**Project Title:** Student Result Processing System  
**Technology Used:** MySQL  
**Domain:** Database Management System (DBMS)  
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**🔹 Introduction**

The **Student Result Processing System** is a database project developed using **MySQL** to efficiently manage and analyze students’ academic records. It automates result management by storing student details, courses, marks, grades, and computing GPA/CGPA. The system ensures accuracy, transparency, and fast retrieval of results for administrators, faculty, and students.

**🔹 Abstract**

This project focuses on designing a relational database to process and store student academic data systematically. It maintains multiple tables—Students, Courses, Semesters, and Grades—linked through primary and foreign keys. The system calculates **Semester GPA (SGPA)** and **Cumulative GPA (CGPA)** using stored procedures and triggers to ensure automatic updates. It also generates **rank lists** using window functions and provides **pass/fail statistics** for performance analysis.

The database provides an efficient and scalable solution for result processing, reducing manual errors and ensuring data consistency across semesters.

**🔹 Tools Used**

* **MySQL** – Database creation, data storage, and SQL queries
* **MySQL Workbench** – ER Diagram, query execution, and testing
* **VS Code / Notepad++** – SQL script editing
* **GitHub** – Project version control and hosting
* **Draw.io / dbdiagram.io** – Database ER diagram design

**🔹 Steps Involved in Building the Project**

1. **Database Design:**  
   Identified main entities — *Students, Courses, Semesters,* and *Grades*. Defined relationships using primary and foreign keys.
2. **Schema Creation:**  
   Created normalized tables in MySQL with appropriate constraints to maintain data integrity.
3. **Data Insertion:**  
   Inserted sample student, course, and marks data for testing result computations.
4. **GPA Calculation Logic:**  
   Implemented the GPA formula:

GPA=Σ(Grade\_Point×Course\_Credits)Σ(Course\_Credits)GPA = \frac{Σ(Grade\\_Point × Course\\_Credits)}{Σ(Course\\_Credits)}GPA=Σ(Course\_Credits)Σ(Grade\_Point×Course\_Credits)​

Created **stored procedures** and **triggers** to automatically calculate GPA and update results whenever new marks are inserted.

1. **Rank List & Statistics:**  
   Used **window functions** (RANK() OVER()) to generate semester-wise ranking. Aggregated pass/fail data using conditional SQL queries.
2. **Exporting Reports:**  
   Exported semester-wise results in CSV format using SELECT ... INTO OUTFILE.
3. **Visualization:**  
   Designed a **Database ER Diagram** showing relationships between all tables for documentation and presentation.

**🔹 Conclusion**

The Student Result Processing System successfully automates student result management by combining database design principles and advanced SQL operations. It minimizes human error, ensures faster result generation, and provides a foundation for further development, such as a web-based portal for student access.

The project demonstrates key database concepts — normalization, constraints, joins, stored routines, and triggers — making it an effective mini-project for real-world academic applications.

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