

LE05: 13/03/2020

Master in Informatics and Computing Engineering
Database and Web Applications Laboratory
Instance: 2019/2020

Lecture #5 :: 13/03/2020

Goals

By the end of this class, the student should be able to:

- Describe the workload of the information system and the performance goals.
- Develop the Database Physical Scheme.
- Describe possible adjustments to the database to improve performance.
- Describe PostgreSQL indexing.
- Describe the possible adjustments to the logical schema of the database to improve performance.

Content

1. Introduction
 - Query optimisation
 - EXPLAIN query plans
2. Physical Database Schema
 - The workload
 - Queries
 - Updates
 - Performance
 - Physical Schema
3. Select indexes
 - Indexes
 - Clustering
 - Examples
 - Index-only plans
4. PostgreSQL
 - Indexes.
 - Full text search
5. Database tuning
 - Tuning the Relational Schema
 - Denormalisation
 - Tuning queries and views
 - Horizontal decomposition

Bibliography

- R. Ramakrishnan, J. Gehrke. *Database Management Systems*. McGRAW-Hill International Editions, 3rd Edition, 2003, ISBN=0-07-246563-8 (chapters 8, 12, 16, 20)
- The PostgreSQL Global Development Group. *PostgreSQL 9.4 Documentation*. Online in <http://www.postgresql.org/docs/9.4/static/index.html>, last accessed on March 2020

Materials

- Illustrations presented in class: [Database Indexes](#)
- Video recording of the class: [Shared Drive da UP](#)
- J. Correia Lopes, Sérgio Nunes. [Database Specification \(EBD\)](#), March 2020
- PostgreSQL. [Indexes](#), last accessed on March 2020
- PostgreSQL. [Examining Index Usage](#), last accessed on March 2020

Summary

- Database Physical Schema. Indexes. PostgreSQL. Tuning the Conceptual Schema: denormalisation, vertical decomposition, tuning queries and views. Database tuning. By André Restivo.¹⁾

— LBAW, 2019/20

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¹⁾

Esquema Físico. Índices. PostgreSQL. Afiinação do Esquema Lógico: desnormalização, decomposição horizontal, afinar interrogações. Afiinação da base de dados. Por André Restivo.

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Last update: **03/04/2020 11:59**

