24PC1011   Distributed Database Systems

Objectives:

- To Introduce various Distributed Database Applications in real world scenario
- To learn about various Distributed Database Techniques
- Applying efficient Advanced Techniques to solve various engineering problems

Outcomes:

On successful completion of the course, the student will:
- Be able to Compare various Distributed Databases methods
- Be able to understand and identify the analytical characteristics of Distributed Databases algorithms.
- Employ algorithm to model engineering problems, when appropriate

Module – I

Distributed Data Processing, Promises of Distributed Databases, Complicating Factors and Problem Areas. Architectural Models for Distributed DBMSs – Homogeneous, Heterogeneous, Client/server Distributed Databases versus Replicated Databases. Distributed Database Design - Alternative Design Strategies, Distribution Design Issues, Fragmentation, Allocation.

Module – II

Concepts of Database links - Types of Database Links, Creating and Managing Database Links,
Restrictions through Database Links, Practical Scenarios and examples. Transparencies -Database link name resolution, Schema object name resolution, Location trans-RPC, creating location transparencies using views, synonyms and procedures, Managing statement trans.

Module – III

Transaction processing - Concept and Properties of Transactions, Remote and Distributed SQL Statements, Shared SQL for Remote and Distributed Statements, Remote and Distributed Transactions, 3PC Mechanisms and its types. Semantic Data Control - View Management, Data Security, Semantic Integrity control, Query processing and Query optimization strategies - Distributed Query Processing Methodology, Distributed Query Optimization, New query optimization techniques in distributed database, Distributed Query Optimization problems and some solutions, Advantages of query optimization techniques in distributed database.

Module – IV

Autonomy and Security in Distributed Databases - Site Autonomy, DD Security, Authentication trough Database Links, Authentication without Password, Supporting User Accounts and Roles, Centralized User and Privilege Management, Data Encryption, Database Auditing. Current Trends in Distributed Database - Data Delivery Alternatives, Data Warehousing, World Wide Web, Push-based Technologies, Mobile Databases, Real Application Clusters (RAC), Cloud based databases.

Books:

1. Principles of Distributed Database Systems by M. TAMER OZSU, Patrick Valduriez, S. Sridhar (Pearson Publication)
2. Database system concepts', 6th Edition –Abraham Silberschatz, Henry Korth, S, Sudarshan, McGraw Hill International
3. Distributed Databases by Stefano Ceri, Giuseppe Pelagatti (TMH)