

LAMPIRAN A

PROGRAM ARDUINO

```
// Pin definitions
const int sensorpiezo = 0;
const int programSwitch = 2;
const int LEDmerah = 4;
const int LEDhijau = 5;
const int motor1 = 6;
const int motor2 = 7;
// Tuning constants.
const int batasminimum = 4;
const int toleransi1 = 35;
const int ratatoleransi = 25;
const int jedaketukan = 150;
const int waktuputaranmotor = 1000;
const int maxketukan = 20;
const int ketukanselesai = 1200;
// Variables.
int koderahasia[maxketukan] = {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0};
int bacaketukan[maxketukan];
int nilaisensorpiezo = 0;
boolean programButtonPressed = false;

void setup() {
  pinMode(motor1, OUTPUT);
  pinMode(motor2, OUTPUT);
  pinMode(LEDmerah, OUTPUT);
  pinMode(LEDhijau, OUTPUT);
  pinMode(programSwitch, INPUT);
  digitalWrite(programSwitch, HIGH);

  Serial.begin(9600);
  Serial.println("Program start.");
  digitalWrite(LEDhijau, HIGH);
}

void loop() {
  nilaisensorpiezo = analogRead(sensorpiezo);
```

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if (digitalRead(programSwitch)==LOW){
    programButtonPressed = true;
    digitalWrite(LEDmerah, HIGH);
} else {
    programButtonPressed = false;
    digitalWrite(LEDmerah, LOW);
}
if (nilaisensorpiezo >=batasminimum){
    mendengarketukan();
}
}

void mendengarketukan(){
    Serial.println("knock starting");
    int i = 0;
    for (i=0;i<maxketukan;i++){
        bacaketukan[i]=0;
    }
    int ketukanawal=0;
    int startTime=millis();
    int now=millis();

    digitalWrite(LEDhijau, LOW);
    if (programButtonPressed==true){
        digitalWrite(LEDmerah, LOW);
    }
    delay(jedaketukan);
    digitalWrite(LEDhijau, HIGH);
    if (programButtonPressed==true){
        digitalWrite(LEDmerah, HIGH);
    }
    do {
        nilaisensorpiezo = analogRead(sensorpiezo);
        if (nilaisensorpiezo >=batasminimum){

            Serial.println("knock.");
            now=millis();
            bacaketukan[ketukanawal] = now-startTime;
            ketukanawal ++;
            startTime=now;
            digitalWrite(LEDhijau, LOW);
            if (programButtonPressed==true){
                digitalWrite(LEDmerah, LOW);
            }
        }
    }
}

```

```

    delay(jedaketukan);
    digitalWrite(LEDhijau, HIGH);
    if (programButtonPressed==true){
        digitalWrite(LEDmerah, HIGH);
    }
}

now=millis();
} while ((now-startTime < ketukanselesai) && (ketukanawal < maxketukan));

if (programButtonPressed==false){
    if (cocokanketukan() == true){
        bukapintu();
    } else {
        Serial.println("Secret knock failed.");
        digitalWrite(LEDhijau, LOW);
        for (i=0;i<4;i++){
            digitalWrite(LEDmerah, HIGH);
            delay(100);
            digitalWrite(LEDmerah, LOW);
            delay(100);
        }
        digitalWrite(LEDhijau, HIGH);
    }
} else {
    cocokanketukan();

    Serial.println("New lock stored.");
    digitalWrite(LEDmerah, LOW);
    digitalWrite(LEDhijau, HIGH);
    for (i=0;i<3;i++){
        delay(100);
        digitalWrite(LEDmerah, HIGH);
        digitalWrite(LEDhijau, LOW);
        delay(100);
        digitalWrite(LEDmerah, LOW);
        digitalWrite(LEDhijau, HIGH);
    }
}
}

void bukapintu(){
    Serial.println("Door unlocked!");
    int i=0;

```

```

digitalWrite(motor1, HIGH);
digitalWrite(motor2, LOW);
digitalWrite(LEDhijau, HIGH);

delay (waktuputaranmotor);

digitalWrite(motor1, LOW);
digitalWrite(motor2, LOW);

delay(5000);

digitalWrite(motor1, LOW);
digitalWrite(motor2, HIGH);

delay(waktuputaranmotor);

digitalWrite(motor1, LOW);
digitalWrite(motor2, LOW);

for (i=0; i < 5; i++){
    digitalWrite(LEDhijau, LOW);
    delay(100);
    digitalWrite(LEDhijau, HIGH);
    delay(100);
}
}

boolean cocokanketukan(){
    int i=0;
    int hitketukanterjadi = 0;
    int hitungkoderahasia = 0;
    int maxjedaketukan = 0;

    for (i=0;i<maxketukan;i++){
        if (bacaketukan[i] > 0){
            hitketukanterjadi++;
        }
        if (koderahasia[i] > 0){
            hitungkoderahasia++;
        }
        if (bacaketukan[i] > maxjedaketukan){
            maxjedaketukan = bacaketukan[i];
        }
    }
}

```

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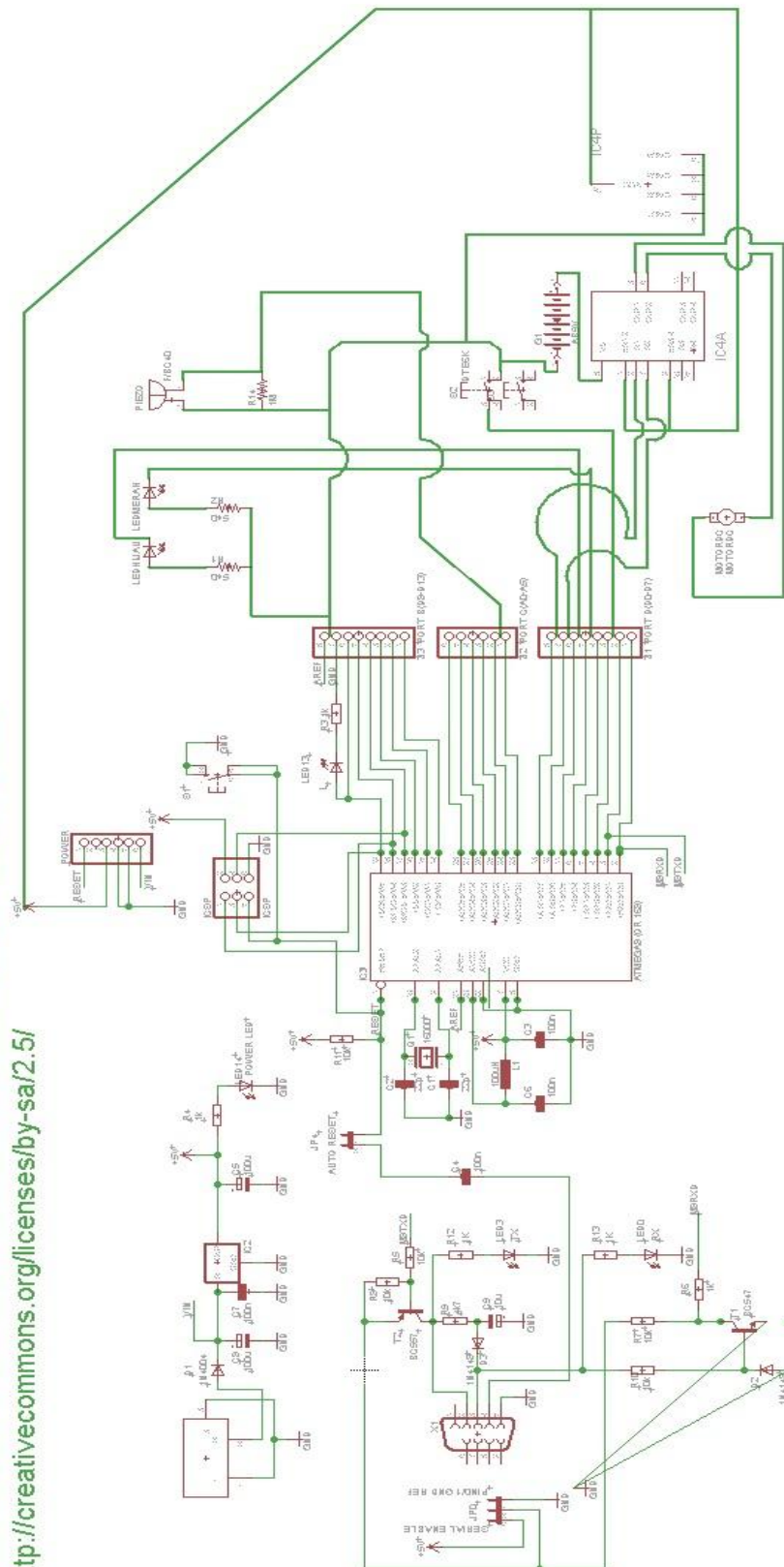
if (programButtonPressed==true){
    for (i=0;i<maxketukan;i++){
        koderahasia[i]= map(bacaketukan[i],0, maxjedaketukan, 0, 100);
    }

    digitalWrite(LEDhijau, LOW);
    digitalWrite(LEDmerah, LOW);
    delay(1000);
    digitalWrite(LEDhijau, HIGH);
    digitalWrite(LEDmerah, HIGH);
    delay(50);
    for (i = 0; i < maxketukan ; i++){
        digitalWrite(LEDhijau, LOW);
        digitalWrite(LEDmerah, LOW);

        if (koderahasia[i] > 0){
            delay( map(koderahasia[i],0, 100, 0, maxjedaketukan));
            digitalWrite(LEDhijau, HIGH);
            digitalWrite(LEDmerah, HIGH);
        }
        delay(50);
    }
    return false;
}
if (hitketukanterjadi != hitungkoderahasia){
    return false;
}
int totalbedawaktu=0;
int bedawaktu=0;
for (i=0;i<maxketukan;i++){
    bacaketukan[i]= map(bacaketukan[i],0, maxjedaketukan, 0, 100);
    bedawaktu = abs(bacaketukan[i]-koderahasia[i]);
    if (bedawaktu > toleransi1){
        return false;
    }
    totalbedawaktu += bedawaktu;
}
if (totalbedawaktu/hitungkoderahasia>ratatoleransi){
    return false;
}
return true;
}

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LAMPIRAN B
SKEMATIK RANGKAIAN



LAMPIRAN C

FLOWCHART

