

# Student Academic Management System - SQL Project Report

## 1. Project Overview

This SQL project is a Student Academic Management System designed to track student details, academic courses, semesters, grades, GPA, and academic performance reports. The system includes features for automatic grading, GPA calculation, and pass/fail status evaluation.

## 2. Tables Description

The database consists of four primary tables:

- Students: Contains student ID, name, date of birth, and department.
- Courses: Contains course ID, course name, and credit hours.
- Semesters: Contains semester ID, name, and duration.
- Grades: Stores marks obtained by students, their grades, GPA, and references to students, courses, and semesters.

All tables use AUTO\_INCREMENT for primary keys and foreign keys to maintain relationships.

## 3. Data Insertion

Sample data is inserted into each table to demonstrate the functionality. Students, courses, and a semester are inserted. Grades are entered manually or can be generated using the trigger.

## 4. Queries Included

- Pass/Fail Report: Evaluates each student's result based on number of failed subjects.
- GPA & Ranking: Calculates weighted GPA and assigns rank per semester using window functions.
- Detailed Grade Report: Lists students' performance in each subject per semester.

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## 5. Trigger for Grade and GPA

A trigger named 'calc\_grade\_gpa' is created to run before insert on the Grades table. It automatically assigns grades (A-F) and GPA (9.0-0.0) based on marks, following defined thresholds.

## 6. Summary

This system allows educational institutions to effectively manage and evaluate student academic performance with automation. The use of triggers, joins, and ranking makes it robust and scalable.

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