**RFID Offline Attendance Device – Technical Overview**

**1. Introduction**

The **RFID Offline Attendance Device** is a low-cost, standalone embedded system designed to log attendance without requiring a computer or internet connection. The system uses an RFID module to identify individuals and logs the time and date of each scan using a real-time clock (RTC). Data is stored in EEPROM and can later be retrieved via serial communication. This project was primarily developed with **minimal cost** and **maximum portability** in mind, making it ideal for schools, small offices, or event management.

**2. Design Objectives**

* ✅ **Offline Functionality** – Operates independently without PC or network.
* ✅ **Low Cost** – Uses widely available and inexpensive components.
* ✅ **Portability** – Powered by a power bank for mobility.
* ✅ **Simplicity** – Easy to set up, use, and maintain.

**3. Hardware Components**

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| **Component** | **Description** | **Approx. Cost (BDT)** |
| Arduino Nano | Main microcontroller unit | 350 |
| RC522 RFID Reader | Reads 13.56 MHz RFID cards | 150 |
| DS1307 RTC Module | Provides real-time timestamps | 100 |
| Buzzer | Audible feedback for successful scans | 20 |
| LED | Visual feedback indicator | 5 |
| EEPROM (Internal) | Built-in storage in Arduino Nano | - |
| Power Bank | Portable 5V power supply | 400 |
| **Total (Approx.)** |  | **1025 BDT** |

*Note: Costs are approximate and may vary depending on vendor/location.*

**4. System Workflow**

1. **Startup**: Arduino initializes RFID, RTC, EEPROM, and serial communication.
2. **Scan Detection**: RFID card is detected; UID is read.
3. **Timestamping**: DS1307 provides current time and date.
4. **Data Logging**: UID, name (if mapped), time, and date are stored in EEPROM.
5. **Feedback**: Buzzer beeps and LED blinks for confirmation.
6. **Data Retrieval**: Attendance data can be exported using a command via Serial Monitor.

**5. Sample Dataset Format**

ID number 1 ratan present time 16:50:50, Date = 15/10/17

ID number 2 masum present time 16:51:51, Date = 15/10/17

ID number 3 momin present time 16:51:51, Date = 15/10/17

**6. Advantages**

* 📦 **Cost-effective** – Built under 1100 BDT
* 🔋 **Portable** – Powered by standard power bank
* 🧠 **Smart Logging** – Time-based tracking using RTC
* 🔒 **Offline Storage** – Data is safe from internet interruptions