

Biometric Attendance System - Project Structure

This document describes the structure of the Python-Arduino biometric attendance system and provides instructions for setting up and running the project.

Project Structure

```
biometric-attendance-system/  
|  
├── arduino/  
│   └── fingerprint_controller.ino  
|  
├── python/  
│   ├── main.py  
│   ├── arduino_controller.py  
│   ├── database_manager.py  
│   ├── gui.py  
│   ├── config.py  
│   └── logger.py  
|  
├── data/  
│   └── attendance.db  
|  
└── logs/  
    └── attendance_YYYYMMDD.log
```

Requirements

Hardware Requirements

- Arduino UNO
- R307 Fingerprint Sensor
- USB cable for Arduino
- Computer with Python installed

Software Requirements

- Arduino IDE
- Python 3.6+
- Required Python packages:
 - PyQt5
 - pyserial

Setup Instructions

1. Arduino Setup

1. Connect the R307 fingerprint sensor to Arduino:
 - VCC to 5V
 - GND to GND
 - TX to Digital Pin 2
 - RX to Digital Pin 3
2. Install the required Arduino libraries:
 - Adafruit Fingerprint Sensor Library
 - In Arduino IDE: Sketch > Include Library > Manage Libraries...
 - Search for "Adafruit Fingerprint Sensor" and install
3. Open the Arduino IDE and load `fingerprint_controller.ino`
4. Upload the sketch to your Arduino UNO

2. Python Setup

1. Install required Python packages:

```
pip install PyQt5 pyserial
```

2. Create the project directory structure as shown above
3. Save each Python file in the appropriate location

3. Running the Application

1. First ensure the Arduino is connected to your computer via USB
2. Navigate to the project directory
3. Run the main application:

```
python python/main.py
```

Usage Guide

Enrolling Users

1. Go to the "Users" tab
2. Enter a user ID and name
3. Click "Enroll Fingerprint"
4. Follow the on-screen instructions to place and remove finger

Taking Attendance

1. Go to the "Attendance" tab
2. Click "Start Attendance Mode"
3. Have users place their fingers on the sensor
4. Attendance records will appear in the table

Generating Reports

1. Go to the "Reports" tab
2. Select start and end dates
3. Click "Generate Report"
4. Choose a save location for the CSV file

Troubleshooting

Connection Issues

- Ensure Arduino is properly connected via USB
- Check if the correct COM port is selected (will auto-detect in most cases)
- Verify the fingerprint sensor is properly connected to the Arduino

Fingerprint Reader Issues

- Make sure fingers are clean and properly placed on the sensor
- If recognition is poor, try re-enrolling the fingerprint

Database Issues

- If database corruption occurs, use the backup feature in the Settings tab
- Make regular backups of your database file