LGS Tracking Application

SE 374 Visual Programming – Final Project

Assist. Prof. Dr. Emre OLCA

Ömer Faruk ÖZER
21 07 06 028

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1. Project Objective

This project was developed to help students preparing for the LGS (High School Entrance System) exam to track their mock exam results. Students can record their exams, view their results, and monitor their performance graphically. Admin users can manage all student data and generate reports.

2. User Roles and Permissions

- **Admin:** Can add, edit, and delete students. Can view all students' exams and generate reports.
- **Student:** Can record, view their own exam results, and track them via performance graphs.

3. User Login System

Users (Admin and Student) log in to the system with a username and password. The user type is selected on the login screen.

4. Trial Exam Structure and Entry

- Exam subjects: Math, Science, Turkish, History, Religion, English
- The results of these subjects are recorded for each exam.
- Both Admins and Students can add their own exams to the system.

5. Used Technologies

Table 1. Technological materials used in the project

Component	Tool
Programming Language	C# (Windows Forms)
Database	MySQL
Charting Library	System.Windows.Forms.DataVisualization.Charting
PDF Generation	iTextSharp
Development Tools	Visual Studio

6. Application Interface
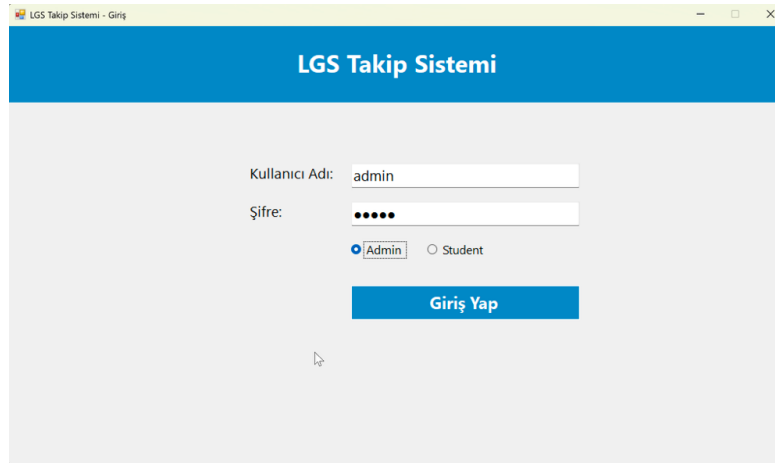
6.1 Midterm Features

Figure 1. Login screen where users select their role (Admin or Student) and authenticate using username and password.
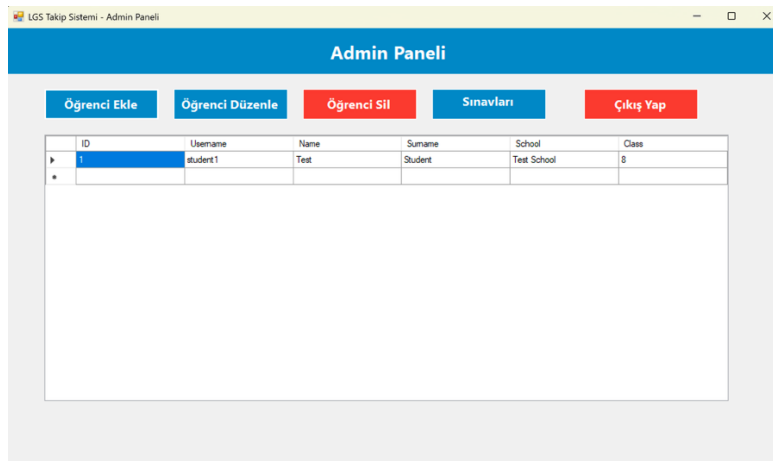

Figure 2. Admin panel allows user management such as adding, editing, deleting students, and viewing their exam records.
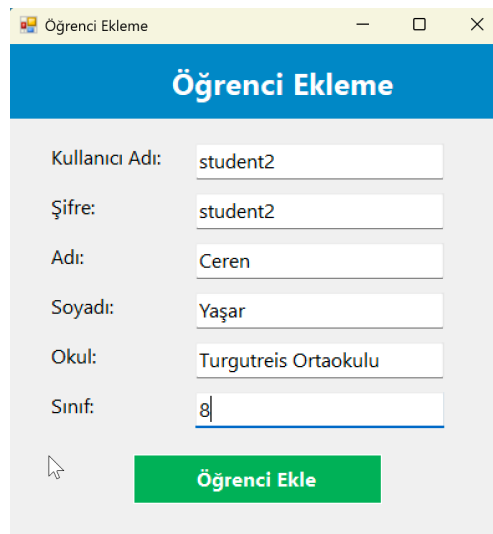

Figure 3. The Add Student screen allows admin users to register new students by entering their credentials and school details.
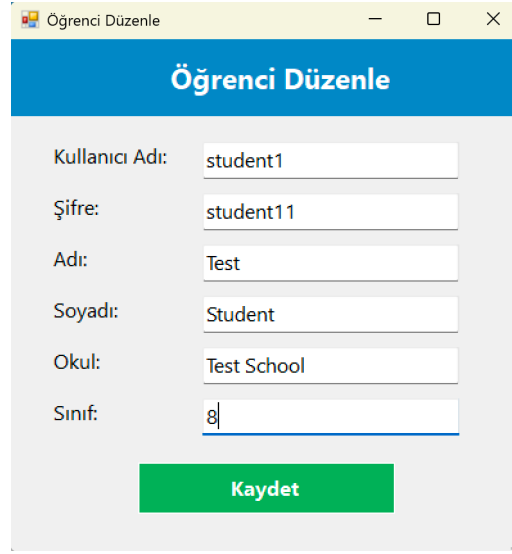
Figure 4. The Edit Student screen allows admin users to update existing student details such as username, password, and school information.
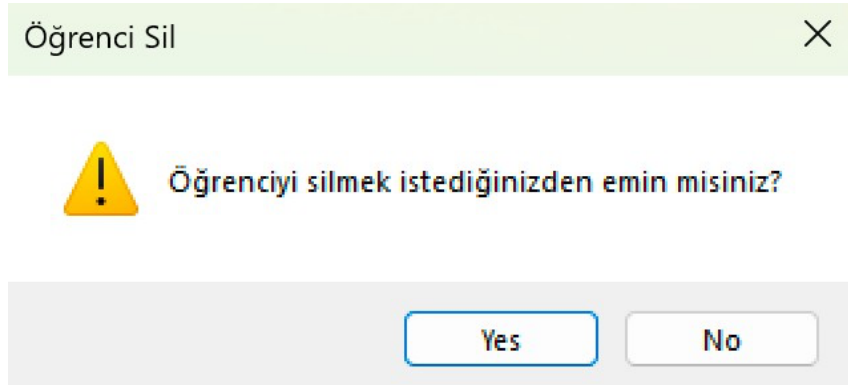

Figure 5. A confirmation dialog is displayed when attempting to delete a student, ensuring the admin confirms the action.
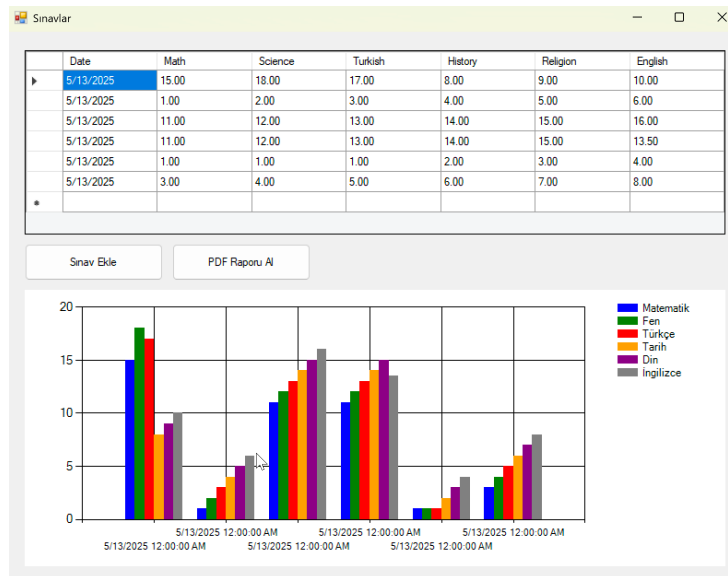
Figure 6. The Exams screen displays recorded exam data in a table and visualizes subject-wise scores in a bar chart.
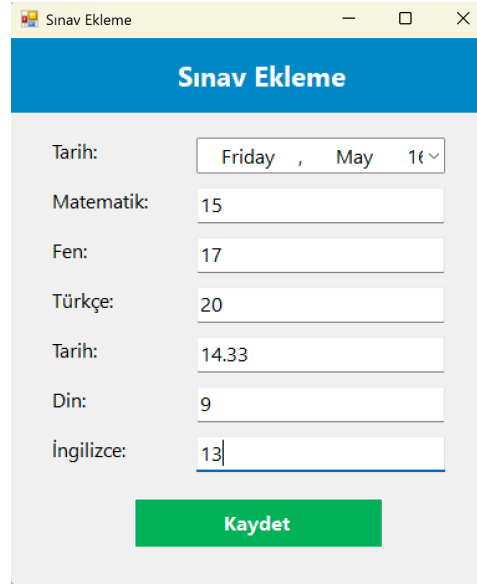

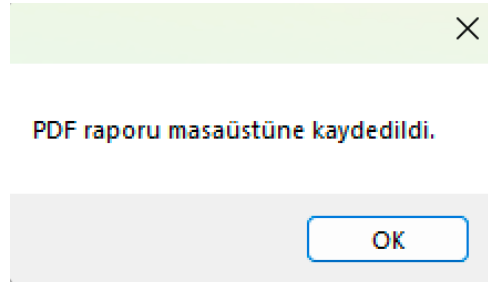**Figure 7.** The Add Exam screen allows users to enter subject scores and save the exam data to the system.

Figure 8. The confirmation message informs the user that the PDF report has been successfully saved to the desktop.
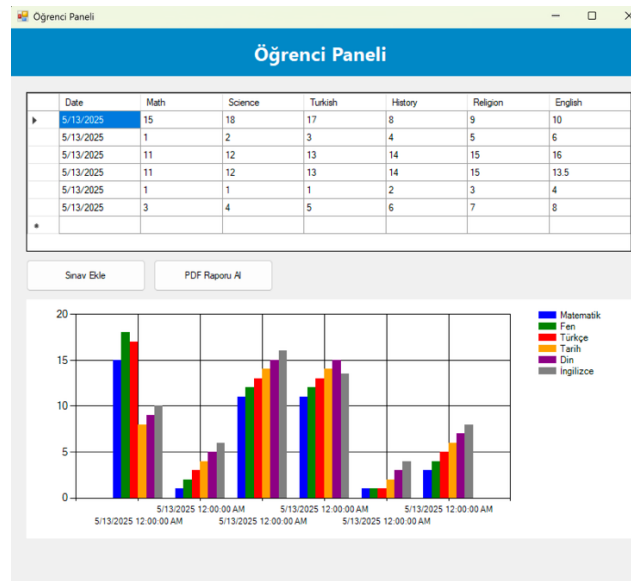

Figure 9. The Student Panel displays past exam results in a table and visualizes them with a performance chart.
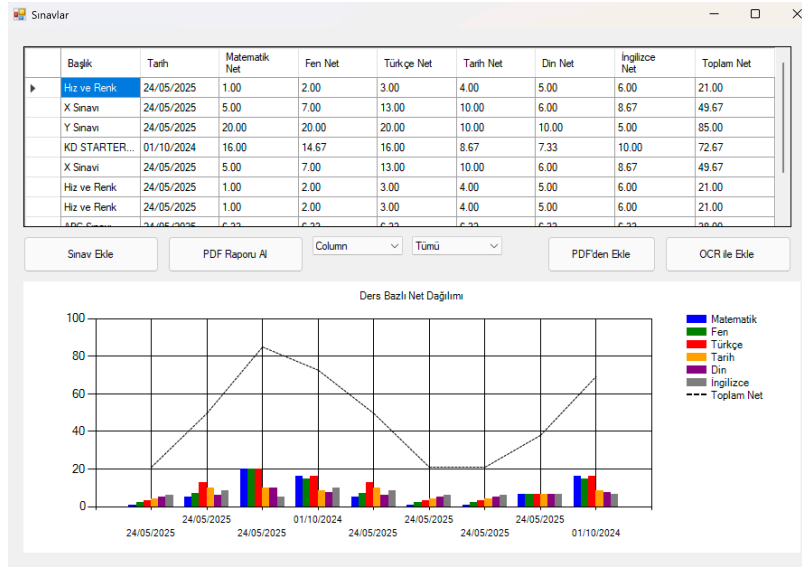
6.2 Final Features

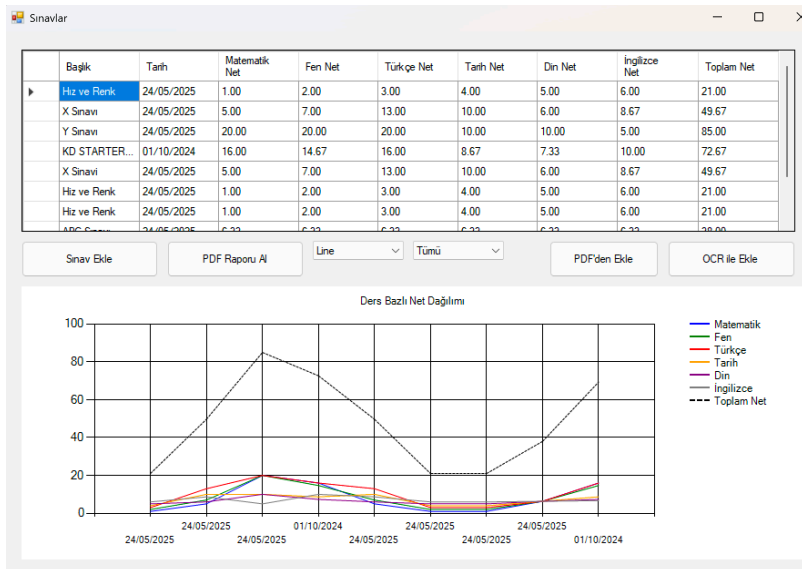**Figure 10.** The Admin panel has a two-option chart: line and column (column).

Figure 11. The Admin panel has a two-option chart: line and column (line).
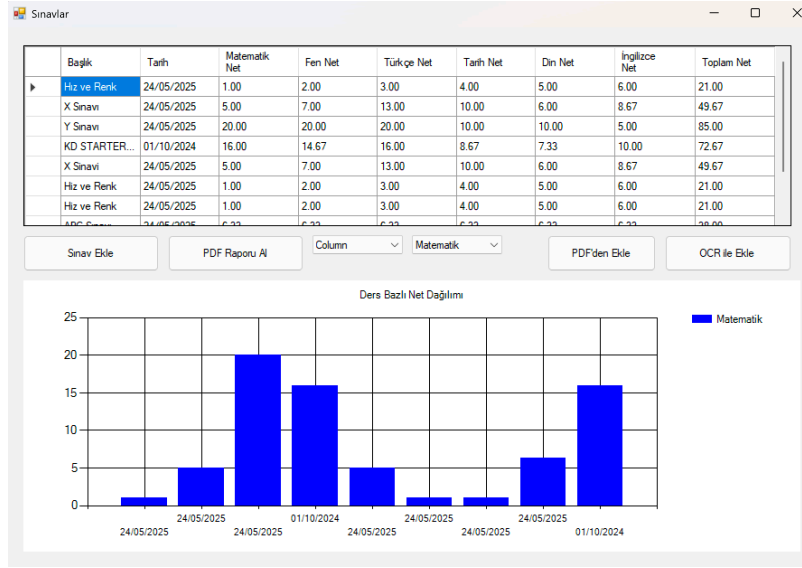
Figure 12. The admin panel and the student panel can now display course-based charts.

Figure 12. The admin panel can now perform "Add from PDF" and "Add via OCR" operations.

Figure 13. The exam addition panel now requires correct and incorrect answers and automatically calculates the net score.

6.3 Diagrams

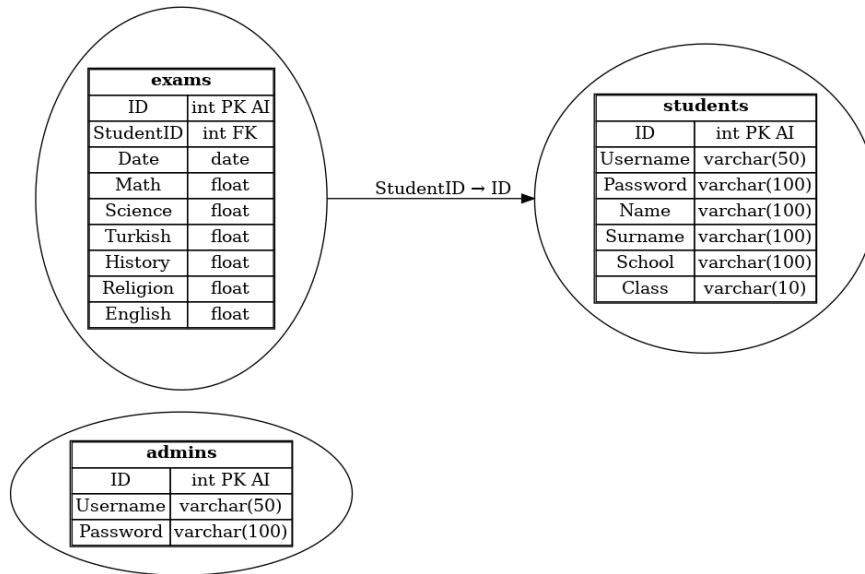**Figure 10.** The ER Diagram visualizes the structure of the database by showing tables, their fields, and relationships between them.
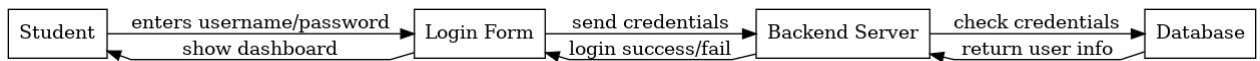

Figure 11. The Sequence Diagram illustrates the login flow by showing the interaction between the student, the Windows Forms interface, and the database.
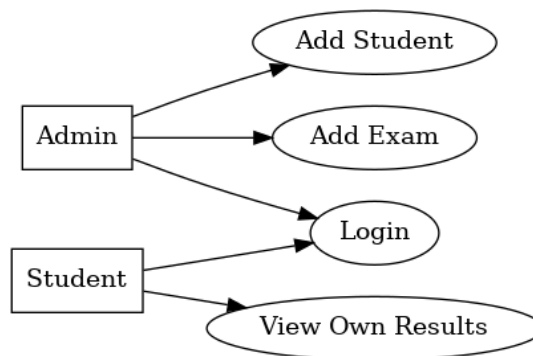

Figure 12. The Use-Case Diagram presents the core functionalities available to Admin and Student users in the system.

7. Implemented Features

- Admin and Student login system
- Admin: Add, edit, delete students
- Admin: Add exams manually, from PDF, and via Optical Form (OCR)
- Student: Add own exam manually or from PDF
- Student & Admin: View exam history
- Performance visualization with line/column charts
- Single and bulk PDF report generation (per exam or all exams)
- PDF parsing with multiple format support
- OCR-based optical form recognition (image to exam data)

8. Database Design
Students Table: ID, Username, Password, Name, Surname, School, Class
Exams Table:
ID, StudentID, Date, Title,
Math, Science, Turkish, History, Religion, English,
MathCorrect, MathWrong, ScienceCorrect, ScienceWrong, TurkishCorrect, TurkishWrong,
HistoryCorrect, HistoryWrong, ReligionCorrect, ReligionWrong, EnglishCorrect, EnglishWrong
Admins Table: ID, Username, Password

9. Issues Encountered and Solutions
- **Chart label and color confusion:** Colors and labels were standardized.
- **PDF Turkish character errors:** Implemented Turkish-to-ASCII character mapping before writing.
- **Tesseract OCR engine missing dependency error:** Added error handling with user notification.
- **Form control overlaps:** Adjusted coordinates and size for consistent layout across resolutions.

10. To-Do

All project requirements have been successfully implemented. All functional specifications, including user interface, data analysis, and reporting features, were fully developed and integrated.

11. Conclusion and Evaluation

The LGS Tracking Application provides a complete solution for managing, visualizing, and exporting students' mock exam data. It now supports manual entry, PDF parsing, and image-based OCR input. Both students and admins benefit from clear charts and clean PDF outputs. The system is stable and extensible for future improvements.