```
#include <TM1637Display.h>
#include <LiquidCrystal.h>
#include <Keypad.h>

// Pin Definitions
#define CLK_PIN         10
#define DIO_PIN         9
#define LED_RED_PIN     38
#define LED_YELLOW_PIN  40
#define LED_GREEN_PIN   42
#define BUZZER_PIN      44
#define PIN_CORRECT     272

// Keypad Configuration
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] = {22, 24, 26, 28};
byte colPins[COLS] = {30, 32, 34, 36};
Keypad keypad = Keypad(makeKeymap(keys), rowPins, colPins, ROWS, COLS);

TM1637Display display(CLK_PIN, DIO_PIN);
LiquidCrystal lcd(11, 12, 2, 3, 4, 5);

int setpoint = 0;

void setup() {
   // Pin Mode Setup
   pinMode(LED_RED_PIN, OUTPUT);
   pinMode(LED_YELLOW_PIN, OUTPUT);
   pinMode(LED_GREEN_PIN, OUTPUT);
   pinMode(BUZZER_PIN, OUTPUT);

   // LCD Initialization
   lcd.begin(16, 2);
   pinMode(13, OUTPUT);
   digitalWrite(13, HIGH);
}
```

```
void loop() {
  tahap1();
}

void tahap1() {
  display.setBrightness(0);
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print(" - Masih Ada - ");
  lcd.setCursor(0, 1);
  lcd.print(" - Kesempatan - ");
  delay(2000);
  tahap2();
}

void tahap2() {
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print(" - Input PIN - ");

  for (int i = 0; i < 3; i++) {
    blinkLED(LED_RED_PIN, 250);
    blinkLED(LED_YELLOW_PIN, 250);
    blinkLED(LED_GREEN_PIN, 250);
  }
  digitalWrite(LED_YELLOW_PIN, HIGH);

  display.setBrightness(7);
  display.showNumberDec(0, true);

  String pin = "";
  char key = keypad.getKey();
  while (key != 'A') {
    if (key == 'C') {
      pin = "";
      display.showNumberDec(0, true);
    } else if (key >= '0' && key <= '9' && pin.length() < 4) {
      pin += key;
      display.showNumberDec(pin.toInt(), true);
    }
    key = keypad.getKey();
  }

  if (pin.toInt() == PIN_CORRECT) {
```

```
        handleSetpoint();
    } else {
        tahap3();
    }
}

void tahap3() {
    for (int i = 0; i < 4; i++) {
        lcd.setCursor(0, 0);
        lcd.print(" - incorrect!! - ");
        digitalWrite(LED_YELLOW_PIN, LOW);
        digitalWrite(LED_RED_PIN, HIGH);
        digitalWrite(BUZZER_PIN, HIGH);
        display.showNumberDec(0, true);
        delay(500);
        digitalWrite(LED_RED_PIN, LOW);
        digitalWrite(BUZZER_PIN, LOW);
        display.clear();
        delay(500);
    }
    delay(0);
    tahap2();
}

void handleSetpoint() {
    // Blink LED dan bunyi buzzer
    for (int i = 0; i < 2; i++) {
        lcd.setCursor(0, 0);
        lcd.print(" - correct!! - ");
        digitalWrite(LED_YELLOW_PIN, LOW);
        digitalWrite(LED_GREEN_PIN, HIGH);
        digitalWrite(BUZZER_PIN, HIGH);
        display.showNumberDec(0, true);
        delay(500);
        digitalWrite(LED_GREEN_PIN, LOW);
        digitalWrite(BUZZER_PIN, LOW);
        display.clear(); // Membersihkan layar sebelum menampilkan set value
        delay(500);
    }
    tahap4();
}

void tahap4() {
    display.showNumberDec(0, true);
```

```
  lcd.setCursor(0, 0);
  lcd.print(" - Set Value; - ");

  char key;
  while ((key = keypad.getKey()) != 'D') {
    if (key >= '0' && key <= '9') {
      // Mengatur setpoint berdasarkan input dari keypad
      setpoint = setpoint * 10 + (key - '0');
      // Menampilkan setpoint baru pada left segment
      display.showNumberDecEx(setpoint, true, 2, 2); // Menggunakan penanda 2 digit kiri
    } else if (key == 'A') {
      digitalWrite(LED_YELLOW_PIN, HIGH);
      display.setBrightness(7);
      lcd.clear(); // Membersihkan layar sebelum menampilkan angka baru
      lcd.setCursor(0, 0);
      lcd.print(" - Naik Terus - ");
      display.showNumberDecEx(setpoint, true, 2, 2); // Menampilkan setpoint pada left
segment
      int count = 0;
      while (true) {
        display.showNumberDec(count, true, 2, 2); // Menampilkan counting up pada right
segment
        delay(1000);
        count++;
        if (count > setpoint) {
          lcd.clear(); // Membersihkan layar
          lcd.setCursor(0, 0);
          lcd.print(" - Berhenti - ");
          lcd.setCursor(0, 1);
          lcd.print(" - Naiknya - ");
          delay(2000); // Delay 2 detik sebelum kembali ke set values
          lcd.clear();
          digitalWrite(LED_YELLOW_PIN, LOW);
          setpoint = 0; // Set setpoint kembali menjadi 0
          tahap4();
        }
      }
    } else if (key == 'B') {
      digitalWrite(LED_YELLOW_PIN, HIGH);
      display.setBrightness(7);
      lcd.clear(); // Membersihkan layar sebelum menampilkan angka baru
      display.showNumberDecEx(setpoint, true, 2, 2);
      lcd.setCursor(0, 0);
      lcd.print(" - Turun Terus - ");
```

```
            int count = setpoint; // Mengatur nilai awal counting down
            while (count >= 0) {
                display.showNumberDec(count, true, 2, 2); // Menampilkan counting down pada right
segment
                delay(1000);
                count--;
                if (count < 0) {
                    lcd.clear();
                    lcd.setCursor(1, 0);
                    lcd.print(" - Berhenti - ");
                    lcd.setCursor(1, 1);
                    lcd.print(" - Turunnya - ");
                    delay(2000);
                    lcd.clear();
                    digitalWrite(LED_YELLOW_PIN, LOW);
                    setpoint = 0; // Set setpoint kembali menjadi 0
                    tahap4();
                }
            }
        } else if (key == 'C') {
            // Clear setpoint
            setpoint = 0;
            // Menampilkan setpoint baru pada left segment
            display.showNumberDecEx(setpoint, 0b00000011, true); // Menggunakan penanda 2
digit kiri
        }
    }
}

void blinkLED(int pin, int duration) {
    digitalWrite(pin, HIGH);
    delay(duration);
    digitalWrite(pin, LOW);
    delay(duration);
}
```