Python Final Project Report

Student Attendance System using graphs and GUI

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Introduction

This python project aims to simplify student attendance and streamline it for lecturers while also giving statistical reports on student attendance. The system enables users to efficiently manage module information, add students, and record and remove attendance entries using a Tkinter graphical user interface with the option of using face recognition depending on preference. Without the usage and dependency on complicated databases, all data—including students, modules, and attendance records—is kept in accessible CSV files, offering a lightweight and portable solution. The system also creates visual attendance reports using plotted graphs to facilitate improved monitoring and evaluation. This allows instructors to monitor trends across various lessons based on the number of lectures each week. All things considered, the program shows an effective and user-friendly method of handling attendance in educational settings.

What did I do in this project?

(Aland) My role and contribution to this project involved developing the plotting mechanism and assisting in the development of the logic of the operations, and brainstorming the core functionalities of the Student Attendance Management System. I was responsible for laying out the features of this system such as recording, removing attendance and making it user friendly and error prone, and structuring data storage through CSV files and the data each file includes. I developed the plotting features that generate visual attendance reports, ensuring that the system could effectively display the number of students attending each lecture to identify trends. Throughout the project, I worked on overseeing the development as well as testing each component, and ensuring that all features operated smoothly together to create a functional, scalable and user-friendly application.

(Daban) My main contribution to the project focused on designing and implementing the graphical user interface using Python's Tkinter library. I was

responsible for creating an intuitive, user-friendly interface that allows users to interact with the attendance system efficiently. Key GUI features I developed:

- Tab-based navigation: Organized the system into four main tabs (Add Student, Record Attendance, Remove Attendance, Attendance Report) using Tkinter's Notebook widget for clear separation of functionalities
- Dynamic form controls: Implemented Combobox dropdowns for department selection and a multi-select Listbox for modules that automatically filters based on the selected department, preventing enrollment errors
- Visual feedback system: Added color-coded indicators (green for active sessions, red for warnings) and informative messageboxes (showinfo, showerror, showwarning) to guide users through operations
- Data validation: Integrated form validation to ensure all required fields are completed before submission, with clear error messages for invalid inputs
- Safety features: Implemented confirmation dialogs for critical operations like deleting attendance records to prevent accidental data loss
- Professional layout: Used consistent grid layouts with appropriate padding (padx, pady) and organized spacing to create a clean, accessible interface.

My work ensured that the system is approachable for users of all technical backgrounds while maintaining a polished, professional appearance that makes attendance management straightforward and error-free.

(Majd) I was responsible for developing the underlying logic of the system to ensure accurate data handling and reliable performance. This included implementing the logic for adding, removing, and attendance records, as well as aggregating data for visual reports and implementing face recognition in the system. I also integrated error handling and validation routines to prevent invalid and duplicate entries and maintain consistency across CSV files. My work ensured that the system operates smoothly, processes data efficiently, and provides accurate attendance insights to instructors.