

LAMPIRAN A

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//Project Tugas Akhir Adi Setiawan
#include <NewPing.h>
#include <Wire.h>
#include <LiquidCrystal_I2C.h>
// Inisialisasi objek LCD
LiquidCrystal_I2C lcd(0x27, 20, 4); // Alamat I2C dan ukuran LCD (20
kolom x 4 baris)
//sensor pertama HC-SR04
#define TRIGGER_PIN_1 23
#define ECHO_PIN_1 22
//sensor kedua HC-SR04
#define TRIGGER_PIN_2 10
#define ECHO_PIN_2 11
int distance1;
int distance2;
int air1;
int air2;
int Reset = 0;
int pos = 0;
int pos2 = 0;
int pos3 = 0;
int pos4 = 0;
//sensor jsn-sr04
#define TRIGGER_PIN_3 44
#define ECHO_PIN_3 45
#define TRIGGER_PIN_4 16
#define ECHO_PIN_4 17
#define TRIGGER_PIN_5 15
#define ECHO_PIN_5 14
#define MAX_DISTANCE 200
int jsn1;
int jsn2;
int jsn3;
//limitswitch
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const int switch1 = 46;
const int switch2 = 47;
const int switch3 = 48;
const int buzz = 49;
int switch1state = 0;
int switch2state = 0;
int switch3state = 0;
int switch1pos = 0;
// relay
const int relayPin1 = 42;
const int relayPin2 = 43;
const unsigned long relay1OnTime = 20000; // 20 detik
const unsigned long relay2OnTime = 10000; // 10 detik
const unsigned long motorStop12Time = 20000; // 20 detik
const unsigned long motorReverse12Time = 20000; // 21 detik
unsigned long startTime = 0;
bool relay1State = false;
bool relay2State = false;
bool relay12off = false;
//Motor
// Pins for motor 1 2 control
const int pwm1a = 3;
const int pwm1b = 2;
const int pwm2a = 8;
const int pwm2b = 9;
// Pins for motor 3 control
const int enablePin3 = 5;
const int in1Pin3 = 36;
const int in2Pin3 = 37;
int motorDC3(5, 36, 37);
// Pins for motor 4 control
const int enablePin4 = 4;
const int in1Pin4 = 34;
const int in2Pin4 = 35;
int motorDC4(4, 34, 35);
// Pins for motor 5 control

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const int enablePin5 = 7;
const int in1Pin5 = 40;
const int in2Pin5 = 41;
int motorDC5(7, 40, 41);
// Pins for motor 6 control
const int enablePin6 = 6;
const int in1Pin6 = 38;
const int in2Pin6 = 39;
int motorDC6(6, 38, 39);
// Objek sensor HC-SR04
NewPing sonar1(TRIGGER_PIN_1, ECHO_PIN_1);
NewPing sonar2(TRIGGER_PIN_2, ECHO_PIN_2);
// sensor jsn
NewPing sonar_1(TRIGGER_PIN_3, ECHO_PIN_3,
MAX_DISTANCE);
NewPing sonar_2(TRIGGER_PIN_4, ECHO_PIN_4,
MAX_DISTANCE);
NewPing sonar_3(TRIGGER_PIN_5, ECHO_PIN_5,
MAX_DISTANCE);
void (*resetFunc)(void) = 0;
void setup() {
  // put your setup code here, to run once:
  Serial.begin(9600);
  Wire.begin();
  lcd.begin();
  lcd.backlight();
  pinMode(switch1, INPUT_PULLUP); //switch
  pinMode(switch2, INPUT_PULLUP);
  pinMode(switch3, INPUT_PULLUP);
  pinMode(buzz, OUTPUT);
  pinMode(relayPin1, OUTPUT); //relay
  pinMode(relayPin2, OUTPUT);
  digitalWrite(relayPin1, LOW); // Matikan relay 1 saat awal
  digitalWrite(relayPin2, LOW); // Matikan relay 2 saat awal
  pinMode(pwm1a, OUTPUT); //motor 12
  pinMode(pwm1b, OUTPUT);

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pinMode(pwm2a, OUTPUT); //motor 12
pinMode(pwm2b, OUTPUT);
pinMode(enablePin3, OUTPUT); //motor 3456
pinMode(in1Pin3, OUTPUT);
pinMode(in2Pin3, OUTPUT);
pinMode(enablePin4, OUTPUT);
pinMode(in1Pin4, OUTPUT);
pinMode(in2Pin4, OUTPUT);
pinMode(enablePin5, OUTPUT);
pinMode(in1Pin5, OUTPUT);
pinMode(in2Pin5, OUTPUT);
pinMode(enablePin6, OUTPUT);
pinMode(in1Pin6, OUTPUT);
pinMode(in2Pin6, OUTPUT);
digitalWrite(buzz, LOW);
}
void loop() {
  Switch();
  if (switch1state == 1 && Reset == 1) {
    resetFunc();
  }
  if (pos == 0) {
    ultrasonic(); Serial.println("a");
  }
  if (switch1state == 0) {
    Reset = 1;
    pos = 1; Serial.println("b");
    if (switch1state == 1 && Reset == 1) {
      resetFunc();
    }
    if (pos4 == 0 && air1 >= 5 && air2 >= 5) {
      Reset = 1;
      Switch();
      jsn(); Serial.println("c");
      if (jsn2 >= 25) {
        lcd.clear();
      }
    }
  }
}

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lcd.setCursor(0, 1);
lcd.print(" Netpot Belum ");
lcd.setCursor(0, 2);
lcd.print(" Dimasukkan"); Serial.println("c");
delay(200);
}
if (pos3 == 0 && jsn2 <= 25) {
Reset = 1;
forward12(); Serial.println("d");
Switch();
if (pos2 == 1 || switch2state == 0) {
pos2 = 1;
stop12(); Serial.println("e");
motorForward(200);
digitalWrite(relayPin1, HIGH);
digitalWrite(relayPin2, HIGH);
delay(10000); //10detik relay ke2
digitalWrite(relayPin2, LOW); Serial.println("f");
motorReverse(200);
delay(10000); //10detik relay ke1
digitalWrite(relayPin1, LOW);
motorStop();
reverse12();
Switch();
pos2 = 0;
pos3 = 1;
}
}
Switch();
if (pos2 == 0 && switch3state == 0) {
stop12(); Serial.println("g");
lcd.clear();
lcd.setCursor(0, 1);
lcd.print(" Proses Selesai");
lcd.setCursor(0, 2);
lcd.print("Silahkan Buka Pintu!");

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    digitalWrite(buzz, HIGH);
    delay(300);
    pos4 = 1;
}
if (switch1state == 1 && Reset == 1) {
    resetFunc();
}
}
if (air1 < 5 && air2 < 5) {
    lcd.clear();
    lcd.setCursor(0, 1);
    lcd.print(" Tinggi Air Kurang");
    lcd.setCursor(0, 2);
    lcd.print(" Masukan Air & Sabun");
    delay(200);
}
}
// put your main code here, to run repeatedly:
}
// forward motor 795
void forward12() {
    Serial.println("motor 12 forward");
    lcd.clear();
    lcd.setCursor(3, 3);
    lcd.print("motor 12 forward");
    analogWrite(pwm1a, 0); // motor 1
    analogWrite(pwm1b, 170);
    analogWrite(pwm2a, 140); // motor 2
    analogWrite(pwm2b, 0);
}
// forward motor dc 395
void motorForward( int speed) {
    Serial.println("motor 3456 forward");
    lcd.clear();
    lcd.setCursor(1, 3);
    lcd.print("motor 3456 forward");
}

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digitalWrite(in1Pin3, HIGH);
digitalWrite(in2Pin3, LOW);
analogWrite(enablePin3, speed);
digitalWrite(in1Pin4, HIGH);
digitalWrite(in2Pin4, LOW);
analogWrite(enablePin4, speed);
digitalWrite(in1Pin5, HIGH);
digitalWrite(in2Pin5, LOW);
analogWrite(enablePin5, speed);
digitalWrite(in1Pin6, HIGH);
digitalWrite(in2Pin6, LOW);
analogWrite(enablePin6, speed);
}
// sensor ultrasonik jsn-sr04t
void jsn() {
  jsn1 = sonar_1.ping_cm();
  jsn2 = sonar_2.ping_cm();
  jsn3 = sonar_3.ping_cm();
  lcd.clear();
  lcd.setCursor(0, 1); lcd.print("Jarak netpot1 = ");
  lcd.setCursor(17, 1); lcd.print(jsn1);
  lcd.setCursor(0, 2); lcd.print("Jarak netpot2 = ");
  lcd.setCursor(17, 2); lcd.print(jsn2);
  lcd.setCursor(0, 3); lcd.print("Jarak netpot3 = ");
  lcd.setCursor(17, 3); lcd.print(jsn3);
  delay(200);
}
//reverse motor dc 795
void reverse12() {
  Serial.println("motor 12 reverse");
  lcd.clear();
  lcd.setCursor(3, 3);
  lcd.print("motor 12 reverse");
  analogWrite(pwm1a, 170); // motor 1
  analogWrite(pwm1b, 0);
  analogWrite(pwm2a, 0); // motor 2
}

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    analogWrite(pwm2b, 140);
}
//reverse motor dc 395
void motorReverse(int speed) {
    Serial.println("motor 3456 reverse");
    lcd.clear();
    lcd.setCursor(1, 3);
    lcd.print("motor 3456 reverse");
    digitalWrite(in1Pin3, LOW);
    digitalWrite(in2Pin3, HIGH);
    analogWrite(enablePin3, speed);
    digitalWrite(in1Pin4, LOW);
    digitalWrite(in2Pin4, HIGH);
    analogWrite(enablePin4, speed);
    digitalWrite(in1Pin5, LOW);
    digitalWrite(in2Pin5, HIGH);
    analogWrite(enablePin5, speed);
    digitalWrite(in1Pin6, LOW);
    digitalWrite(in2Pin6, HIGH);
    analogWrite(enablePin6, speed);
}
// stop motor dc 795
void stop12() {
    Serial.println("motor 12 rstop");
    lcd.clear();
    lcd.setCursor(3, 3);
    lcd.print("motor 12 stop");
    analogWrite(pwm1a, 0); // motor 1
    analogWrite(pwm1b, 0);
    analogWrite(pwm2a, 0); // motor 2
    analogWrite(pwm2b, 0);
}
// stop motor dc 395
void motorStop() {
    lcd.clear();
    lcd.setCursor(3, 3);

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lcd.print("motor 3456 stop");
digitalWrite(in1Pin3, LOW);
digitalWrite(in2Pin3, LOW);
digitalWrite(in1Pin4, LOW);
digitalWrite(in2Pin4, LOW);
digitalWrite(in1Pin5, LOW);
digitalWrite(in2Pin5, LOW);
digitalWrite(in1Pin6, LOW);
digitalWrite(in2Pin6, LOW);
analogWrite(enablePin3, 0);
analogWrite(enablePin4, 0);
analogWrite(enablePin5, 0);
analogWrite(enablePin6, 0);
}
// limite switch
void Switch() {
    switch1state = digitalRead(switch1);
    switch2state = digitalRead(switch2);
    switch3state = digitalRead(switch3);
    delay(100);
}
// sensor ultrasonik hc-sr04
void ultrasonic() {
    distance1 = sonar1.ping_cm();
    distance2 = sonar2.ping_cm();
    air1 = 30 - distance1;
    air2 = 30 - distance2;
    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("  Masukan netpot  ");
    lcd.setCursor(0, 1);
    lcd.print("  Tutup Pintu!  ");
    lcd.setCursor(0, 2);
    lcd.print("  Tinggi sabun = ");
    lcd.setCursor(17, 2);
    lcd.print(air1);
}

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lcd.setCursor(0, 3);  
lcd.print(" Tinggi air = ");  
lcd.setCursor(17, 3);  
lcd.print(air2);  
delay(400);  
}
```

LAMPIRAN B



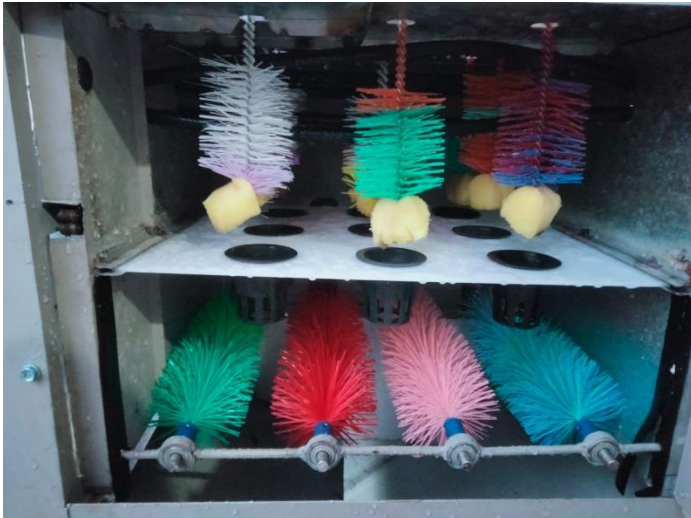
Lampiran 1. Alat Tampak Depan



Lampiran 2. Alat Tampak Samping



Lampiran 3. Ruang pencuci Tanpa Netpot



Lampiran 4. Ruang pencuci Terdapat Netpot



Lampiran 5. Proses Pencucian



Lampiran 6. Sistem Mekanik Ruang Pencucian



Lampiran 7. Wiring Komponen Alat Pencuci Netpot