aim: To apply Relational Algebra on the chosen system

Software Used: Microsoft Word

Theory:
Explain what is Relational Algebra
Explain each of the primary operations of Relational Algebra with example:

- Select
- Project
- Union
- Set different
- Cartesian product
- Rename

Procedure:
Solve queries in relational algebra

Conclusion:
Conclusion should summarize in short what you have studied from this case study, explain the importance and applications of the experiment learned.

Post-lab Exercise (Viva): Questions similar to following may be asked.

1. What is the difference between select and project?
2. What do you mean by a Cartesian product? Etc.

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Class: S.E. IT A & B Academic Year: 2017-18

Experiment: 4
Title: Create and manipulate database using SQL DDL and DML queries on the chosen system

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Aim: To create and manipulate database using SQL DDL and DML queries on the chosen system

Software Used: Oracle 11g/SQL Server 2008 R2, Microsoft Word

Theory:
Data Definition Language (DDL)
Explain what is DDL?
DDL command and their syntax

Data Manipulation Language (DML)
Draw Explain what is DML?
DML command and their syntax

Procedure:
Solve queries using SQL DDL and DML queries on the chosen system

Conclusion:
Conclusion should summarize in short what you have studied from this case study, explain the importance and applications of the experiment learned.

Post-lab Exercise (Viva): Questions similar to following may be asked.

1.What is the difference between drop and truncate command?
2. Why no rollback operation can be performed when we use DDL commands?
3. What is the execution pattern of an SQL query? Etc.

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Class: S.E. IT A & B Academic Year: 2017-18

Experiment: 5
Title: Perform complex queries using group by, nested and recursive queries on the chosen system

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Aim: To perform complex queries using group by, nested and recursive queries on the chosen system

Software Used: Oracle 11g/SQL Server 2008 R2, Microsoft Word

Theory:
Implement three examples each what is

- Group by clause
- Nested queries
- Recursive queries

Procedure:
Solve queries using group by, nested and recursive queries on the chosen system

Conclusion:
Conclusion should summarize in short what you have studied from this case study, explain the importance and applications of the experiment learned.

Post-lab Exercise (Viva): Questions similar to following may be asked.

1. What are aggregates functions?
2. Give an example of the order by clause. Etc.

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Class: S.E. IT A & B Academic Year: 2017-18

Experiment: 6
Title: Perform joins and views on the chosen system

Aim: To perform joins and views on the chosen system

Software Used: Oracle 11g/SQL Server 2008 R2, Microsoft Word

Theory:

- Explain what are Joins.
- Implement examples of:
    - Inner join
    - Left join
    - Right join
    - Full join
    - Cross join
- Explain what are Views

Procedure:
Implement joins and views on the chosen system

Conclusion:
Conclusion should summarize in short what you have studied from this case study, explain the importance and applications of the experiment learned.

Post-lab Exercise (Viva): Questions similar to following may be asked.

1. What is the general syntax of creating a view.
2. Give the syntax for deleting a view. Etc.

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Class: S.E. IT A & B Academic Year: 2017-18

Experiment: 7
Title: Implement Triggers and Cursors on the chosen system.

Aim: To implement Triggers and Cursors on the chosen system.

Software Used: Oracle 11g/SQL Server 2008 R2, Microsoft Word

Theory:

- Explain what are Triggers
- Types of triggers
- What are cursors?
- Types of cursors and their attributes

Procedure:
Implement three examples of triggers and cursors.

Conclusion:

Conclusion should summarize in short what you have studied from this case study, explain the importance and applications of the experiment learned.

Post-lab Exercise (Viva): Questions similar to following may be asked.

1. What is the Event Condition Action (ECA) Model?
2. What are the steps in using an explicit cursor?
3. What is the difference between triggers and cursors in SQL? Etc.

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Class: S.E. IT A & B Academic Year: 2017-18

Experiment: 8
Title: Design and implementation of a full-fledged database with front-end using JDBC for the real life application.

Aim: To design and implementation of a full-fledged database with front-end using JDBC for the real life application.

Software Used: Oracle 11g/SQL Server 2008 R2, Microsoft Visual Studio/ PHP, Microsoft Word

Theory:

- Front-end that would be used
- Explain JDBC driver?
- Steps to build a JDBC connection
- Explain step by step how to connect the database with front -end

Procedure:
Implement a full-fledged database with front-end using JDBC for the chosen application

Conclusion:
Conclusion should summarize in short what you have studied from this case study, explain the importance and applications of the experiment learned.

Post-lab Exercise (Viva): Questions similar to following may be asked.

1. What is a connection?
2. What is a ResultSet?
3. What are the different types of JDBC Statements? Etc.

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Class: S.E. IT A & B Academic Year: 2017-18

Experiment: 9
Title: Conversion of relations to different normal forms

Aim: To convert relational tables to different normal forms

Software Used: Oracle 11g/SQL Server 2008 R2, Microsoft Word

Theory:

- What is normalization?
- Explain functional dependency
- Explain each type of normalization with example.

Procedure:
Apply normalization on relational tables of the chosen system.

Conclusion:
Conclusion should summarize in short what you have studied from this case study, explain the importance and applications of the experiment learned.

Post-lab Exercise (Viva): Questions similar to following may be asked.

1.What is a transitive dependency?
2. What is a lossless join dependency? Etc.

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Class: S.E. IT A & B Academic Year: 2017-18

Experiment: 10
Title: Program for construction of index B-tree/B+-tree

Aim: To implement a program for construction of index B-tree/B+-tree

Software Used: Oracle 11g/SQL Server 2008 R2, Microsoft Word

Theory:

- Explain what is indexing?
- Explain Btrees

Procedure:
implement a program for construction of index B-tree/B+-tree in any programming language

Conclusion:
Conclusion should summarize in short what you have studied from this case study, explain the importance and applications of the experiment learned.

Post-lab Exercise (Viva): Questions similar to following may be asked.

1.What is hashing?

2. Which are the hashing techniques? Etc.