**smart lock security system**

**Components Required**

1. Arduino Uno
2. 4x4 Keypad
3. 16x2 LCD with I2C adapter (optional for reducing pin usage)
4. Servo Motor
5. Jumper wires
6. Resistor (10kΩ for the contrast pin if not using I2C LCD)
7. Breadboard
8. External power supply (optional, if needed for servo)

**Circuit Connections**

1. **Keypad**
   * Connect the keypad rows and columns to Arduino digital pins.  
     Example: Rows (R1-R4) → D2-D5, Columns (C1-C4) → D6-D9.
2. **LCD**
   * If using I2C: Connect SDA to A4, SCL to A5.
   * Without I2C: Connect pins RS, E, D4-D7 to Arduino digital pins, VCC to 5V, GND to GND, and a potentiometer to adjust contrast.
3. **Servo Motor**
   * Connect signal wire to a PWM pin (e.g., D10), power to 5V, and ground to GND.

**Code Overview**

1. **Keypad Input**: Capture user input for password entry.
2. **Password Verification**: Compare the entered password with a predefined one.
3. **LCD Display**: Show messages like "Enter Password", "Access Granted", or "Access Denied".
4. **Servo Motor Control**: Rotate to open or lock positions based on password verification.

**Steps**

1. **Set up the components** on a breadboard and connect as described.
2. **Upload the code** to the Arduino Uno.
3. Power the system and test:
   * Input the password via the keypad.
   * Correct password rotates the servo to unlock; incorrect password displays "Access Denied".
4. Adjust servo positions and messages as required.

Project Link :- https://wokwi.com/projects/417727769709433857