

# Attendance Management System (Java Console App)

By

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# Project Overview

- Goal: Automate student attendance tracking using Java console app.
- Key Features:
  - Add students with unique IDs
  - Mark daily attendance (Present/Absent)
  - View attendance history for all students

# Student Class Design

- Fields: id, name, Map<String, String> attendance
- Methods:
  - markAttendance(date, status) – stores attendance record
  - showAttendance() – prints attendance log (date → status)
- Data structure: HashMap for fast lookups

# System Workflow

- Menu options: Add Student, Mark Attendance, View Attendance, Exit
- Uses List<Student> and unique studentIdCounter
- Loops until user exits

# Technical Highlights

- OOP: Clear separation of model (Student) and controller (AttendanceSystem)
- HashMap: Efficient date-status storage (average  $O(1)$  operations)
- Overwriting allowed when re-marking same date

# Future Enhancements

- Input validation for date format and status input
- Chronologically sorted attendance display
- Data persistence using files or databases
- GUI version using Swing/JavaFX