

Course Outline



Tel: +44 (0) 118 979 4000 Fax: +44 (0) 118 979 4000

Email: training@ptr.co.uk Web: www.ptr.co.uk

MariaDB for Developers

Course Description:

This MariaDB Developers training course is designed for MariaDB Developers who have a good understanding of a MariaDB (or MySQL) database and experience of using SQL commands. The course provides further practical experience in more advanced MariaDB commands and SQL statements including Stored Routines and Triggers.

This course will benefit developers who have a basic understanding of a MariaDB (or MySQL) database and SQL commands as covered on the Introduction to MariaDB course.

Pre-requisites:

A working knowledge of MariaDB (or MySQL) is required. This can be gained by attendance on the Introduction to MariaDB.

Course Content:

- **CLIENT/SERVER CONCEPTS**
 - MariaDB client/server architecture
 - Server modes
 - Using client programs
 - Logging in options
 - Configuration files
 - Precedence of logging in options
 - Exercises: Using client/server

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- **THE MYSQL CLIENT PROGRAM FOR MariaDB**
 - Using MariaDB interactively
 - The MariaDB prompts
 - Client commands and SQL statements
 - Editing
 - Selecting a database
 - Help
 - Safe updates
 - Using script files
 - Using a source file
 - Redirecting output into a file
 - Command line execution
 - MariaDB output formats
 - Overriding the defaults
 - Html and xml output
 - MySQL Utilities
 - Exercises: Using the MySQL client program to connect to MariaDB
- **DATA TYPES**
 - Bit data type
 - Numeric data types
 - Auto_increment
 - Character string data types
 - Character sets and collation
 - Binary string data types
 - Enum and Set data types
 - Temporal data types
 - Timezone support
 - Spatial Datatypes
 - Handling Missing Or Invalid Data Values
 - SQL_MODE options
 - Exercises: Using data types

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- **IDENTIFIERS**

- Using Quotes with identifier naming
- Case sensitivity in Identifier naming
- Qualifying columns with table and database names
- Using reserved words as identifiers
- Function names
- Exercises: Using identifiers

- **DATABASES**

- Database properties
- Creating a database
- Selecting a database
- Altering databases
- Dropping databases
- Obtaining database metadata
- The SHOW command
- The INFORMATION_SCHEMA database
- The SHOW CREATE command
- Exercises: Using databases

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- **TABLES AND INDEXES**

- Table properties
- Creating tables
- Create table using Select or Like
- Temporary tables and memory tables
- Altering tables
- Adding columns
- Changing column widths and types
- Renaming columns
- Dropping columns
- Adding constraints
- Dropping constraints
- Renaming tables
- Change the table storage engine
- Multiple alterations
- Dropping tables
- Emptying tables
- Obtaining table metadata
- Show create table
- The information_schema
- Index introduction
- Structure of a MariaDB index
- Creating and dropping indexes
- Creating an index
- Altering a table to add an index
- Specifying index type
- Dropping indexes
- Obtaining Index Metadata
- Exercises: Creating, altering and dropping tables/indexes

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- **QUERYING FOR DATA**
 - The SQL select statement and MariaDB differences
 - Advanced order by
 - Order by and collation
 - Order by with enum datatype
 - Order by with Set datatype
 - Ordering with distinct and group by
 - Special features of union
 - Limit and order by clauses
 - Group By clause
 - Group_concat
 - Using Rollup in a Group By clause
 - Exercises: Querying for data
- **SQL EXPRESSIONS AND FUNCTIONS**
 - Components of expressions
 - Nulls
 - Numeric expressions
 - String expressions
 - Temporal expressions
 - Comparison functions
 - Flow control functions
 - Numeric functions
 - String functions
 - Temporal functions
 - Exercises: Using expressions and functions

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- **OBTAINING DATABASE METADATA**

- What is metadata?
- Using mysqlshow utility with MariaDB
- The show and describe commands
- Describing tables
- The information_schema
- Listing tables
- Listing columns
- Listing views
- Listing key_columns_usage
- Exercises: Obtaining database metadata
- What is metadata?
- Using mysqlshow utility with MariaDB
- The show and describe commands
- Describing tables
- The information_schema
- Listing tables
- Listing columns
- Listing views
- Listing key_columns_usage
- Exercises: Obtaining database metadata

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- **DEBUGGING**

- MariaDB error messages
- The show statement
- Show errors
- Show count(*) errors
- Show warnings
- Show count(*) warnings
- Note messages
- The perror utility
- Exercises: Debugging
- MariaDB error messages
- The show statement
- Show errors
- Show count(*) errors
- Show warnings
- Show count(*) warnings
- Note messages
- The perror utility
- Exercises: Debugging

- **JOINS**

- Overview of inner joins
- Cartesian product
- Inner joins with original syntax
- Non equi-join
- Using table aliases to avoid name clashes
- Inner Joins With ISO/ANSI Syntax
- Outer Joins
- Left outer joins
- Right outer joins
- Full outer joins
- Updating multiple tables simultaneously

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- **JOINS**

- Updating rows in one table based on a condition in another
- Updating rows in one table reading data from another
- Deleting from multiple tables simultaneously
- Deleting rows in one table based on a condition in another
- Exercises: Coding joins
- Overview of inner joins
- Cartesian product
- Inner joins with original syntax
- Non equi-join
- Using table aliases to avoid name clashes
- Inner Joins With ISO/ANSI Syntax
- Outer Joins
- Left outer joins
- Right outer joins
- Full outer joins
- Updating multiple tables simultaneously
- Updating rows in one table based on a condition in another
- Updating rows in one table reading data from another
- Deleting from multiple tables simultaneously
- Deleting rows in one table based on a condition in another
- Exercises: Coding joins

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- **SUBQUERIES**

- Types of subquery
- Multiple-column subqueries
- Correlated subqueries
- Using the ANY, ALL and SOME operators
- Using the EXISTS operator
- Subqueries as scalar expressions
- Inline views
- Converting subqueries to joins
- Using subqueries in updates and deletes
- Exercises: Coding subqueries
- Types of subquery
- Multiple-column subqueries
- Correlated subqueries
- Using the ANY, ALL and SOME operators
- Using the EXISTS operator
- Subqueries as scalar expressions
- Inline views
- Converting subqueries to joins
- Using subqueries in updates and deletes
- Exercises: Coding subqueries

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- **VIEWS**

- Why views are used
- Creating views
- View creation restrictions
- View algorithms
- Updateable views
- Altering and dropping views
- Displaying information about views
- Privileges for views
- Exercises: Using views
- Why views are used
- Creating views
- View creation restrictions
- View algorithms
- Updateable views
- Altering and dropping views
- Displaying information about views
- Privileges for views
- Exercises: Using views

- **IMPORT AND EXPORT**

- Exporting using SQL
- Privileges required to export data
- Importing using SQL
- Messages when loading data
- Privileges required to load data
- Exporting from the command line
- Mysqldump main options
- Importing from the command line
- Mysqlexport main options
- Exercises: Importing and exporting

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- **USER VARIABLES AND PREPARED STATEMENTS**
 - Creating User variables
 - User variables in a select
 - Prepared statements
 - The prepare statement
 - The execute statement
 - The deallocate statement
 - Using prepared statements in code, with connectors
 - Exercises: Using variables and prepared statements
- **INTRODUCTION TO STORED ROUTINES**
 - Types of stored routines
 - Benefits of stored routines
 - Stored routine features
 - Differences between procedures and functions
 - Introduction to the Block
 - Declaring variables and constants
 - Assigning values to variables
 - Definer rights and invoker rights
 - Using SELECT in stored routines
 - Altering and dropping stored routines
 - Obtaining stored routine metadata
 - Stored routine privileges and execution security
 - Exercises: Writing simple stored routines

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- **STORED ROUTINES - PROGRAM LOGIC**
 - The IF .. THEN .. ELSEIF construct
 - The CASE statement
 - The basic loop
 - The while loop
 - The repeat loop
 - The iterate statement
 - Nested loops
 - Exercises: Writing stored routines with program logic
- **STORED ROUTINES - EXCEPTION HANDLERS & CURSORS**
 - Dealing with errors using Exception handlers
 - Cursors
 - What is a cursor?
 - Cursor operations
 - Declaring cursors
 - Opening and closing cursors
 - Fetching rows
 - Status checking
 - Exercises: Writing stored routines with program logic
- **PROCEDURES WITH PARAMETERS**
 - Creating procedures with parameters
 - Calling Procedures With Parameters
 - Exercises: Writing stored routines with parameters
- **FUNCTIONS**
 - What is a function?
 - The create function statement
 - Executing functions
 - Executing functions from code
 - Executing functions from SQL statements
 - The deterministic and SQL clauses
 - Exercises: Writing functions

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- **TRIGGERS**
 - Trigger creation
 - Restrictions on triggers
 - The create trigger statement
 - Using the old and new qualifiers
 - Managing triggers
 - Destroying triggers
 - Required privileges
 - Exercises: Writing triggers
- **BASIC OPTIMIZATIONS**
 - Normalisation of data to third normal form
 - Using indexes for optimization
 - General query enhancement
 - Using Explain to analyze queries
 - Choosing an INNODB or MYISAM storage engine
 - Using MariaDB Enterprise Monitor in query optimization
 - Exercises: Making use of basic optimizations
- **MORE ABOUT INDEXES**
 - Indexes and joins
 - Exercises: Investigating indexes and joins

Course Duration:

5 Days

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