LAMPIRAN A
PROGRAM ARDUINO ALAT

```
#include <PZEM004Tv30.h>
#include <Wire.h>
#include <Adafruit_INA219.h>
#include <LiquidCrystal_I2C.h>
#include <EEPROM.h>

#define relay_cutDC 5
#define relay_cutAC 6

LiquidCrystal_I2C lcd(0x27, 20, 4);
Adafruit_INA219 ina219(0x40);
PZEM004Tv30 pzem(Serial1);

float balance = 0;
float consumption = 0;

void setup() {
  Serial.begin(9600);
  Serial2.begin(9600);

  ina219.begin();

  lcd.init();
```

```
  lcd.backlight();

  pinMode(relay_cutDC, OUTPUT);
  pinMode(relay_cutAC, OUTPUT);

  EEPROM.get(0, balance);
  EEPROM.get(10, consumption);
}
void loop() {
  float teganganAC = pzem.voltage();
  float dayaAc = pzem.power();
  float teganganDC = ina219.getBusVoltage_V();
  float dayaDC = ina219.getPower_mW() / 1000;

  if (isnan(teganganAC)) {
   teganganAC = 0;
  } else {
   if (consumption < balance) {
    consumption = consumption + (dayaAc / 3600.0);
   }
  }
  if (dayaAc < 0) {
   dayaAc = 0;
  } else {
   if (consumption < balance) {
    consumption = consumption + (dayaDC / 3600.0);
```

```
  }
}

EEPROM.put(10, consumption);

lcd.setCursor(0, 0);
lcd.print("Saldo   :    ");
lcd.setCursor(0, 0);
lcd.print("Saldo   :");
lcd.print(balance);

lcd.setCursor(0, 1);
lcd.print("Penggunaan:    ");
lcd.setCursor(0, 1);
lcd.print("Penggunaan:");
lcd.print(consumption);

lcd.setCursor(0, 2);
lcd.print("VDC:     ");
lcd.setCursor(0, 2);
lcd.print("VDC:");
lcd.print(teganganDC);

lcd.setCursor(0, 3);
lcd.print("PDC:     ");
lcd.setCursor(0, 3);
```

```
lcd.print("PDC:");
lcd.print(dayaDC);


lcd.setCursor(10, 2);
lcd.print("VAC:      ");
lcd.setCursor(10, 2);
lcd.print("VAC:");
lcd.print(teganganAC);


lcd.setCursor(10, 3);
lcd.print("PAC:      ");
lcd.setCursor(10, 3);
lcd.print("PAC:");
lcd.print(dayaAc);


String data = "";
data += teganganAC;
data += ";";
data += dayaAc;
data += ";";
data += teganganDC;
data += ";";
data += dayaDC;
data += ";";
data += balance;
data += ";";
```

```
   data += consumption;
   data += ";";
   Serial.println(data);
   Serial2.println(data);

   if (consumption < balance) {
    digitalWrite(relay_cutDC, LOW);
    digitalWrite(relay_cutAC, LOW);
   } else {
    digitalWrite(relay_cutDC, HIGH);
    digitalWrite(relay_cutAC, HIGH);
   }
   delay(1000);
}
void serialEvent2() {
  String data = Serial2.readStringUntil('\n');
  if (data.indexOf("reset") != -1) {
    balance = 0;
    consumption = 0;
    EEPROM.put(0, 0);
    EEPROM.put(10, 0);
   } else {
    balance = balance + data.toInt();
    EEPROM.put(0, balance);
   }
}
```
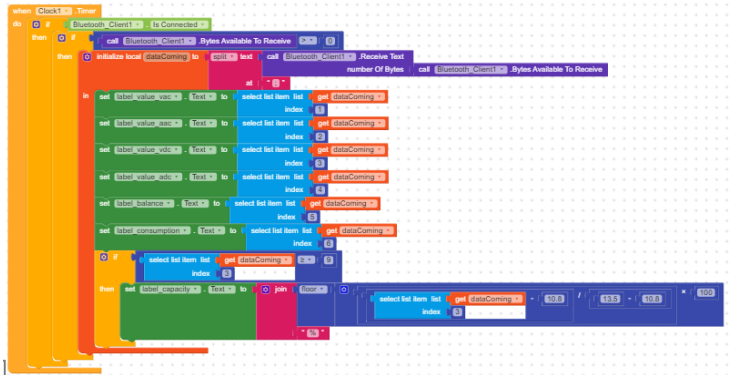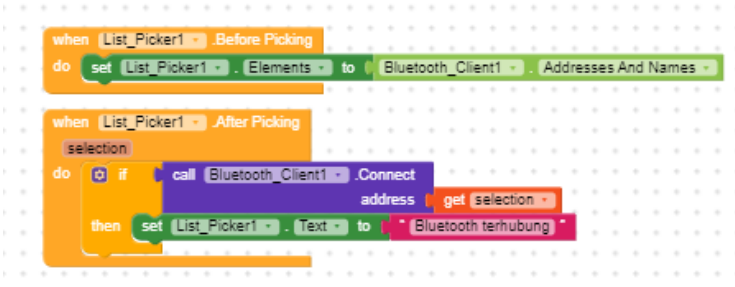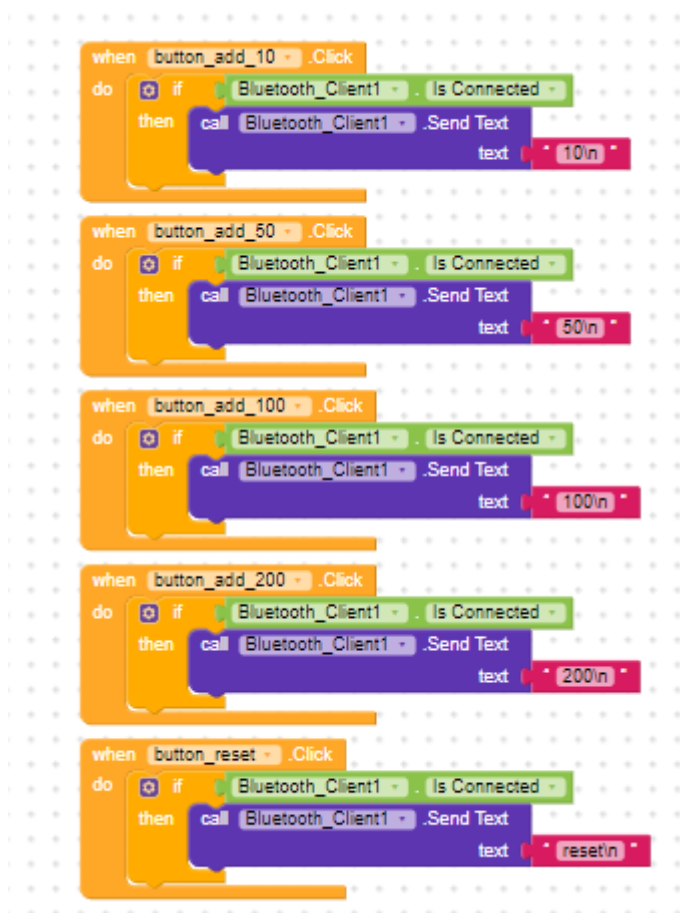
1. Pemograman blok *puzzle* kodular untuk button paket

2. program berupa blok *puzzle* kodular untuk konektifitas *Bluetooth.*

3. program berupa blok *puzzle* kodular untuk *Button*
   paket dan *button* reset

BIODATA PENULIS

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Riwayat Pendidikan

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Penulis telah mengikuti seminar proposal pada tanggal 09 agustus 2022 sebagai salah satu persyaratan untuk memperoleh gelar Ahli Madya (A.Md)