Databases Project

2017/2018

Introduction

The aim of this project is to provide students with experience in developing database systems. The project is based in industry's best practices for software development, thus students will experience all the main stages of a common software project, from the very beginning to production release.

The **functional description** of the project is available in the **companion document** (in annex A) and it is common to 2 courses: BD and SD (both from the 3rd year of the LEI).

Objectives

At the end of this project students should be able to:

Understand how a database software development project is organized, planned and executed;

Master the creation of conceptual and physical data models for supporting and persisting application data;

Design, implement, verify and validate, and deploy a database system;

Install, configure, manage and tune a modern DBMS;

Understand client and server side programming in SQL and PL/SQL (or similar).

Groups

The project is to be done by groups of 3 students. Exceptionally, groups of two students may be accepted (groups of two have to be approved by the professor of the PL class). The members of each group should be enrolled in the PL classes of the same Professor.

Quality attributes for a good project

Your application must make use of:

(a) A transactional DBMS (the use of ORACLE is optional);

(b) A distributed architecture (e.g., client-server);

(c) SQL and PL/SQL, or similar;

(d) Adequate and relevant triggers, functions and procedures running on the DBMS side;

(e) Good strategies for managing transactions and concurrency conflicts; (f) Good error avoidance, detection and mitigation strategies; (g) A functional user interface; (h) Good documentation.

Your application must also respect the functional requirements defined in the companion document (EnunciadoProjectoAnexo) and execute without "visible problems" or "crashes".

To fulfill the objectives of this assignment you should be as creative as you want, provided you have included this list of features in your solution.

Milestones and deliverables

Midterm presentation – The team must present their work in the PL classes (privately, to the professor of the class) running from November 11st to November 17th.

Presentation with the following information:

- ✓ ·Name of the project
- ✓ ·Team members and contacts
- ✓ ·Brief description of the project and potential concurrency conflicts
- ✓ ·Provide a description of a potential solution if you already have one
- ✓ ·Core technologies: Programming Language, DBMS, Libraries, etc.

✓ ·Development plan: planned tasks, initial work division per team member, timeline and estimates

✓ **·ER diagram**

✓ ·Description of entities, attributes, integrity rules

✓ **·Relational data model** (tables)

Final delivery – December 10th - Deliveries must be submitted to ***Inforestudante*** until **23:55** in the day of the deadline. Each group must select a member for performing this task. All submissions must clearly identify the team and the students working in the project. Upload into *Inforestudante* the following materials and documents:

Document with:

User manual describing how users can interact with the application.

Installation manual describing how to deploy and run the software you developed

Final ER and Relational data models

Development plan: make sure you specify which tasks were done by each team member and the effort involved (e.g., hours)

All the relevant information to understand how the application is built

Source code and Scripts: PL/SQL and DB creation

Include the source code, scripts, executable files and libraries necessary for compiling and running the software (identify the used SGBD, do not upload its binaries)

DB creation scripts containing the definitions of tables, constraints, sequences, users, roles, permissions, triggers, functions, procedures and physical storage parameters (Next, Initial, PCTFree, PCTUsed, etc.)

Defense – December 11th to 16nd in lab class

Prepare a **10 min live presentation** of your software

Prepare yourself to answer questions regarding all deliverables and implementation details

Sign up for any available time slot for the defense in *Inforestudante*

The list of available slots will be released

Sign up until the final delivery due date

Notes

Do not start coding right away. Take time to think about the problem and to structure your development plan and design;

Always implement the necessary code for **error detection and correction**; Assure a **clean shutdown of your system** (no memory-leaks);

Plagiarism or any other kind of fraud will not be tolerated.

Anexo : Ver documento EnunciadoProjectoAnexo