LAMPIRAN

Lampiran 1. *Sketch Program*

```
/*
RANCANG BANGUN PROTOTIPE SISTEM PERINGATAN JARAK AMAN
KENDARAAN RODA EMPAT
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*/
#include <LiquiDCrystal_I2C.h>
#define echoPin 8             // Ultrasonic echo pin pada
digital pin 8
#define initPin 9            // Ultrasonic triger pin pada
digital pin 9
unsigned long jarak = 0;    // variabel untuk membaca pulsa
float Val;
float rev=0;
const int pinBuzz = 7;      // Buzzer pada digital pin 7
int LED = 10;               // LED pin pada digital pin 10
int enB = 11;                  // DriverMotor ENB pin pada
digital pin 11
int in4 = 12;                  // DriverMotor IN4 pin pada
digital pin 12
int in3 = 13;                  // DriverMotor IN3 pin pada
digital pin 13
int oldtime=0;
int waktu, CepatMotor, duration;
long kecepatan;

// Setting alamat LCD ke 0x27
LiquiDCrystal_I2C lcd(0x27,16,2);
void Interrupt() {
  rev++;
}
void setup() {
  attachInterrupt(1,Interrupt, RISING);

// inisialisasi digital pin 7 untuk Buzzer
  pinMode(7, OUTPUT);

// inisialisasi digital pin 10 untuk LED
  pinMode(10, OUTPUT);

// inisialisasi driver motor sebagai output
  pinMode(13, OUTPUT);
  pinMode(12, OUTPUT);
  pinMode(11, OUTPUT);
```

```
// setting output pada pin initPin
  pinMode(initPin, OUTPUT);

// setting input untuk pin Echo
  pinMode(echoPin, INPUT);

// inisialisasi LCD dan menyalakan backlight
  lcd.begin();
  lcd.backlight();
  Serial.begin(9600);
}

void loop() {
// pembacaan RPM
  delay(90);
  detachInterrupt(0);
  waktu=millis()-oldtime;
  kecepatan=((rev/waktu)*60000/2.88);    // *60000 Asumsi
kecepatan maksimal 100 kmh /2.88
  oldtime=millis();
  rev=0;

// pembacaan Jarak
  digitalWrite(initPin, HIGH);
  delayMicroseconds(5);
  digitalWrite(initPin, LOW);
  duration = pulseIn(echoPin, HIGH);
  jarak = (duration/56.5/2);      // 2 meter = 100 meter
/56.5/2

// Logika
if ((kecepatan>=0 & kecepatan<=10) & (jarak<=10)) {
  digitalWrite(enB, 0);               // motor DC berhenti
  digitalWrite(LED, HIGH);            // lampu LED menyala
  digitalWrite(pinBuzz, HIGH);         // buzzer menyala
  //Print a message to the LCD
    lcd.setCursor(10,0);
    lcd.print("SEGERA");
    lcd.setCursor(10,1);
    lcd.print("REM!!!");
    delay(50);
}
else if ((kecepatan>=10 & kecepatan<=30) & (jarak<10)) {
  digitalWrite(enB, 0);
  digitalWrite(LED, HIGH);
  digitalWrite(pinBuzz, HIGH);
  //Print a message to the LCD
    lcd.setCursor(10,0);
    lcd.print("SEGERA");
    lcd.setCursor(10,1);
```

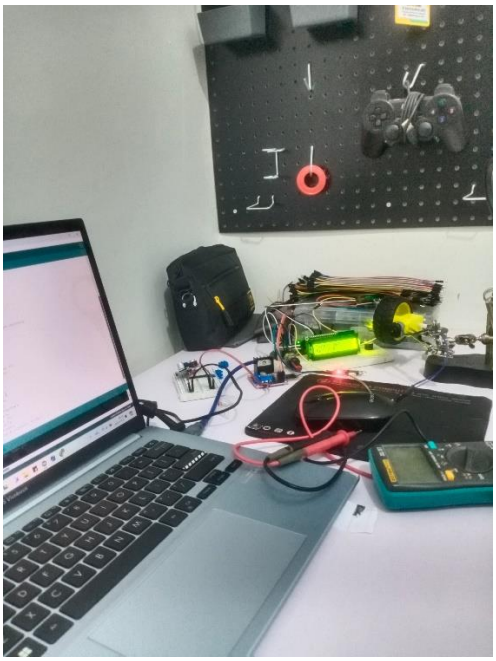
```
    lcd.print("REM!!!");
    delay(100);
}
else if ((kecepatan>=10 & kecepatan<=30) & (jarak<15)) {
  digitalWrite(enB, 150);
  digitalWrite(LED, HIGH);
  //Print a message to the LCD
    lcd.setCursor(10,0);
    lcd.print("HATI-");
    lcd.setCursor(10,1);
    lcd.print("HATI");
    delay(100);
}
else if ((kecepatan>=30 & kecepatan<=40) & (jarak<15)) {
  digitalWrite(enB, 0);
  digitalWrite(LED, HIGH);
  digitalWrite(pinBuzz, HIGH);
  //Print a message to the LCD
    lcd.setCursor(10,0);
    lcd.print("SEGERA");
    lcd.setCursor(10,1);
    lcd.print("REM!!!");
    delay(100);
}
else if ((kecepatan>=30 & kecepatan<=40) & (jarak<20)) {
  digitalWrite(enB, 150);
  digitalWrite(LED, HIGH);
  digitalWrite(pinBuzz, HIGH);
  //Print a message to the LCD
    lcd.setCursor(10,0);
    lcd.print("HATI-");
    lcd.setCursor(10,1);
    lcd.print("HATI");
    delay(100);
}
else if ((kecepatan>=40 & kecepatan<=50) & (jarak<20)) {
  digitalWrite(enB, 0);
  digitalWrite(LED, HIGH);
  digitalWrite(pinBuzz, HIGH);
  //Print a message to the LCD
    lcd.setCursor(10,0);
    lcd.print("SEGERA");
    lcd.setCursor(10,1);
    lcd.print("REM!!!");
    delay(100);
}
else if ((kecepatan>=40 & kecepatan<=50) & (jarak<25)) {
  digitalWrite(enB, 150);
  digitalWrite(LED, HIGH);
  digitalWrite(pinBuzz, HIGH);
  //Print a message to the LCD
```

```
    lcd.setCursor(10,0);
    lcd.print("HATI-");
    lcd.setCursor(10,1);
    lcd.print("HATI");
    delay(100);
}
else if ((kecepatan>=50 & kecepatan<=60) & (jarak<25)) {
  digitalWrite(enB, 0);
  digitalWrite(LED, HIGH);
  digitalWrite(pinBuzz, HIGH);
  //Print a message to the LCD
    lcd.setCursor(10,0);
    lcd.print("SEGERA");
    lcd.setCursor(10,1);
    lcd.print("REM!!!");
    delay(100);
}
else if ((kecepatan>=50 & kecepatan<=60) & (jarak<40)) {
  digitalWrite(enB, 150);
  digitalWrite(LED, HIGH);
  digitalWrite(pinBuzz, HIGH);
  //Print a message to the LCD
    lcd.setCursor(10,0);
    lcd.print("HATI-");
    lcd.setCursor(10,1);
    lcd.print("HATI");
    delay(100);
}
else if ((kecepatan>=60 & kecepatan<=70) & (jarak<40)) {
  digitalWrite(enB, 0);
  digitalWrite(LED, HIGH);
  digitalWrite(pinBuzz, HIGH);
  //Print a message to the LCD
    lcd.setCursor(10,0);
    lcd.print("SEGERA");
    lcd.setCursor(10,1);
    lcd.print("REM!!!");
    delay(100);
}
else if ((kecepatan>=60 & kecepatan<=70) & (jarak<50)) {
  digitalWrite(enB, 150);
  digitalWrite(LED, HIGH);
  digitalWrite(pinBuzz, HIGH);
  //Print a message to the LCD
    lcd.setCursor(10,0);
    lcd.print("HATI-");
    lcd.setCursor(10,1);
    lcd.print("HATI");
    delay(100);
}
else if ((kecepatan>=70 & kecepatan<=80) & (jarak<50)) {
```

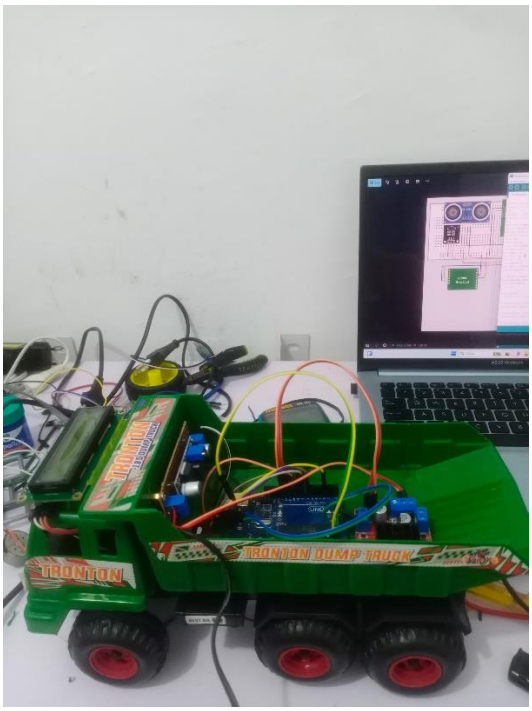
```
  digitalWrite(enB, 0);
  digitalWrite(LED, HIGH);
  digitalWrite(pinBuzz, HIGH);
  //Print a message to the LCD
    lcd.setCursor(10,0);
    lcd.print("SEGERA");
    lcd.setCursor(10,1);
    lcd.print("REM!!!");
    delay(100);
}
else if ((kecepatan>=70 & kecepatan<=80) & (jarak<60)) {
  digitalWrite(enB, 150);
  digitalWrite(LED, HIGH);
  digitalWrite(pinBuzz, HIGH);
  //Print a message to the LCD
    lcd.setCursor(10,0);
    lcd.print("HATI-");
    lcd.setCursor(10,1);
    lcd.print("HATI");
    delay(100);
}
else if ((kecepatan>=80 & kecepatan<=90) & (jarak<60)) {
  digitalWrite(enB, 0);
  digitalWrite(LED, HIGH);
  digitalWrite(pinBuzz, HIGH);
  //Print a message to the LCD
    lcd.setCursor(10,0);
    lcd.print("SEGERA");
    lcd.setCursor(10,1);
    lcd.print("REM!!!");
    delay(100);
}
else if ((kecepatan>=80 & kecepatan<=90) & (jarak<70)) {
  digitalWrite(enB, 150);
  digitalWrite(LED, HIGH);
  digitalWrite(pinBuzz, HIGH);
  //Print a message to the LCD
    lcd.setCursor(10,0);
    lcd.print("HATI-");
    lcd.setCursor(10,1);
    lcd.print("HATI");
    delay(100);
}
else if ((kecepatan>=90) & (jarak<70)) {
  digitalWrite(enB, 0);
  digitalWrite(LED, HIGH);
  digitalWrite(pinBuzz, HIGH);
  //Print a message to the LCD
    lcd.setCursor(10,0);
    lcd.print("SEGERA");
    lcd.setCursor(10,1);
```

```
    lcd.print("REM!!!");
    delay(100);
}
else if ((kecepatan>=90) & (jarak<80)) {
  digitalWrite(enB, 150);
  digitalWrite(LED, HIGH);
  digitalWrite(pinBuzz, HIGH);
  //Print a message to the LCD
    lcd.setCursor(10,0);
    lcd.print("HATI-");
    lcd.setCursor(10,1);
    lcd.print("HATI");
    delay(100);
}
else {
  // Kontrol Motor DC
  analogWrite(enB, 200);        //max 200=9,24v 150=8,01v
  digitalWrite(in3, HIGH);
  digitalWrite(in4, LOW);
  digitalWrite(LED, LOW);
  digitalWrite(pinBuzz, LOW);          // buzzer mati
  //Print a message to the LCD
    lcd.setCursor(10,0);
    lcd.print("JARAK");
    lcd.setCursor(11,1);
    lcd.print("AMAN");
    delay(500);
}
// konfigurasi penempatan posisi karakter pada LCD
  lcd.clear();
  lcd.setCursor(0,0);
  lcd.print("Cepat:");
  lcd.setCursor(7,0);
  lcd.print(int(kecepatan));
  lcd.setCursor(0,1);
  lcd.print("Jarak:");
  lcd.setCursor(7,1);
  lcd.print(int(jarak));
  delay(500);
}
//M. BABUR RAHMAN AMIN 217180003
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Lampiran 2. Dokumentasi Perakitan Mobil Prototipe







Lampiran 3. Dokumentasi Pengujian Mobil Prototipe





