PostgreSQL Basics Training

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Duration: **2 Day**

Overview

{*training} provides a strong foundation in PostgreSQL, a powerful open-source relational database system. You will learn how to install, configure, and manage PostgreSQL in a development environment. The course covers:

- Working with various data types
- Writing SQL queries
- Designing efficient database schemas
- Optimizing query performance
- Transaction and user management
- Implementing basic security policies
- Performing essential backup and restore operations

The course blends theoretical concepts with hands-on exercises, enabling you to apply what you've learned in real-world projects.

Prerequisites

Basic knowledge of databases, OS, networking, and programming

Who Should Attend

- Software Developers
- Data Scientists
- System Administrators
- Technical Professionals

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What You Will Learn

By the end of this {*training}, you will have gained knowledge and skills in the following areas:

- Install and configure PostgreSQL
- Use key data types: numeric, character, date/time
- Write SQL queries using joins, filters, aggregations
- Design normalized database schemas
- Optimize queries with B-tree indexes
- Understand transactions and isolation levels
- Manage users and roles securely
- Use GRANT/REVOKE for permissions
- Implement security and access controls
- Perform backups and recovery procedures

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Outline

1. Introduction to PostgreSQL

Overview, features, and benefits

2. Installation & Configuration

Cross-platform installation steps, tools (pgAdmin, psql), configuration files, remote access setup

3. Data Types & Tables

All types: numbers, text, date/time, boolean, arrays, JSON, vector types. Creating and modifying tables

4. SQL Fundamentals

SELECT, WHERE, JOIN, GROUP BY, INSERT, UPDATE, DELETE, NULL handling

5. Database Design Principles

Normalization (1NF-3NF), keys, table relationships, constraints, schema usage

6. Indexing & Performance

Index types (B-tree, Hash, BRIN), EXPLAIN, query tuning, performance monitoring

7. Transaction Management

ACID, BEGIN/COMMIT/ROLLBACK, isolation levels, concurrency, deadlock resolution

8. Security & Authorization

User/role management, GRANT/REVOKE, schema and object permissions, password policies

9. Backup & Recovery

Logical vs. physical backups, tools, restoration methods