University Database Management System

Prepared By

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Project Objectives: Building a Robust Academic Database

Relational Database Construction

Develop a comprehensive relational database system to meticulously track and manage student academic transcripts.

Core Data Management

Efficiently manage essential entities including academic Departments, Instructors, and Course offerings.

Analytical SQL Reporting

Generate a suite of 10 diverse analytical SQL reports to extract meaningful insights from the stored data.

Student Data Management: Comprehensive Tracking

- Store essential personal information: Full Name, Student ID, Social Security Number (SSN), and Birthdate.
- Utilize unique identifiers: Both Student Number and SSN serve as primary keys for individual student records.
- Maintain current contact and academic details: Track addresses, phone numbers, and declared major departments for each student.

Department and Instructor Management

Departmental Structure

Each department possesses a unique name, code, and detailed office information for administrative clarity.

Instructor Affiliation

Instructors are formally assigned to specific academic departments, ensuring proper organizational hierarchy.

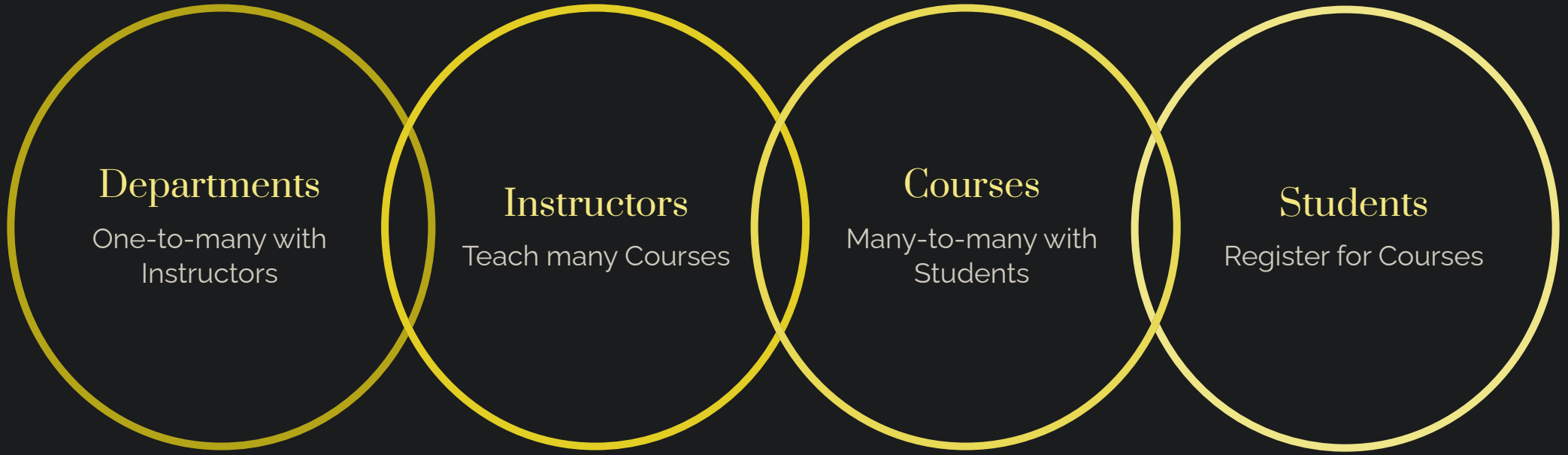
Financial Reporting

Precise recording of instructor salary data is maintained to facilitate accurate financial reporting and analysis.

Course and Section Details

- Courses are uniquely identified by a course number and include a detailed descriptive title.
- Sections track specific instances of a course, noting the assigned instructor, academic year, and specific course number.
- Each course section is further distinguished by the semester and the year it is offered, ensuring precise scheduling and record-keeping.

Key Relational Database Relationships



Understanding these relationships is crucial for maintaining data integrity and enabling complex queries within the university database.

Database Implementation: Technical Foundation

SQL Server Foundation

The database is robustly built using SQL Server, employing Primary and Foreign Keys to enforce referential integrity.

Automated Stored Procedures

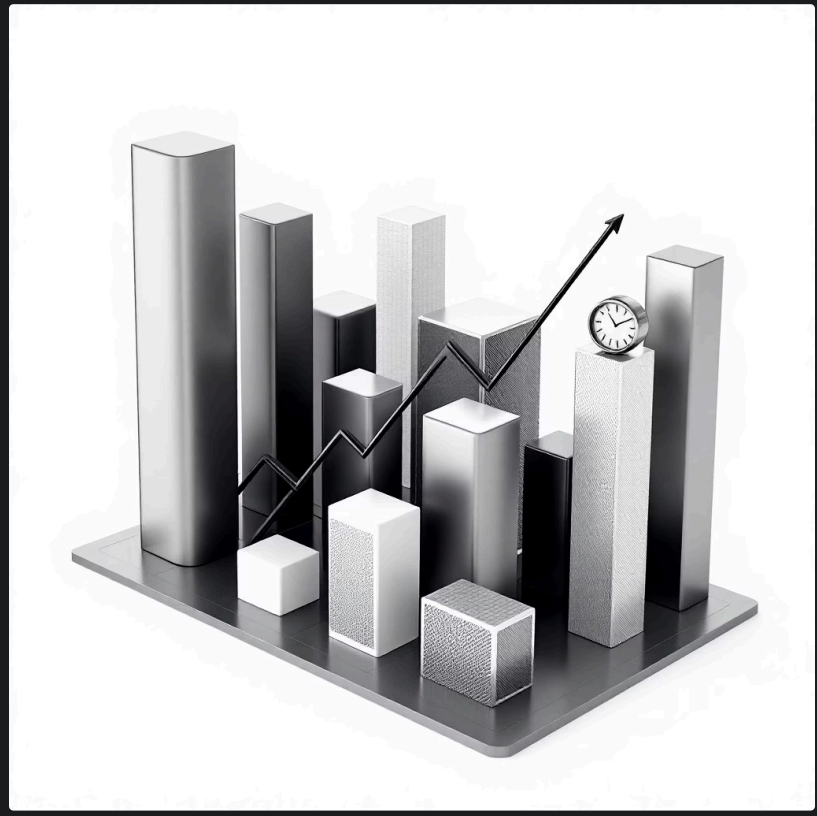
Efficiency is enhanced through the use of automated Stored Procedures for common database operations.

Optimized Data Constraints

Data quality is maintained and optimized with carefully applied constraints such as Unique and Not Null rules.

Analytical Reports: Departmental Insights

- Calculate the total count of instructors assigned to each academic department.
- Identify departments that offer the highest number of courses within the university curriculum.
- Generate comprehensive reports mapping each instructor to the specific courses they are currently teaching or have taught.



Analytical Reports: Student & Salary Analysis

Student Enrollment Tracking

Monitor and report on student enrollment figures per academic department to assess program popularity and resource allocation.

Instructor Salary Analysis

Conduct detailed salary analysis, including identifying maximum salaries and instructors earning above the average.

High-Participation Students

Identify and list students with high course participation (e.g., enrolled in more than three courses) for recognition or advising.

Conclusion: A Foundation for Academic Excellence

- The developed system ensures robust data integrity and provides easily accessible information for all stakeholders.
- Its scalable design is prepared to accommodate future university growth and evolving data management needs.
- This database delivers clear, actionable insights vital for effective academic management and strategic planning.