DOOR LOCK SYSTEM

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CONTENT

INTRODUCTION

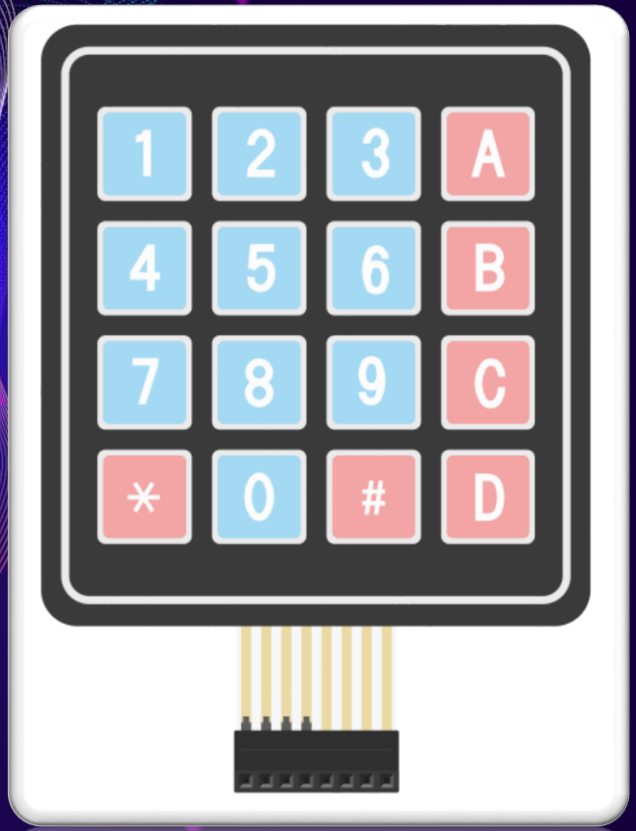
smart lock

A smart lock is an electronic and mechanical locking device that opens wirelessly with an authorized users’ authentication.

NEED OF TOPIC

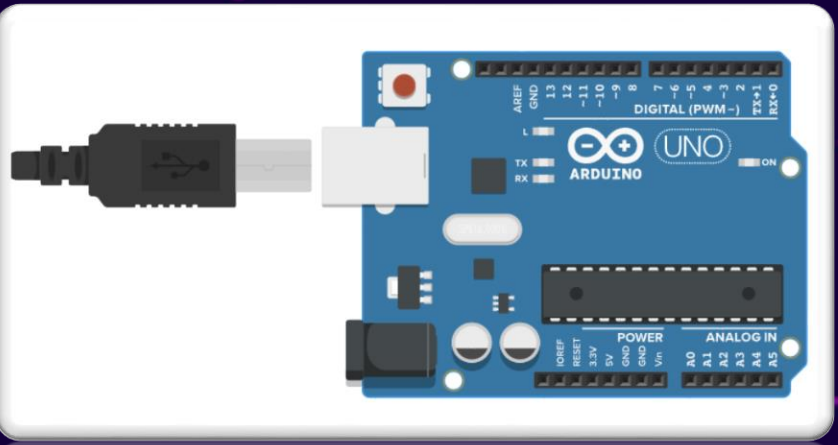
1 . To Increase Accessibility Without Compromising Security .
2 . Simplify Home Security .
3 . To have So Many Options to Lock and Unlock Your Property .

COMPONENTS

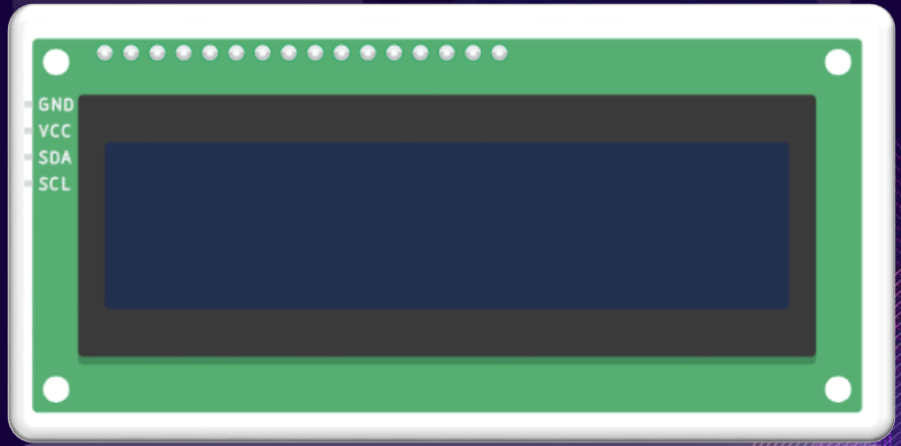


Keypad 4 x 4

Micro Servo



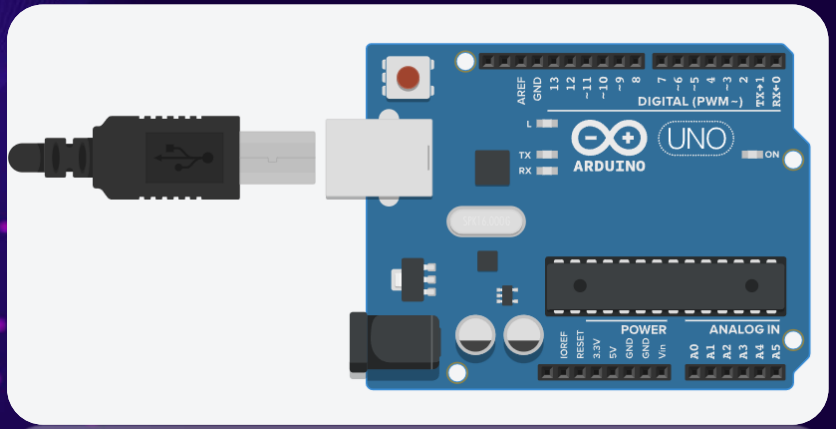
Arduino Uno



LCD 16 x 2 (I2C)

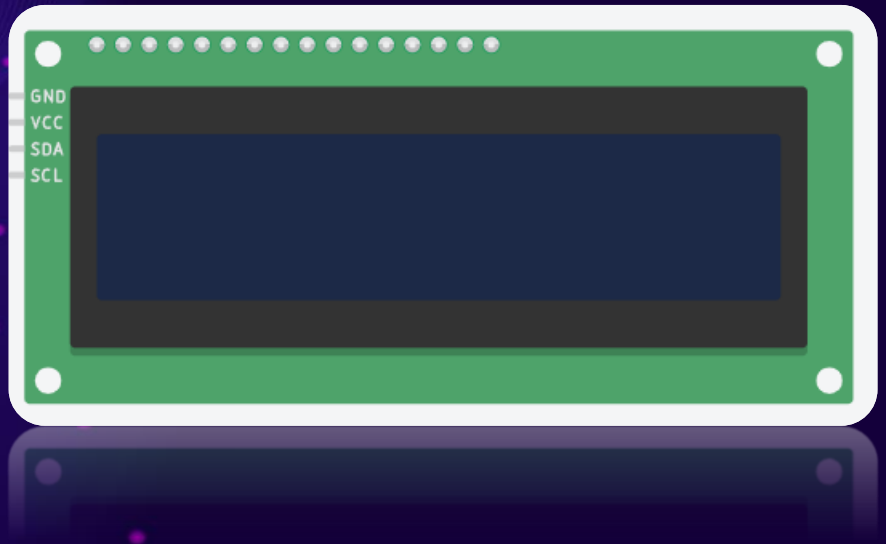
COMPONENT INFORMATION

Arduino Uno



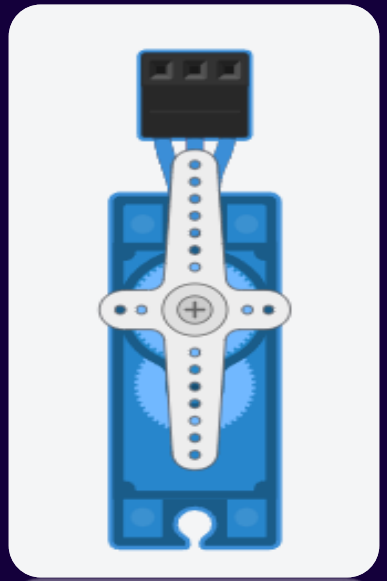
The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output (I/O) pins

LCD 16×2



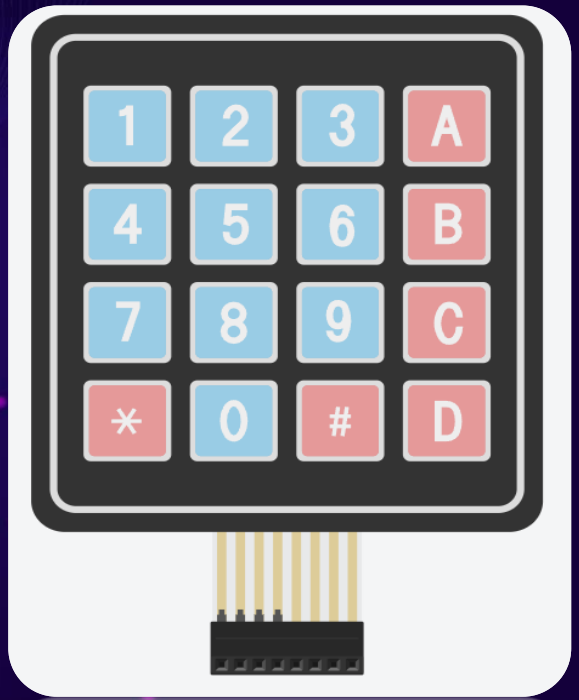
An electronic device that is used to display data and the message is known as LCD 16×2. As the name suggests, it includes 16 Columns & 2 Rows so it can display 32 characters (16×2=32)

Micro Servo



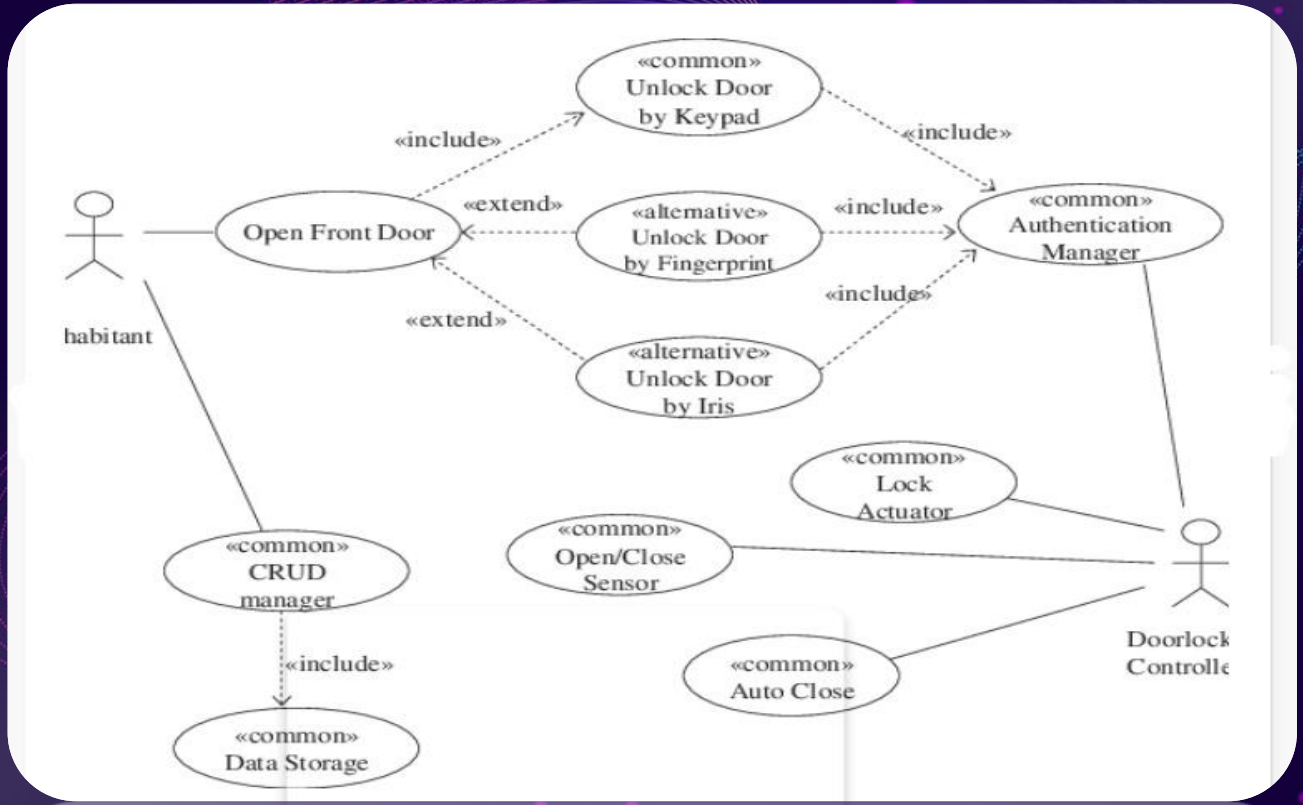
Micro Servo Motor SG90 is a **tiny and lightweight** server motor with **high output power**. Servo can rotate approximately **180** degrees (90 in each direction)

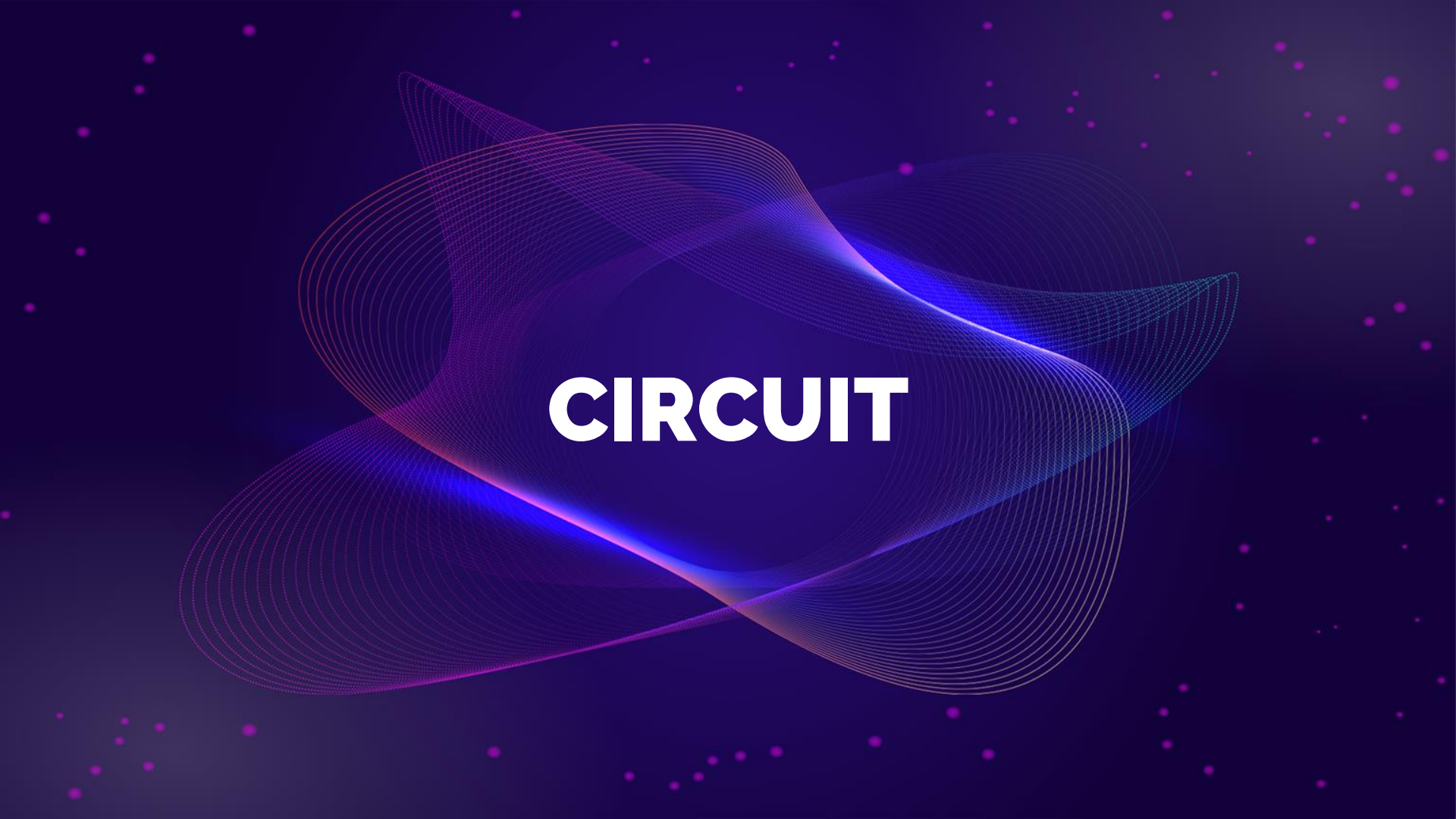
Keypad 4 x 4

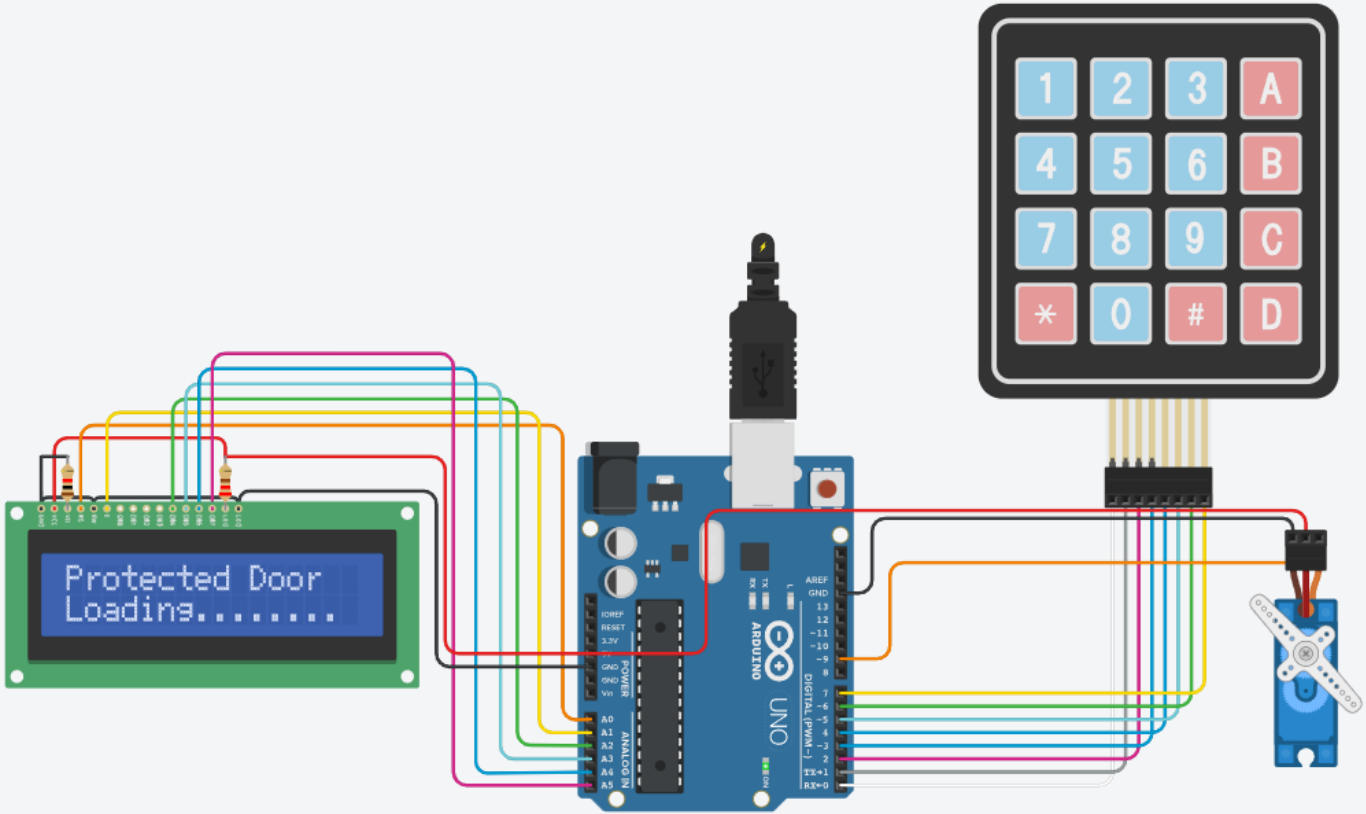


The 4x4 matrix keypad is a simple mechanism that resembles the numeric input on your computer keyboard, except that it has an additional '*,' '#' and 4 other auxiliary buttons that can be used for various functions in the application.

USE CASE DIAGRAM




CIRCUIT


1 2 3 A
4 5 6 B
7 8 9 C
* 0 # D
Protected Door
Loading.....
ARDUINO
UNO


CODE

```
#include <Keypad.h>
#include <LiquidCrystal.h>
#include <Servo.h>

#define Password_Length 5

Servo myservo;
LiquidCrystal lcd(A0, A1, A2, A3, A4, A5);

int pos = 0;

char Data[Password_Length];
char Master[Password_Length] = "1234";
byte data_count = 0, master_count = 0;

bool Pass_is_good;
bool door = false;
char customKey;


/*---preparing keypad---*/

const byte ROWS = 4;
const byte COLS = 4;
char keys[ROWS][COLS] = {
  {'1', '2', '3', 'A'},
  {'4', '5', '6', 'B'},
  {'7', '8', '9', 'C'},
  {'*', '0', '#', 'D'}
};


byte rowPins[ROWS] = {0, 1, 2, 3};
byte colPins[COLS] = {4, 5, 6, 7};

Keypad customKeypad( makeKeymap(keys), rowPins, colPins, ROWS, COLS);


/*--- Main Action ---*/
void setup()
{
  myservo.attach(9, 2000, 2400);
  ServoClose();
  lcd.begin(16, 2);
  lcd.print("Protected Door");
  loading("Loading");
  lcd.clear();
}


void loop()
{
  if (door == true)
  {
    customKey = customKeypad.getKey();
    if (customKey == '#')
    {
      lcd.clear();
      ServoClose();
      lcd.print("Door is closed");
      delay(3000);
      door = false;
    }
  }
  else
    Open();

}

void loading (char msg[]) {
  lcd.setCursor(0, 1);
  lcd.print(msg);

  for (int i = 0; i < 9; i++) {
    delay(1000);
    lcd.print(".");
  }
}

void clearData()
{
  while (data_count != 0)
  {
    Data[data_count--] = 0;
  }
```

```
  return;
}

void ServoClose()
{
  for (pos = 90; pos >= 0; pos -= 10) {
    myservo.write(pos);
  }
}

void ServoOpen()
{
  for (pos = 0; pos <= 90; pos += 10) {
    myservo.write(pos);
  }
}

void Open()
{
  lcd.setCursor(0, 0);
  lcd.print("Enter Password");

  customKey = customKeypad.getKey();
  if (customKey)
  {
    Data[data_count] = customKey;
    lcd.setCursor(data_count, 1);
    lcd.print(Data[data_count]);
    data_count++;
  }

  if (data_count == Password_Length - 1)
  {
    if (!strcmp(Data, Master))
    {
      lcd.clear();
      ServoOpen();
      lcd.print(" Door is Open ");
      door = true;
      delay(5000);
      loading("Waiting");
      lcd.clear();
```

```
      lcd.print(" Time is up! ");
      delay(1000);
      ServoClose();
      door = false;
    }
    else
    {
      lcd.clear();
      lcd.print(" Wrong Password ");
      door = false;
    }
    delay(1000);
    lcd.clear();
    clearData();
  }
}
```

APPLICATIONS

- Convenient for Elderly and Physically Impaired People
- Ensures You a High Security
- It Detects Your Presence
- Send e Keys to Your Near and Dear Ones
- You simply need a smartphone for that

CONCLUSION

Smart home locks definitely offer some perks like security and convenience, but you also need to understand fully the potential issues it comes with before going ahead and installing them.

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THANK YOU