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Project Proposal: RFID Access System with LCD and Keypad Authentication

Objective:

Develop an RFID-based authentication system using an Arduino Uno. The system will check an RFID card/tag, display the number of remaining attempts on an I2C LCD display, and, if authentication fails, prompt the user to enter a code via the 9-digit keypad.

Components Required:

- **Arduino Uno**
- **RFID Module (e.g., MFRC522)**
- **I2C LCD Display (16x2 or 20x4)**
- **9-Digit Keypad**
- **Buzzer** (for alerts)
- **LEDs** (for visual status)
- **Breadboard & Jumper Wires**

Functionality:

1. **RFID Authentication:**
    - User scans an RFID card/tag.
    - If the card is authorized, access is granted (e.g., LED turns green, buzzer beeps).
    - If unauthorized, the display shows the number of attempts left.
2. **Keypad Authentication (After RFID Failure):**
    - If the RFID scan fails, the system prompts the user to enter a backup PIN using the keypad.
    - If the correct PIN is entered, access is granted.
    - If incorrect, the attempt counter decreases.

3. **Security Measures:**
    - After a certain number of failed attempts, the system locks for a set time or triggers an alert.

Expected Outcome:

A functional RFID authentication system that allows entry via RFID but provides a backup PIN entry method for failed scans. The LCD will display real-time feedback, enhancing user experience.