**Sprint 3: Attendance Tracking and Reporting**

**Objective**

Implement an automated attendance system with real-time tracking, reporting, and notifications.

**Tasks**

**Attendance Tracking:**

* Implement attendance marking through facial recognition.
* Integrate attendance data storage with the database.
* Ensure real-time updates for attendance records.

**Automated Reports Generation:**

* Develop a module to generate attendance reports.
* Enable Excel export functionality for reports.

**Notification System:**

* Send automated alerts to students and faculty for low attendance.
* Implement email notifications for attendance updates.

**Boost Attendance with Rewards:**

* To encourage students to maintain high attendance, introduce a reward-based system with badges and incentives.

**Admin & Faculty Access:**

* Provide role-based access to view, edit, and approve attendance records.
* Implement filtering and search features for attendance logs.

**Testing & Optimization:**

* Conduct unit and integration testing for attendance functionalities.

**Success Criteria:**

* Accurate attendance tracking and reporting.
* Automated notifications for students and faculty.

**Technologies used:**

* Implement face detection using OpenCV for real-time attendance marking.
* Store attendance records in MySQL using JDBC with efficient indexing.
* Reporting: Generate attendance reports in Excel using Apache POI.
* Send alerts via JavaMail API for low attendance.

**Retrospective**

**Goal:**

Develop a robust attendance tracking system with facial recognition, real-time reporting, and automated notifications.

**What Went Well:**

* Successfully integrated facial recognition for attendance marking.
* Automated report generation and real-time data updates were effective.
* Notifications for low attendance worked as expected.

**Challenges Faced:**

* Facial recognition struggled in low-light conditions and with occlusions (masks, glasses).
* High processing time when handling a large number of students simultaneously.

**Improvements:**

* Enhance the facial recognition model with better pre-processing techniques and dataset augmentation.
* Optimize algorithm efficiency to reduce processing time.