

PostgreSQL - basic course

Training objectives

After completing the training, the participant will acquire knowledge about the principles of functioning of a relational database, its components and the correlations between them. They will understand the role of the SQL language in users' interaction with the database, especially in extracting the desired information from the repository. Furthermore, through practical exercises, the user will gain the ability to formulate various types of queries of varying complexity and apply them appropriately to a specific situation. They will be able to edit data in the database and use transactions to process the data safely and consolidate the results.

Skills

After the course, the participant will be able to:

- Connect to a database using a client application,
- Perform simple queries to display data from single tables,
- Use single line functions to transform and convert data and group functions to aggregate entire sets as well as groups of records,
- Formulate complex queries involving joins of multiple tables and simple and correlated,
- Use aliases for columns and tables,
- Use subqueries for processing complex queries
- Manipulate data in tables: enter, modify and delete data,
- Use subqueries in manipulating data,
- Use transactions to approve or reject the effects of editing data.

Audience profile

The training is designed for people who use databases as a source of information when constructing a variety of reports, analyzing data and developing applications.

Requirements

The participants of the training are required to have basic knowledge of MS Windows environment.

Duration

2 days, 16 training hours

Training delivery method

The training is conducted in the form of consecutive training sessions divided into modules. Within a training module there is a theoretical part explaining a given issue, collectively and independently solved by the participant exercise and a block of questions and answers.

Theoretical and practical knowledge

Presentation of the objectives and scope of the training

Licensing principles - open source

Features distinguishing PostgreSQL from other database servers

PgAdmin application

Basics of the relational model of data organization

Concept of a database server

Server objects:

- Bases
- Tablespaces
- Schemas
- Roles

SQL language - selecting the data

Overlay software for performing queries

Creating simple queries

- Keywords
- Command syntax
- Using aliases for columns and tables

Sorting data

Using functions in queries

Single line functions

Group functions

Filtering on aggregation results

Selecting data from multiple tables

- Ways of joining tables

- Types of joins

Equi-join

Non-equi-join

Outer-join:

- left-joined,
- right-handed,
- both sides

Self-join

Collective exercises

Bulk operations on query results

- Sum
- Intersection
- Difference
- Subqueries
- The role of subqueries
- Query decomposition
- Location of subqueries

Simple subqueries

Multiple times nested subqueries

Correlated subqueries

Data Manipulation Language (DML)

- Insert
- Update
- Delete

DML operations based on query results

Transactions

- The idea of transactivity of operations
- Commit
- Rollback
- Savepoint

Repetition of material on key operations in SQL

Additional questions from participants

Training summary

Test

Survey

Development path

After the training, it is recommended to take advantage of:

- Training: "PostgreSQL - database implementation".
- Training: "PostgreSQL - database administration".
- <https://www.postgresql.org/docs/12/index.html>

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