Database Skills Journey

PostgreSQL for Database Developers

Quickly Migrate Your SQL Experience to Leverage Core Features and Functionality within PostgreSQL

Course Snapshot

- **Course: PostgreSQL Server for Database Developers (TTDB7024)**
- **Duration**: 3 days
- **Audience & Skill-Level**: This introductory-level course is for experienced database developers with incoming experience with SQL, including DDL, DML, and writing effective SQL queries.
- **Hands-on:** This hands-on course combines engaging instructor-led presentations and practical demonstrations with programming exercises, challenge labs, use case exploration and engaging group activities. Student machines are required.
- **Format**: This course can be delivered for your team or organization **online live (virtual)**, **onsite in-person** or across our robust **blended learning platform (LXP).**
- **Customizable**: This course agenda, topics, labs, hours and delivery modalities can be adjusted to target your specific training skills objectives, tools and learning goals. Please ask for details.

Overview

PostgreSQL is a powerful, open-source object-relational database management system that emphasizes extensibility, data integrity, and high performance. Its versatility and robust feature set make it an ideal choice for developers working on projects of all sizes, from small-scale applications to enterprise-level systems. By learning PostgreSQL, developers can tap into its advanced capabilities, such as full-text search, spatial data support, and customizable data types, allowing them to create efficient and scalable solutions tailored to their unique needs.

PostgreSQL for Database Developers is a three-day hands-on course that explores the fundamentals of database management, covering everything from installation and management to advanced SQL functions. Designed for beginners and enthusiasts alike, this course will equip you with the knowledge and skills required to effectively harness the power of PostgreSQL in today's data-driven landscape.

Throughout the course you'll be immersed in a variety of essential topics, such as understanding data types, creating and managing indexes, working with array values, and optimizing queries for improved performance. You'll gain valuable hands-on experience with real-world exercises, including the use of the psql client, writing triggers and stored procedures with PL/pgSQL, and exploring advanced SQL functions like Common Table Expressions (CTE), Window Functions, and Recursive Queries. You'll exit this course with a solid foundation in PostgreSQL, enabling you to confidently navigate and manage your databases with ease and efficiency.

Learning Objectives

This course combines engaging instructor-led presentations and useful demonstrations with valuable hands-on labs and engaging group activities.

Upon completing this course, database developers will be able to:

- Design and implement efficient database schemas by employing normalization techniques, appropriate indexing strategies, and partitioning methods to optimize data storage and retrieval processes.
- Develop advanced SQL queries, including joining multiple tables, utilizing subqueries, and aggregating data, to extract valuable insights and facilitate decision-making processes.
- Implement stored procedures, functions, and triggers to automate common database tasks, enforce data integrity, and improve overall application performance.
- Apply database performance tuning techniques, such as query optimization, index management, and transaction control,

to ensure optimal resource usage and enhanced system responsiveness.
- Integrate databases with various programming languages and platforms, enabling seamless data access and manipulation for web, mobile, and desktop applications.

If your team requires different topics, additional skills or a custom approach, our team can collaborate with you to further adjust the course to focus on your specific learning objectives and goals.

Audience

The ideal audience for this course includes database enthusiasts, IT professionals, and developers who are eager to expand their knowledge and skill set in database management and optimization. Roles that would greatly benefit from attending this course include:
- Database Developers: Those who design, implement, and maintain databases as part of their primary responsibilities and want to improve their expertise in schema design, query optimization, and advanced database features.
- Backend Developers: Professionals who work on server-side application logic and require a strong understanding of database management to integrate data storage and retrieval processes into their applications.
- Data Analysts: Individuals who work with large data sets and need to extract meaningful insights from databases, utilizing advanced SQL querying techniques and data manipulation tools.
- IT Professionals: System administrators and other IT staff who are responsible for managing and maintaining databases, ensuring data security, and optimizing performance.
- Software Engineers: Developers seeking to expand their knowledge in database technologies to build scalable and efficient applications that rely on robust data management solutions.

Pre-Requisites

To ensure a smooth learning experience and maximize the benefits of attending this course, you should have the following prerequisite skills:
- Basic SQL Knowledge: Familiarity with SQL syntax and concepts, such as SELECT, INSERT, UPDATE, and DELETE statements, as well as an understanding of relational databases and how they store and organize data.
- General Programming Experience: Competence in at least one programming language (e.g., Python, Java, C#, or JavaScript) to facilitate the understanding of database integration and automation through stored procedures, functions, and triggers.

Take Before: We recommend attendees have the skills in the course listed below, or attend this course as a pre-requisite:
- TTSQL003 Introduction to SQL Querying Basics

Related Courses
This is a subset of related courses we offer. Please see the website for the complete catalog.
- TTDB7020 PostgreSQL Server Administration Fundamentals
- TTDB7023 Advanced PostgreSQL Administration and Performance
- TTDB7024 PostgreSQL for Database Developers
- TTDB7026 Working with PostgreSQL: Hands-on Guide to Robust Database Solutions

Next Steps / Follow-on Courses: We offer a wide variety of follow-on courses for next-level SQL, database, scripting, administration, security and more. Please see our **Database Skills Journeys & Learning Paths** for options based on your specific role and goals.

Enhanced Learning Services: Please also ask about our robust Learning Experience Platform (LXP), Skills Assessment & Skills Prep Services, Skills Immersion Programs & Camps, Coaching and Mentoring Services and Extended Learning Support programs.

Course Topics / Agenda

Please note that this list of topics is based on our standard course offering, evolved from typical industry uses and trends. We'll work with you to tune this course and level of coverage to target the skills you need most. Topics, agenda and labs are subject to change, and may adjust during live delivery based on audience skill level, interests and participation.

1. **Installing & Managing PostgreSQL**
- PostgreSQL installation process
- Optimal configuration settings
- User and role management
- Database backup and restoration

2. **Overview of PostgreSQL Database**
- PostgreSQL architecture overview
- Understanding database objects
- Efficient data storage
- Transaction management basics

3. **Using the psql client**
- Introduction to psql
- Essential psql commands
- Executing queries effectively
- Managing databases with psql

4. **Understanding PostgreSQL data types**
- Numeric data types explored
- Character and binary types
- Date, time, and boolean values
- Array and other types

5. **Understanding sequences**
- Sequence creation and usage
- Customizing sequence behavior
- Implementing auto-increment columns
- Sequence manipulation and control

6. **Creating & managing indexes**
- PostgreSQL index fundamentals
- Designing partial indexes
- Utilizing expression-based indexes
- Index management techniques

7. **Using COPY to load data**
- COPY command overview
- Importing and exporting data
- Handling CSV and binary formats
- Performance considerations

8. **Working with Array Values**
- Array value basics
- Array manipulation functions
- Querying arrays efficiently
- Multidimensional array handling

9. **Advanced SQL Functions**
- Mastering Common Table Expressions
- Utilizing Window Functions
- Regular Expressions in SQL
- Crafting Recursive Queries

10. **Writing triggers & stored procedures with PL/pgSQL**
- PL/pgSQL variables usage
- Implementing loop operations
- PERFORM and EXECUTE statements
- Developing PostgreSQL triggers

11. **Using the PostgreSQL query optimizer**
- Query analysis and optimization
- EXPLAIN command insights
- PostgreSQL query operators
- Identifying performance bottlenecks

12. **Improving query performance**
- Query performance tuning
- Index optimization strategies
- Efficient database partitioning
- Connection and resource management

13. **Wrap Up & Additional Resources**
- Further learning opportunities
- Staying up-to-date with PostgreSQL
- Community engagement and support

Student Materials & Lab Environment

All course software (limited versions, for course use only), digital courseware files or course notes, labs / data sets and solutions (as applicable) are provided for you in our "easy access / no install required" high-speed remote lab environment. Our tech team works with every student to ensure everyone is set up with solid access and ready to go prior to every course start date, ensuring smooth delivery and great hands-on experience. Please ask for details.

For More Information

For more information about our dedicated skills-focused training services (instructor-led, self-paced or blended), collaborative coaching services, robust Learning Experience Platform (LXP) solutions, Career Experiences, public course schedule, partner programs, courseware licensing options or to see our complete list of course offerings, training solutions and special offers

please visit us at **www.triveratech.com**, email **Info@triveratech.com** or call us toll free at **844-475-4559.** Our pricing and services are always satisfaction guaranteed.