

PROJECT REPORT ON

# **RFID LIBRARY LOG-IN AND LOG-OUT**

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**MIZORAM UNIVERSITY, TANHRIL: AIZAWL**

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# HIGHER AND TECHNICAL INSTITUTE, MIZORAM

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## CERTIFICATE

This is to certify that the records of the course “*Minor Project*” with course code **BCA/5/CC/29**, submitted for partial fulfilment of the requirements for the **BCA V** Semester Examination, is an authentic and original work carried out under my supervision. The details of the student are given below:

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## **ACKNOWLEDGEMENT**

First, we would like to give thanks to God for guiding us throughout the process of our project, giving us with good health so that we are able to get this far.

We thank to our Principal Mr. Vuansanga Vanchhawng. We thank him for the support, encouragement and permission, which we enjoy freely in order to accomplish our project, and in this time of Pandemic situation.

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# **1. INTRODUCTION**

## **CONTENT**

- 
- **Objectives of the project**
    - **Overview of the project**

## **INTRODUCTION**

### **Objectives of the project**

The main objectives of this project is to create an user-friendly and easily accessible RFID Log-in Log-out system for the students.

### **Overview of the Project**

This project mainly focuses on creating a RFID log-in log-out which the students can be easily access in the library to register themselves, the system will provide different types like xerox button, printing button, borrow button, etc.

## **2. SYSTEM ANALYSIS**

### **CONTENT**

- 
- **Hardware Requirement**
  - **Software Requirement**

## **SYSTEM ANALYSIS**

### **Hardware Requirements**

1. Arduino Uno
2. RC522 (sensor)
3. Card & Tag
4. Jumper wire & Data Cable
5. LCD (displaying)
6. Breadboard
7. Buzzer
8. Button

### **Software Requirements**

1. C++
2. My SQL Database
3. Arduino IDE



### 3. DETAILS OF HARDWARE AND SOFTWARE

---

- **Hardware**

Arduino

Card & Tag

LCD

Breadboard

Buzzer

Button

Jumper wire & Data Cable

- **Software**

C++

My SQL Database

Arduino IDE

## HARDWARE

### Arduino:

We used the Arduino for,

#### 1. Learning and Prototyping

- **Educational Projects:** Ideal for beginners to learn programming and electronics.
- **Prototyping:** Engineers and hobbyists use it to quickly prototype and test ideas.

#### 2. Control Systems

- **Automation:** Controls systems like robotic arms, smart homes, and industrial processes.
- **Motor Control:** Drives stepper and DC motors in projects like RC cars, 3D printers, and CNC machines.

#### 3. Data Collection

- **Sensor Integration:** Collects data from sensors (e.g., temperature, humidity, motion, light).
- **Environmental Monitoring:** Monitors environmental conditions for weather stations or greenhouse automation.

#### 4. Communication

- **Wireless Communication:** Interfaces with modules like Bluetooth, Wi-Fi, and ZigBee for IoT projects.
- **Serial Communication:** Sends and receives data from computers or other microcontrollers.

#### 5. Interactive Devices

- **Wearables:** Powers wearable tech like LED gloves and fitness trackers.
- **Interactive Art:** Controls LEDs, sound modules, or motors for art installations.

## Card & Tag:

We used the Card & Tag for,

### Access Control

- **Building Access:** Used as keycards for secure entry into offices, homes, or restricted areas.
- **Event Tickets:** Provide access to concerts, conferences, or sports events.

### Asset Tracking

- **Inventory Management:** Track items in warehouses, retail stores, and libraries.
- **Logistics:** Monitor the movement of goods in supply chains.

### Identification

- **Personal ID:** Embedded in student IDs, employee badges, or passports.
- **Pet Identification:** Microchip tags in animals for veterinary purposes.

### Payment Systems

- **Contactless Payments:** Used in credit/debit cards, e-wallets, or transit systems (e.g., Metro cards).
- **Prepaid Systems:** Found in cafeteria cards or vending machine tags.

### Automation

- **Toll Collection:** Integrated into toll tags for seamless payment at toll booths.
- **Parking Management:** Automatically grants access to parking lots or tracks parking time.

## **Types of RFID Cards and Tags:**

**Passive Tags:** No internal power source; activated by an RFID reader's electromagnetic field.

**Active Tags:** Have a built-in battery, allowing for a greater read range.

**NFC Tags** (Near Field Communication): Used in smartphones for short-range communication.

## **LCD:**

Also, we used the LCD for,

### **1. Consumer Electronics**

- **Smartphones and Tablets:** Displays for user interfaces and visuals.
- **Televisions and Monitors:** Provides high-resolution screens for entertainment and work.
- **Wearable Devices:** Used in fitness trackers and smartwatches.

### **2. Computing Devices**

- **Laptops:** Primary display for visuals and user interaction.
- **Digital Cameras:** Display previews and settings.

### **3. Industrial and Commercial**

- **Control Panels:** Displays information in industrial machines and equipment.
- **POS Systems:** Used in cash registers and self-service kiosks.
- **Medical Equipment:** Monitors patient data and diagnostic imaging.

#### 4. Automotive and Transportation

- **Dashboard Displays:** Shows speed, fuel levels, and navigation data.
- **Infotainment Systems:** Entertainment and control interfaces in vehicles.

#### 5. Home Automation

- **Smart Home Displays:** Interfaces for smart devices and home automation systems.
- **Thermostats:** Show temperature and settings.

### BREADBOARD:

we used the breadboard for,

#### 1. Circuit Prototyping

- **Temporary Setup:** Assemble and test circuits without permanently soldering components.
- **Iterative Development:** Modify circuits quickly during the design phase.

#### 2. Learning and Education

- **Beginner-Friendly:** Ideal for students and hobbyists to learn basic electronics.
- **Experimentation:** Test how different components (resistors, LEDs, sensors) work together.

### 3. Component Testing

- **Individual Testing:** Check the functionality of components like transistors, diodes, and capacitors.
- **Debugging:** Identify issues in a circuit before moving to a permanent design.

### 4. Microcontroller Integration

- **Arduino/Raspberry Pi Projects:** Connect microcontrollers to sensors, actuators, and other peripherals.
- **Peripheral Testing:** Interface with LCDs, motors, or communication modules.

### 5. Temporary Circuit Assembly

- **Rapid Prototyping:** Test new ideas quickly for DIY projects or small-scale experiments.
- **Proof of Concept:** Demonstrate a working version of a circuit without committing to a final design.

## SOFTWARE

The coding which we are using is C++

```
#include <SPI.h>
```

```
#include <MFRC522.h>
```

```
#define SS_PIN 10 // Define the Slave Select pin for RC522
```

```
#define RST_PIN 9 // Define the Reset pin for RC522
```

```
MFRC522 mfrc522(SS_PIN, RST_PIN); // Create MFRC522 instance
```

```
void setup() {
```

```
    Serial.begin(9600); // Initialize serial communications with the PC
```

```
    SPI.begin();      // Init SPI bus
```

```
    mfrc522.PCD_Init(); // Init MFRC522 RFID reader
```

```
    Serial.println("Place your RFID card/tag near the reader...");
```

```
    Serial.println();
```

```
}
```

```
void loop() {
```

```
    // Look for a new RFID card
```

```
    if (!mfrc522.PICC_IsNewCardPresent()) {
```

```
        return;
```

```
}
```

```
// Select one of the cards
```

```
if (!mfrc522.PICC_ReadCardSerial()) {  
    return;  
}
```

```
// Show UID on serial monitor
```

```
Serial.print("UID tag: ");  
String content = "";  
for (byte i = 0; i < mfrc522.uid.size; i++) {
```

```
Serial.print(mfrc522.uid.uidByte[i] < 0x10 ? " 0" : " ");  
    Serial.print(mfrc522.uid.uidByte[i], HEX);  
    content.concat(String(mfrc522.uid.uidByte[i] < 0x10 ? " 0" : " "));  
    content.concat(String(mfrc522.uid.uidByte[i], HEX));  
}
```

```
Serial.println();  
Serial.print("Tag UID: ");  
Serial.println(content);  
Serial.println("Duata");  
{
```



```
Serial.println();  
Serial.print("Tag UID: ");  
Serial.println(content);  
Serial.println("Alpha");  
}  
  
delay(1000); // Delay to avoid multiple reads of the same card  
}
```

## **5. FUTURE ENHANCEMENT**

- **LCD**
- **BREADBOARD**
- **BUZZER**
- **BUTTON**

## **FUTURE ENHANCEMENT:**

We will be continue working in the future, based on the given above points, in the next semester we will be finish our project for now this is all the progress we had

- **LCD**
- **BREADBOARD**
- **BUZZER**
- **BUTTON**

This given points are to be done in the future

## **6. CONCLUSION**

This project is basically designed to be used by the students. This chapter seeks to conclude the work that has been done, and to present the areas that mark to the completion of this project work.

This project work is the compilation of the ideas, views and thoughts of our group, Group 3 of 5th Semester BCA, 2024.

We are deeply conscious of the fact that this project would neither have been undertaken nor pursued and completed but for the tremendous support that we received from Mr. H. Lalruatkima, our Project Guide and K. Lalmuanpuia Head of Department, who not only give us their full support but provide us with all kinds of necessities that we required in the project we are working.

We would also like to place and record our sincere thanks and gratitude to our Principal, Mr. Vuansanga Vanchhawng, for extending his full support and consent to this project undertaken.