**#include <Wire.h>**

**#include <LiquidCrystal\_I2C.h>**

**#include <Keypad.h>**

**// LCD setup**

**LiquidCrystal\_I2C lcd(0x27, 16, 2);**

**// Keypad setup**

**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] = {2, 3, 4, 5};**

**byte colPins[COLS] = {6, 7, 8, 9};**

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

**// Other components**

**int relayPin = 10;**

**int potentiometerPin = A0;**

**int ledPin = 11;**

**void setup() {**

**lcd.begin(16, 2);**

**lcd.backlight();**

**pinMode(relayPin, OUTPUT);**

**digitalWrite(relayPin, LOW);**

**pinMode(ledPin, OUTPUT);**

**digitalWrite(ledPin, LOW);**

**}**

**void loop() {**

**// Read keypad**

**char key = keypad.getKey();**

**if (key) {**

**lcd.clear();**

**lcd.setCursor(0, 0);**

**lcd.print("Key Pressed:");**

**lcd.setCursor(0, 1);**

**lcd.print(key);**

**if (key == '\*') {**

**digitalWrite(relayPin, HIGH); // Activate relay**

**} else if (key == '#') {**

**digitalWrite(relayPin, LOW); // Deactivate relay**

**}**

**delay(100);**

**}**

**// Read potentiometer & adjust LED brightness**

**int potValue = analogRead(potentiometerPin);**

**int ledBrightness = map(potValue, 0, 1023, 0, 255);**

**analogWrite(ledPin, ledBrightness);**

**}**