CP5078 DATABASE ADMINISTRATION AND TUNING L T P C
3 0 0 3

OBJECTIVES:

- To understand the tasks in database administration.
- To learn the methods to secure the database and to recover from failures.
- To understand the fundamentals of database tuning.
- To apply indexing techniques and query optimization for database tuning.
- To understand and measure performance monitors to troubleshoot the database system.

UNIT I INTRODUCTION TO DATABASE ADMINISTRATION 10

Database Administration - DBA Tasks- Database Design - Performance Monitoring and Tuning – Availability - Database Security and Authorization - Backup and Recovery - Data Integrity - DBMS Release Migration - Types of DBAs - Creating the Database Environment - Choosing a DBMS - DBMS Architectures - DBMS Clustering - DBMS Proliferation - Hardware Issues - Installing the DBMS - DBMS Installation Basics Hardware Requirements - Storage Requirements Memory Requirements Configuring the DBMS - Connecting the DBMS to Supporting Infrastructure Software - Installation Verification - DBMS Environments - Upgrading DBMS Versions and Releases - Fallback Planning - Migration Verification

UNIT II DATABASE SECURITY, BACKUP AND RECOVERY 10

Database Users - Granting and Revoking Authority - Types of Privileges - Granting to PUBLIC- Revoking Privileges - Security Reporting - Authorization Roles and Groups - Using Views for Security - Using Stored Procedures for Security Auditing - SQL Injection Prevention - External Security - Job Scheduling and Security - Image Copy Backups - Full vs. Incremental Backups - Database Objects and Backups - DBMS Control - Concurrent Access Issues - Backup Consistency - Log Archiving and Backup - DBMS Instance Backup - Designing the DBMS Environment for Recovery - Types of Recovery - Alternatives to Backup and Recovery – DBA Tools – DBA Rules of Thumb.

UNIT III FUNDAMENTALS OF TUNING 8

Review of Relational Databases – Relational Algebra – Locking and Concurrency Control – Correctness Consideration – Lock Tuning – Logging and the Recovery Subsystem – Principles of Recovery – Tuning the Recovery Subsystem – Operating Systems Considerations – Hardware Tuning.

UNIT IV INDEX TUNING AND QUERY OPTIMIZATION 9

Types of Queries – Data Structures – B tree – B+ Tree - Hash Structures – Bit Map Indexes – Clustering Indexes – Non Clustering Indexes – Composite Indexes – Hot Tables – Comparison of Indexing and Hashing Techniques. Optimization Techniques - Tuning Relational Systems –- Normalization – Tuning Denormalization – Clustering Two Tables – Aggregate Maintenance – Record Layout – Query Cache – Parameter Cache - Query Tuning – Triggers – Client Server Mechanisms – Objects, Application Tools and Performance –Tuning the Application Interface – Bulk Loading Data – Accessing Multiple Databases.

UNIT V TROUBLESHOOTING 8

Query Plan Explainers – Performance Monitors – Event Monitors. Finding 'Suspicious' Queries – Analyzing Query's Access Plan – Profiling Query Execution. Tuning DBMS Subsystems - Disk Subsystem - Buffer Manager - Logging Subsystem - Locking Subsystem. Troubleshooting CPU, Disks and Controllers, Memory, and Networks.

TOTAL: 45 PERIODS

OUTCOMES:

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

- Describe the principle functions in database administration and security
- Discuss the need for performance tuning in databases
- Write optimized code for accessing multiple databases
- Reconstruct indexes and optimize queries for better database performance.
- Carry out troubleshooting in database systems

REFERENCES:

1. Craig S. Mullins, "Database Administration: The Complete Guide to Practices and Procedures", Addison-Wesley Professional, 2nd edition, 2013.
2. Dennis Shasha and Philippe Bonnet, "Database Tuning, Principles, Experiments and Troubleshooting Techniques", Elsevier Reprint, 2005.
3. Silberschatz, Korth, "Database System Concepts", McGraw Hill, 6th edition, 2010.
4. Thomas Connoly and Carlolyn Begg, "Database Systems, A Practical Approach to Design, Implementation and Management", Fourth Edition, Pearson Education, 2008.

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CP5077 DATA WAREHOUSING AND DATA MINING TECHNIQUES L T PC
3 0 0 3

OBJECTIVES:

- To understand data mining principles and techniques and Introduce DM as a cutting edge business intelligence.
- To expose the students to the concepts of data warehousing architecture and implementation.
- To learn various Data Mining techniques such as classification, clustering & Association rule mining
- To study the overview of developing areas – web mining, text mining and ethical aspects of data mining.
- To identify business applications and trends of data mining.