#include <Servo.h>

#include <LiquidCrystal.h>

#include <Keypad.h>

const byte ROWS = 4; //four rows

const byte COLS = 4; //three columns

char keys[ROWS][COLS] = {

{'7','8','9', '/'},

{'4','5','6', '\*'},

{'1','2','3', '-'},

{'o','0','=', '+'}

};

byte rowPins[ROWS] = {31, 33, 35, 37}; //connect to the row pinouts of the keypad

byte colPins[COLS] = {23, 25, 27, 29}; //connect to the column pinouts of the keypad

const int rs = 13, en = 12, d4 = 8, d5 = 9, d6 = 10, d7 = 11;

Keypad keypad = Keypad( makeKeymap(keys), rowPins, colPins, ROWS, COLS );

LiquidCrystal lcd(rs, en, d4, d5, d6, d7);

Servo myservo; // create servo object to control a servo

const byte doorLedPin = 50, buzzPin = 53, servoPin = 7 ;

byte state = 0;

String prompts[] = {"Pass: ", "Door Open", "ChPass: ", "ChTime: "};

String inputBuffer, password = "1234";

bool timerOn = false;

int timerTime = 10;

long t0 = millis();

void setup() {

Serial.begin(9600);

myservo.attach(servoPin);

myservo.write(0);

lcd.begin(16, 2);

lcd.clear();

lcd.setCursor(0, 0);

lcd.print(prompts[state]);

pinMode(doorLedPin, OUTPUT);

pinMode(buzzPin, OUTPUT);

}

void pPrompt() {

lcd.clear();

lcd.setCursor(0, 0);

lcd.print(prompts[state]);

inputBuffer = "";

}

void buzz() {

digitalWrite(buzzPin, HIGH);

delay(200);

digitalWrite(buzzPin, LOW);

}

void open\_door() {

t0 = millis();

timerOn = true;

digitalWrite(doorLedPin, HIGH);

buzz();

myservo.write(180);

}

void lock\_door() {

myservo.write(0);

digitalWrite(doorLedPin, LOW);

timerOn = false;

state=0;

pPrompt();

buzz();

}

float calc\_time() {

if (!timerOn) {

return 0;

}

long nowT = millis();

float diff = (float) timerTime - ((nowT - t0) / 1000.0);

if (diff <= 0) {

lock\_door();

diff = 0;

}

return diff;

}

void password\_entered() {

lcd.setCursor(0, 0);

if (inputBuffer == password) {

lcd.print("Correct password");

state = 1;

open\_door();

} else {

state = 0;

lcd.print("Wrong password");

}

delay(1000);

}

void loop() {

float timer = calc\_time();

lcd.setCursor(0, 1);

lcd.print("Timer: " + String(timer) + " ");

char key = keypad.getKey();

if (key){

lcd.setCursor(prompts[state].length() + inputBuffer.length(), 0);

lcd.print(key);

if (key == '=')

{

if (!timerOn) {

// Safe is locked - should enter password

password\_entered();

} else if (state == 2) {

// Change password

password = inputBuffer;

state = 1;

} else if (state == 3) {

// Change timer

timerTime = inputBuffer.toInt();

state = 1;

}

pPrompt();

} else if (key == '\*' && timerOn) {

state = 2;

pPrompt();

} else if (key == '-' && timerOn) {

state = 3;

pPrompt();

} else if (key == 'o' && timerOn) {

lock\_door();

} else

inputBuffer += key;

}

delay(50);

}