**Project: "Library Manager with MySQL"**



**Learning Outcome:**

* Modify information stored in the database using wizards, graphical tools, and the data manipulation language.

**Evaluation Criteria:**

* **EC1:** Identification of tools and statements to modify database content.
* **EC2:** Insertion, deletion, and update of data in tables.
* **EC3:** Inclusion of information resulting from a query into a table.
* **EC4:** Design of scripts of statements to carry out complex tasks.
* **EC5:** Recognition of how transactions work.
* **EC6:** Partial or total rollback of changes produced by a transaction.
* **EC7:** Identification of the effects of different record locking policies.
* **EC8:** Adoption of measures to maintain data integrity and consistency.

**Project Description:**

This project involves developing a library manager with MySQL that allows for:

* **Catalog Maintenance:**
  + Registering books, authors, and categories.
  + Modifying and deleting information for books, authors, and categories.
* **Loan Management:**
  + Registering loans and returns.
  + Consulting the loan status.
  + Generating reports on loans.

**Technologies:**

* **Database:** MySQL
* **Tools:** MySQL Workbench, HeidiSQL
* **Data Manipulation Language:** SQL

**Project Schedule:**

**Week 1:**

* **Database design:** entities, relationships, attributes.
* **Database and table creation.**
* **Importing test data.**
* **Introduction to MySQL Workbench and HeidiSQL.**
* **Practice inserting, deleting, and updating data.**

**Week 2:**

* **Implementing library manager functionalities.**
* **Design and execution of SQL queries to obtain information.**
* **Script creation to automate complex tasks.**
* **Practice with transactions and concurrency control.**
* **Implementation of measures for data integrity and consistency.**
* **Project documentation.**

**Evaluation:**

Project evaluation will be continuous throughout the two weeks, considering the following aspects:

* **Identification of tools and statements (EC1):** Knowledge of SQL tools and statements for modifying information will be assessed. (5%)
* **Data modification (EC2):** Correct insertion, deletion, and update of data in tables will be verified.(15%)
* **Queries and results (EC3):** The ability to perform SQL queries and obtain desired information will be evaluated.(10%)
* **Scripts and automation (EC4):** The capacity to create scripts that automate complex tasks will be assessed.(10%)
* **Transactions (EC5 and EC6):** Understanding of transactions and the ability to rollback changes will be verified.(20%)
* **Record locking (EC7):** Knowledge of record locking policies and their impact will be evaluated. (15%)
* **Integrity and consistency (EC8):** Implementation of measures to maintain data integrity and consistency will be assessed.(20%)
* **Documentation (EC9):** The quality and completeness of project documentation will be evaluated.(5%)

**Additional Resources:**

* MySQL Tutorial: <https://dev.mysql.com/doc/refman/8.0/en/>
* MySQL Workbench: <https://dev.mysql.com/downloads/workbench/>
* HeidiSQL: <https://www.heidisql.com/>

**Expected Results by Week: Library Manager with MySQL Project**

**Week 1:**

* **Database Design:** Students will have a completed database design document outlining entities, relationships, and attributes for the library management system.
* **Database Setup:** A functional MySQL database will be created with the necessary tables based on the design document.
* **Data Import:** Sample data will be imported into the database to facilitate testing and practice.
* **Tool Introduction:** Students will be familiar with using MySQL Workbench or HeidiSQL for interacting with the database.
* **Data Manipulation:** Students will demonstrate proficiency in inserting, deleting, and updating data in the database tables using SQL statements.

**Week 2:**

* **Project Functionality:** The core functionalities of the library manager will be implemented, including:
  + Registering and managing books, authors, and categories.
  + Loan and return functionalities for library materials.
  + Ability to consult loan status and generate loan reports.
* **SQL Queries:** Students will design and execute SQL queries to retrieve specific information from the database.
* **Automation Scripts:** Students will create scripts using SQL statements to automate complex tasks within the library manager.
* **Transactions and Concurrency:** Students will understand the concept of transactions and be able to practice using them with data manipulation. They will also explore concurrency control mechanisms.
* **Data Integrity:** Measures will be implemented to ensure data integrity and consistency within the database.
* **Project Documentation:** A comprehensive project document will be created, outlining the design, functionalities, and usage of the library manager.