SMART AND SECURE ATTENDANCE SYSTEM USING RFID WITH MOTION-ACTIVATED READERS, AUTOMATED NOTIFICATIONS

Setup and Execution Guide for the Smart and Secure RFID-Based Attendance System

PROJECT SETUP GUIDE

This guide helps you install, configure, and run the **Smart and Secure Attendance System** using Flask (backend), HTML/CSS (frontend), and Arduino-based RFID integration.

PREREQUISITES

Before starting, ensure the following are installed:

- **Python 3.7+**
- **pip** (Python package manager)
- **Arduino IDE** (to flash the .ino file)
- **RFID module + Arduino board**
- **COM port availability** on your machine

FOLDER STRUCTURE

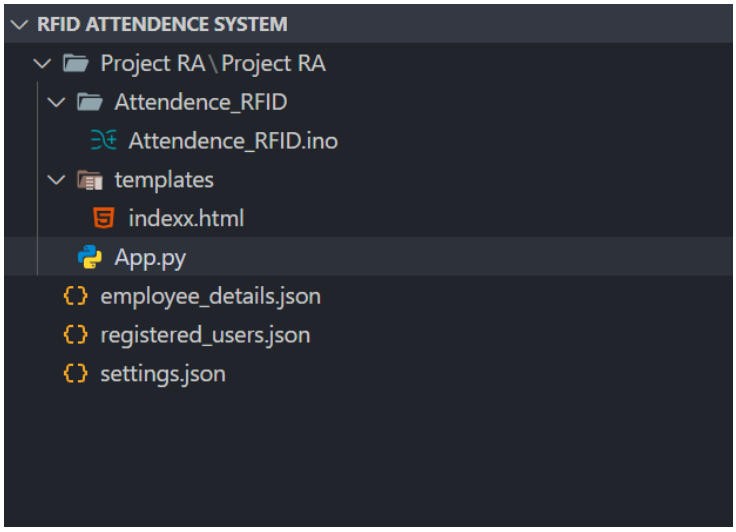

Fig : Project Folder Structure

Step 1: Flash the Arduino with RFID Code

1. Connect your **Arduino** to your PC.
2. Open Attendence_RFID.ino in the **Arduino IDE**.
3. Select the correct **board** and **COM port**.
4. Upload the code to your Arduino.
5. Open the **Serial Monitor** (set baud rate to 9600) to test if RFID reads correctly.

Step 2: Set Up the Python Environment

1. Open terminal/command prompt in the project directory.
2. Create a virtual environment (optional but recommended):

   python -m venv venv

   source venv/bin/activate # On Windows: venv\Scripts\activate
3. Install required dependencies:

   pip install flask flask-cors flask-sock openpyxl pyserial

Step 3: Start the Flask Backend

Run the following command:

python App.py

1. By default, Flask will run on **http://127.0.0.1:5000/**
2. The backend listens to the serial COM port defined (default is COM7). Change it in the settings or JSON if needed.

step 4: Access the Web Interface

1. Open your browser.
2. Navigate to: http://localhost:5000
3. Login credentials (hardcoded for demo):
    - **Username:** admin
    - **Password:** admin

Step 5: Register RFID Users

1. Go to **User Management** tab.
2. Scan an RFID card or auto-generate one.
3. Enter user details and click **Add User**.
4. The user is now ready to be marked present when scanned.

Step 6: Monitoring Attendance

1. Visit the **Dashboard** to see:
    - Total users
    - Present, Late, Absent counts
    - Real-time scan data
2. Go to **Reports** to generate attendance reports by date.
3. Click **Save Excel** to download logs.

Step 7: Email Notification Setup

To enable email:

1. Update the email/password in App.py under send_email() function.
2. Use a **Gmail App Password** if using Gmail.

3. Notifications will be sent for:
    - Late arrivals
    - Absences
    - Daily summaries

TROUBLESHOOTING

1. **RFID not detected?**
    a. Check if the COM port is correct.
    b. Verify baud rate in App.py and Arduino sketch (must match).
2. **Frontend not loading?**
    a. Ensure indexx.html is in the correct templates/ folder or rendered properly.
3. **WebSocket not working?**
    a. Confirm flask-sock is installed.