

CIA 4

PYTHON PROGRAMMING FOR BUSINESS ANALYTICS

Attendance Tracker

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Project Overview

The Smart Attendance Management System is a python based GUI application that is developed with Tkinter library. It allows faculty to effectively record, revise and examine student attendance records.

It is a useful business analytics application that is introduced by the system, which is subject-wise attendance tracking, integration with Excel, visualization of data with Matplotlib, and real-time editing of previous records.

Programming, data management, and analytics also extend the attendance-marking process but enable visualization of attendance trends to use them in better decision-making.

Tools & Libraries Used

<u>Library</u>	<u>Purpose</u>
Tkinter	To design GUI and interact with the user.
Pandas	To process data, analytics and control CSV/Excel.
Matplotlib	To visualize attendance analytics.
OS	To process files (to check and create attendance files)
Datetime	To auto fetch the date.

Features

- ➔ **Attendance Management on a subject basis:** The user has the option of marking attendance using pre-defined subjects (Strategic Management, Taxation Laws, etc.) to do so.

- **Class-wide Attendance Entry:** An attendance list with a preloaded list of classes allows the attendance to be marked on a single class with radio buttons (Default set to Present).
- **Auto Date Entry:** The date field automatically fills with the current date but it is flexible to allow editing.
- **Editable Past Records:** Attendance records of any subject or date can be easily changed by users who have an easy drop-down based interface.
- **Excel Integration:** Attendance data is kept in the CSV and Excel (.xlsx) format that will automatically update after each edit.
- **Analytics Visualization:** Bar charts are used to present the percentage of attendance per student, and as a result, the level of engagement is represented graphically.
- **Summary Dashboard:** Shows a table with a summary of the attendance of every student in each subject, and percentage as well.
- **Enhanced User Experience (UX):** The modern fonts, smooth scrolling, color scheme and organized buttons make it easier and more readable.

Interface Layout

- **Top Section:** Subject dropdown and date entry (auto-filled with current date)
- **Scrollable Frame:** List of students with “Present” and “Absent” radio buttons (default Present)
- **Bottom Section (Buttons):**
 - ◆ **Save Attendance** – Stores current data
 - ◆ **Edit Past Attendance** – Opens an edit window
 - ◆ **Show Analytics** – Displays graphical attendance visualization
 - ◆ **Show Summary** – Presents tabular analytics summary

Business Analytics Connection

The project fills the gap between business data management and analytics using Python tools in real-life operation efficiency.

The attendance data is the same as in business dashboards:

- The inputs are sent (gathered step) via the GUI.
- calculating insights with Processed (Pandas analytics), and
- Plot (Matplotlib) to be interpreted easily.

This is a reflection of information-oriented decision-making in corporate performance tracking.

Conclusion

The project is able to combine several Python libraries to create an analytical and functional GUI system.

It makes it easy to record attendance, allows real time editing of data and offers powerful visualization.

The Smart Attendance Management System therefore explains how programming, data analytics, and UI design can be merged into one intelligent business application in performance and attendance tracking.