

Main Program

```
/*
   Program Sistem Keamanan RFID
*/

#include<SPI.h>
#include<SD.h>
#include<MFRC522.h>
#include<LiquidCrystal.h>
#include<Wire.h>
#include<RtcDS3231.h>
#include<EEPROM.h>

// Definisi - Definisi Makro -----
-----
#define debug          Serial
#define bth            Serial1

// Pin LED dan Relay
#define ledMerah1      48
#define ledHijau1      46
#define ledMerah2      28
#define ledHijau2      29
#define relay1         A7
#define relay2         16
#define relay1On       digitalWrite(relay1,LOW)
#define relay1Off      digitalWrite(relay1,HIGH)
#define relay2On       digitalWrite(relay2,LOW)
#define relay2Off      digitalWrite(relay2,HIGH)

// Pin RFID
#define RST1_PIN       49
#define SS1_PIN        47
#define RST2_PIN       33
#define SS2_PIN        31

// Pin SD Card
#define CS_PIN         53

#define printXY1(x,y,z) {lcd1.setCursor(x,y); lcd1.print(z);}
#define printXY2(x,y,z) {lcd2.setCursor(x,y); lcd2.print(z);}

// Deklarasi Object -----
-----
LiquidCrystal lcd1(40, 41, 42, 43, 44, 45); // lcd1 : RS EN D4 D5
D6 D7
LiquidCrystal lcd2(22, 23, 24, 25, 26, 27);
MFRC522 rfid1(SS1_PIN, RST1_PIN);
MFRC522 rfid2(SS2_PIN, RST2_PIN);
RtcDS3231<TwoWire> rtc(Wire);
RtcDateTime now;

// Deklarasi Variabel -----
-----
byte ID1[4], ID2[4];
byte ID1_1[4], ID1_2[4], ID1_3[4], ID1_4[4], ID1_5[4]; // 4 slot
kunci pintu 1
```

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byte ID2_1[4], ID2_2[4], ID2_3[4], ID2_4[4], ID2_5[4]; // 4 slot
kunci pintu 2
bool stat1 =false, stat2 =false;
bool statSDCard =false;
bool statRTC =false;
bool modeSetting =false;

bool dataBaru =false;
String perintah ="";
String data ="";
String bufTerima ="";
bool rxFlag =false;
bool bukaManual1 =false;
bool bukaManual2 =false;
bool tutupManual1 =false;
bool tutupManual2 =false;
int sisaHari1 = 0;
int sisaHari2 = 0;

// "0123456789ABCDEF"
char nama1[17] = " Agus Yunanto ";
char nama2[17] = " Budi Gunawan ";
byte simpanKartu1[5] = {0, 0, 0, 0, 0}; // penanda slot isi atau
tidak
byte simpanKartu2[5] = {0, 0, 0, 0, 0};
int noKartu1 = 0;
int noKartu2 = 0;
String namaFile ="";
RtcDateTime tglSelesai1;
RtcDateTime tglSelesai2;

constint almtNama1 = 20;
constint almtNama2 = almtNama1 +sizeof(nama1);
constint almtID1_1 = almtNama2 +sizeof(nama2);
constint almtID1_2 = almtID1_1 +sizeof(ID1_1);
constint almtID1_3 = almtID1_2 +sizeof(ID1_2);
constint almtID1_4 = almtID1_3 +sizeof(ID1_3);
constint almtID2_1 = almtID1_4 +sizeof(ID1_4);
constint almtID2_2 = almtID2_1 +sizeof(ID2_1);
constint almtID2_3 = almtID2_2 +sizeof(ID2_2);
constint almtID2_4 = almtID2_3 +sizeof(ID2_3);
constint almtTglSls1 = almtID2_4 +sizeof(ID2_4);
constint almtTglSls2 = almtTglSls1 +sizeof(tglSelesai1);

constint almtID1_5 = almtTglSls2 +sizeof(tglSelesai2);
constint almtID2_5 = almtID1_5 +sizeof(ID1_5);

/*****
*****/
/* Inisialisasi
*/
/*****
*****/
voidsetup() {
  pinMode(ledMerah1,OUTPUT); // set pin Led Merah 1 sebagai OUTPUT
  pinMode(ledHijau1,OUTPUT);
  pinMode(ledMerah2,OUTPUT);
  pinMode(ledHijau2,OUTPUT);
  pinMode(relay1,OUTPUT);

```

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pinMode(relay2, OUTPUT);
relay1Off;
relay2Off;

Serial.begin(115200); // Inisialisasi Serial
bth.begin(38400);     // Inisialisasi Bluetooth
lcd1.begin(16, 2);    // Inisialisasi LCD 1
lcd2.begin(16, 2);    // Inisialisasi LCD 2

SPI.begin();
rfid1.PCD_Init();     // Inisialisasi RFID
rfid1.PCD_DumpVersionToSerial();
rfid2.PCD_Init();     // Inisialisasi RFID
rfid2.PCD_DumpVersionToSerial();
initSDCard();         // Inisialisasi SDCard
initRTC();            // Inisialisasi RTC

if (EEPROM.read(0x00) != 0x37) {
    kosongkanEEPROM();
}
else {
    bacaEEPROM();

    for (int i = 0x01; i < 0x09; i++) {
        Serial.print(EEPROM.read(i), BIN);
    }
    Serial.println();
    debug.println("-----v");
    printUID(ID1_1);
    printUID(ID1_2);
    printUID(ID1_3);
    printUID(ID1_4);
    printUID(ID1_5);
    debug.println("----");
    printUID(ID2_1);
    printUID(ID2_2);
    printUID(ID2_3);
    printUID(ID2_5);
    debug.println("-----^");
}

bacaRTC();
hitungHari();
Serial.print("Sisa hari 1: "); Serial.println(sisaHari1);
Serial.print("Sisa hari 2: "); Serial.println(sisaHari2);

// Selamat Datang
delay(500);
}

/*****
*****/
/*
                                     Program Utama
*/
/*****
*****/
voidloop() {
    terimaDataBluetooth();
}

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    bacaRTC();
    hitungHari();

    // jika ada data baru dari bluetooth diterima-----
    -----v
    if (dataBaru ==true) {
        dataBaru =false;
        perintah ="";
        data ="";
        perintah = bufTerima.substring(0, bufTerima.indexOf('|'));
        // pisahkan perintah
        data = bufTerima.substring(bufTerima.indexOf('|') + 1);
        // pisahkan isi data

        Serial.println(bufTerima);
        Serial.println(perintah);
        Serial.println(data);

        // Perintah buka dan tutup manual pintu 1 -----
        if (perintah == "BUKA1") {
            stat1 =true;
            relay1On;
            digitalWrite(ledMerah1,LOW);
            digitalWrite(ledHijau1,HIGH);
        }

        if (perintah == "TTUP1") {
            stat1 =false;
            relay1Off;
            digitalWrite(ledMerah1,HIGH);
            digitalWrite(ledHijau1,LOW);
        }

        // Perintah buka dan tutup manual pintu 2 -----
        if (perintah == "BUKA2") {
            stat2 =true;
            relay2On;
            digitalWrite(ledMerah2,LOW);
            digitalWrite(ledHijau2,HIGH);
        }

        if (perintah == "TTUP2") {
            stat2 =false;
            relay2Off;
            digitalWrite(ledMerah2,HIGH);
            digitalWrite(ledHijau2,LOW);
        }

        // Perintah Atur Tanggal -----
        if (perintah ==String(F("TGGL"))) {

            int tgl      = data.substring(0, 2).toInt();
            int bulan   = data.substring(3, 5).toInt();
            int tahun   = data.substring(6, 10).toInt();
            int jam     = data.substring(11, 13).toInt();
            int menit   = data.substring(14, 16).toInt();
            int detik   = data.substring(17, 19).toInt();

            aturWaktu(jam, menit, detik, tgl, bulan, tahun);

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    printXY1(0, 0, F("JAM DAN TANGGAL"));
    printXY1(0, 1, F("  DIPERBAHARUI  "));
    printXY2(0, 0, F("JAM DAN TANGGAL"));
    printXY2(0, 1, F("  DIPERBAHARUI  "));
    delay(1000);
    lcd1.clear();
    lcd2.clear();
}

// Perintah Atur Tanggal Keluar 1 -----
if (perintah ==String(F("SLS1"))) {

    int tgl      = data.substring(0, 2).toInt();
    int bulan    = data.substring(3, 5).toInt();
    int tahun    = data.substring(6, 10).toInt();

    tglSelesai1 = RtcDateTime(tahun, bulan, tgl, 0, 0, 0);
    EEPROM.put(almtTglSls1, tglSelesai1);

    debug.println(tgl);
    debug.println(bulan);
    debug.println(tahun);

    printXY1(0, 0, F(" BATAS TANGGAL "));
    printXY1(0, 1, F("  DIPERBAHARUI  "));
    delay(1000);
    lcd1.clear();
}

// Perintah Atur Tanggal Keluar 2 -----
if (perintah ==String(F("SLS2"))) {

    int tgl      = data.substring(0, 2).toInt();
    int bulan    = data.substring(3, 5).toInt();
    int tahun    = data.substring(6, 10).toInt();

    tglSelesai2 = RtcDateTime(tahun, bulan, tgl, 0, 0, 0);
    EEPROM.put(almtTglSls2, tglSelesai2);

    debug.println(tgl);
    debug.println(bulan);
    debug.println(tahun);

    printXY2(0, 0, F(" BATAS TANGGAL "));
    printXY2(0, 1, F("  DIPERBAHARUI  "));
    delay(1000);
    lcd1.clear();
}

}

bacaRTC();
hitungHari();
Serial.print("Sisa hari 1: ");   Serial.println(sisaHari1);
Serial.print("Sisa hari 2: ");   Serial.println(sisaHari2);

// Perintah atur nama 1 -----
if (perintah ==String(F("NAMA1"))) {
    data.toCharArray(nama1, sizeof(nama1) - 1);
    EEPROM.put(almtNama1, nama1);
}

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    printXY1(0, 0, F("    NAMA 1    "));
    printXY1(0, 1, F("  DIPERBAHARUI  "));
    delay(1000);
    lcd1.clear();

    printXY1(0, 0, nama1);
    delay(1000);
}

// Perintah atur nama 2 -----
if (perintah ==String(F("NAMA2"))) {
    data.toCharArray(nama2, sizeof(nama2) - 1);
    EEPROM.put(almtNama2, nama2);

    printXY2(0, 0, F("    NAMA 2    "));
    printXY2(0, 1, F("  DIPERBAHARUI  "));
    delay(1000);
    lcd2.clear();

    printXY2(0, 0, nama2);
    delay(1000);
}

// masuk mode set kartu -----
if (perintah == "SET") {
    modeSetting =true;
    lcd1.clear();
    lcd2.clear();
    tampilModeSetKartu();
}

// keluar mode set kartu -----
if (perintah == "EXIT") {
    modeSetting =false;
}

// masuk mode datalogger -----
if (perintah == "TGLG") {
    debug.println(F(">Logger"));

    namaFile = data;
    debug.println("Nama File: "+ namaFile);
}

// perintah baca file -----
if (perintah == "BACA") {
    debug.println(F(">Baca File"));

    File datalog =SD.open(namaFile);
    if (datalog) {
        datalog.close();
        debug.println(F(">File berhasil dibuka"));
        dumpFile(namaFile);

        int jmlBaris = bacaJumlahBaris(namaFile);
        debug.println(String(jmlBaris, DEC) +" Baris");

        for (int i = 1; i <= jmlBaris; i++) {
            String txt = bacaFileBaris(namaFile, i);

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        debug.print(txt);
        bth.print(txt);
    }
    bth.println("####");
    debug.println("####");
}
else {
    bth.println("Tidak Ada Catatan");
    bth.println("####");
    debug.println(F(">File tak tersedia / gagal dibuka"));
}
}
}
// -----
-----^

// jika Mode: NORMAL (bukan dalam mode setting) -----
-----v
if (modeSetting ==false) {
    tampilPesanAwal();

    // periksa RFID pintu 1 jika ada kartu yang ditempel
    if (bacaRFID1()) {
        debug.println(F("> Pintu 1"));
        lcd1.clear();
        if (bandingkan(ID1, ID1_1) ==true|| bandingkan(ID1, ID1_2)
==true||
        bandingkan(ID1, ID1_3) ==true|| bandingkan(ID1, ID1_4)
==true||
        bandingkan(ID1, ID1_5) ==true)
        {
            if (sisaHari1 > 0) { // jika sisa hari masih
                debug.println(F("\tDiterima"));

                if (stat1 ==false) {
                    stat1 =true;
                    relay1On;
                    digitalWrite(ledMerah1,LOW);
                    digitalWrite(ledHijaul,HIGH);

                    simpanDataKeluarMasuk("Pintu 1","Diterima","Masuk");
                    printXY1(0, 0, F(" AKSES DITERIMA "));
                    printXY1(0, 1, F("-----"));
                    delay(1500);
                    lcd1.clear();
                    printXY1(0, 0, F(" Selamat Datang "));
                    printXY1(0, 1, nama1);
                    delay(1500);
                }
                elseif (stat1 ==true) {
                    stat1 =false;
                    relay1Off;
                    digitalWrite(ledMerah1,HIGH);
                    digitalWrite(ledHijaul,LOW);

                    simpanDataKeluarMasuk("Pintu 1","Diterima","Keluar");
                    printXY1(0, 0, F(" PINTU TERKUNCI "));
                    printXY1(0, 1, F("-----"));
                }
            }
        }
    }
}

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        delay(1000);
    }
}
else {
    debug.println(F("\tWaktu Habis"));
    stat1 =false;
    relay1Off;

    simpanDataKeluarMasuk("Pintu 1","Ditolak","Terkunci");
    printXY1(0, 0, F("Bts. Waktu Habis"));
    printXY1(0, 1, F(" Hub. Pengelola "));
    merah1Kedip(3, 500);
    digitalWrite(ledMerah1,HIGH);
    digitalWrite(ledHijau1,LOW);
}
}
else {
    debug.println(F("\tDitolak"));

    simpanDataKeluarMasuk("Pintu 1","Ditolak","Terkunci");
    printXY1(0, 0, F(" AKSES DITOLAK! "));
    printXY1(0, 1, F("-----"));
    stat1 =false;
    relay1Off;
    digitalWrite(ledMerah1,HIGH);
    digitalWrite(ledHijau1,LOW);
    delay(1000);
}
}

// periksa RFID pintu 2 jika ada kartu yang ditempel
if (bacaRFID2()) {
    debug.println(F("> Pintu 2"));
    lcd2.clear();
    if (/*bandingkan(ID2, tag2) == true ||*/
    bandingkan(ID2, ID2_1) ==true|| bandingkan(ID2, ID2_2)
==true||
    bandingkan(ID2, ID2_3) ==true|| bandingkan(ID2, ID2_4)
==true)
    {
        if (sisaHari2 > 0) { // jika sisa hari habis
            debug.println(F("\tDiterima"));

            if (stat2 ==false) {
                stat2 =true;
                relay2On;
                digitalWrite(ledMerah2,LOW);
                digitalWrite(ledHijau2,HIGH);

                simpanDataKeluarMasuk("Pintu 2","Diterima","Masuk");
                printXY2(0, 0, F(" AKSES DITERIMA "));
                printXY2(0, 1, F("-----"));
                delay(1500);
                lcd2.clear();
                printXY2(0, 0, F(" Selamat Datang "));
                printXY2(0, 1, nama2);
                delay(1500);
            }
            elseif (stat2 ==true) {

```



```

    printXY1(0, 0, F("PINTU 1 DIRESET"));
    printXY1(0, 1, F("-----"));
    delay(1000);
    lcd1.clear();
    tampilModeSetKartu();
}

// Perintah Reset Kartu 2 -----
if (perintah ==String(F("RST2"))) {
    EEPROM.write(0x06, 0x00);
    EEPROM.write(0x07, 0x00);
    EEPROM.write(0x08, 0x00);
    EEPROM.write(0x09, 0x00);
    EEPROM.write(0x0A, 0x00);

    EEPROM.put(almtID2_1,NULL);
    EEPROM.put(almtID2_2,NULL);
    EEPROM.put(almtID2_3,NULL);
    EEPROM.put(almtID2_4,NULL);
    EEPROM.put(almtID2_5,NULL);
    bacaEEPROM();

    printXY2(0, 0, F("PINTU 2 DIRESET"));
    printXY2(0, 1, F("-----"));
    delay(1000);
    lcd2.clear();
    tampilModeSetKartu();
}

// Pintu 1 -----
--
if (bacaRFID1()) {
    lcd1.clear();
    printXY1(0, 0,"ID: ");
    tampilUIDLCD1(4, 0, ID1);
    kirimUID(ID1);

    if (bandingkan(ID1, ID1_1))      noKartul = 1;
    elseif (bandingkan(ID1, ID1_2))  noKartul = 2;
    elseif (bandingkan(ID1, ID1_3))  noKartul = 3;
    elseif (bandingkan(ID1, ID1_4))  noKartul = 4;
    elseif (bandingkan(ID1, ID1_5))  noKartul = 5;
    else                               noKartul = 0;

    if (noKartul == 0) {
        printXY1(0, 1,"BELUM TERDAFTAR");
    }
    else {
        printXY1(0, 1,"SUDAH TERDAFTAR");
    }
    delay(1000);
}

// jika kartu belum terdaftar -----
if (noKartul == 0) {
    if (perintah == "SET1"&&
        !(simpanKartul[0] ==true&&
           impanKartul[1] ==true&&
           impanKartul[2] ==true&&

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        simpanKartul[3] ==true&&
        simpanKartul[4] ==true ))
{
    if (simpanKartul[0] ==false) {
        simpanKartul[0] =true;
        memcpy(ID1_1, ID1, 4);
        EEPROM.write(0x01,true);
        EEPROM.put(almtID1_1, ID1_1);
        goto exit1;
    }
    if (simpanKartul[1] ==false) {
        simpanKartul[1] =true;
        memcpy(ID1_2, ID1, 4);
        EEPROM.write(0x02,true);
        EEPROM.put(almtID1_2, ID1_2);
        goto exit1;
    }
    if (simpanKartul[2] ==false) {
        simpanKartul[2] =true;
        memcpy(ID1_3, ID1, 4);
        EEPROM.write(0x03,true);
        EEPROM.put(almtID1_3, ID1_3);
        goto exit1;
    }
    if (simpanKartul[3] ==false) {
        simpanKartul[3] =true;
        memcpy(ID1_4, ID1, 4);
        EEPROM.write(0x04,true);
        EEPROM.put(almtID1_4, ID1_4);
        goto exit1;
    }
    if (simpanKartul[4] ==false) {
        simpanKartul[4] =true;
        memcpy(ID1_5, ID1, 4);
        EEPROM.write(0x05,true);
        EEPROM.put(almtID1_5, ID1_5);
        goto exit1;
    }
}
exit1:
    lcd1.clear();
    printXY1(0, 0,"KARTU DISIMPAN");
    delay(1000);
    tampilModeSetKartu();
}
elseif (perintah == "SET1"&&
        simpanKartul[0] ==true&&
        simpanKartul[1] ==true&&
        simpanKartul[2] ==true&&
        simpanKartul[3] ==true&&
        simpanKartul[4] ==true )
{
    lcd1.clear();
    printXY1(0, 0,"MEMORY PENUH");
    delay(1000);
    tampilModeSetKartu();
}
}

// jika kartu sudah terdaftar -----

```

```

else {
  if (perintah == "HPS1") {
    switch (noKartu1) {
      case 1:
        simpanKartu1[0] =false;
        memset(ID1_1, 0x00, 4);
        EEPROM.write(0x01,false);
        EEPROM.put(almtID1_1, ID1_1);
        break;
      case 2:
        simpanKartu1[1] =false;
        memset(ID1_2, 0x00, 4);
        EEPROM.write(0x02,false);
        EEPROM.put(almtID1_2, ID1_2);
        break;
      case 3:
        simpanKartu1[2] =false;
        memset(ID1_3, 0x00, 4);
        EEPROM.write(0x03,false);
        EEPROM.put(almtID1_3, ID1_3);
        break;
      case 4:
        simpanKartu1[3] =false;
        memset(ID1_4, 0x00, 4);
        EEPROM.write(0x04,false);
        EEPROM.put(almtID1_4, ID1_4);
        break;
      case 5:
        simpanKartu1[4] =false;
        memset(ID1_5, 0x00, 4);
        EEPROM.write(0x05,false);
        EEPROM.put(almtID1_5, ID1_5);
        break;
    }
    lcd1.clear();
    printXY1(0, 0, "KARTU DIHAPUS");
    delay(1000);
    tampilModeSetKartu();
  }
}

// Pintu 2 -----
--
if (bacaRFID2()) {
  lcd2.clear();
  printXY2(0, 0, "ID: ");
  tampilUIDLCD2(4, 0, ID2);
  kirimUID(ID2);

  if (bandingkan(ID2, ID2_1))      noKartu2 = 1;
  elseif (bandingkan(ID2, ID2_2))  noKartu2 = 2;
  elseif (bandingkan(ID2, ID2_3))  noKartu2 = 3;
  elseif (bandingkan(ID2, ID2_4))  noKartu2 = 4;
  else                               noKartu2 = 0;

  if (noKartu2 == 0) {
    printXY2(0, 1, "BELUM TERDAFTAR");
  }
}

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else {
    printXY2(0, 1, "SUDAH TERDAFTAR");
}
delay(1000);
}

// jika kartu belum terdaftar -----
if (noKartu2 == 0) {
    if (perintah == "SET2" &&
        !(simpanKartu2[0] == true &&
         impanKartu2[1] == true &&
         impanKartu2[2] == true &&
         impanKartu2[3] == true))
    {
        if (simpanKartu2[0] == false) {
            simpanKartu2[0] = true;
            memcpy(ID2_1, ID2, 4);
            EEPROM.write(0x06, true);
            EEPROM.put(almtID2_1, ID2_1);
            goto exit2;
        }
        if (simpanKartu2[1] == false) {
            simpanKartu2[1] = true;
            memcpy(ID2_2, ID2, 4);
            EEPROM.write(0x07, true);
            EEPROM.put(almtID2_2, ID2_2);
            goto exit2;
        }
        if (simpanKartu2[2] == false) {
            simpanKartu2[2] = true;
            memcpy(ID2_3, ID2, 4);
            EEPROM.write(0x08, true);
            EEPROM.put(almtID2_3, ID2_3);
            goto exit2;
        }
        if (simpanKartu2[3] == false) {
            simpanKartu2[3] = true;
            memcpy(ID2_4, ID2, 4);
            EEPROM.write(0x09, true);
            EEPROM.put(almtID2_4, ID2_4);
            goto exit2;
        }
    }
exit2:
    lcd2.clear();
    printXY2(0, 0, "KARTU DISIMPAN");
    delay(1000);
    tampilModeSetKartu();
}
elseif (perintah == "SET2" &&
        simpanKartu2[0] == true &&
        simpanKartu2[1] == true &&
        simpanKartu2[2] == true &&
        simpanKartu2[3] == true)
{
    lcd2.clear();
    printXY2(0, 0, "MEMORY PENUH");
    delay(1000);
    tampilModeSetKartu();
}

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}

// jika kartu sudah terdaftar -----
else {
  if (perintah == "HPS2") {
    switch (noKartu2) {
      case 1:
        simpanKartu2[0] =false;
        memset(ID2_1, 0x00, 4);
        EEPROM.write(0x06, false);
        EEPROM.put(almtID2_1, ID2_1);
        break;
      case 2:
        simpanKartu2[1] =false;
        memset(ID2_2, 0x00, 4);
        EEPROM.write(0x07, false);
        EEPROM.put(almtID2_2, ID2_2);
        break;
      case 3:
        simpanKartu2[2] =false;
        memset(ID2_3, 0x00, 4);
        EEPROM.write(0x08, false);
        EEPROM.put(almtID2_3, ID2_3);
        break;
      case 4:
        simpanKartu2[3] =false;
        memset(ID2_4, 0x00, 4);
        EEPROM.write(0x09, false);
        EEPROM.put(almtID2_4, ID2_4);
        break;
    }
    lcd2.clear();
    printXY2(0, 0, "KARTU DIHAPUS");
    delay(1000);
    tampilModeSetKartu();
  }
  perintah = "";
}
// -----
-----^
}

```

Sub Program

```
// Baca RFID 1
bool bacaRFID1() {
    if (!rfid1.PICC_IsNewCardPresent())
        returnfalse;
    if (!rfid1.PICC_ReadCardSerial())
        returnfalse;
    memcpy(ID1, rfid1.uid.uidByte, sizeof(ID1));
    rfid1.PICC_HaltA();

    debug.print("ID: "); printUID(ID1);
    debug.println("-----v");
    printUID(ID1_1);
    printUID(ID1_2);
    printUID(ID1_3);
    printUID(ID1_4);
    debug.println("-----^");
    returntrue;
}

// Baca RFID 2
bool bacaRFID2() {
    if (!rfid2.PICC_IsNewCardPresent())
        returnfalse;
    if (!rfid2.PICC_ReadCardSerial())
        returnfalse;
    memcpy(ID2, rfid2.uid.uidByte, sizeof(ID2));
    rfid2.PICC_HaltA();

    debug.print("ID: "); printUID(ID2);
    debug.println("-----v");
    printUID(ID2_1);
    printUID(ID2_2);
    printUID(ID2_3);
    printUID(ID2_4);
    debug.println("-----^");
    returntrue;
}

// Inisialisasi SD Card
void initSDCard() {
    debug.println(F(">Inisialisasi SDCard"));

    if (!SD.begin(CS_PIN)) {
        debug.println(F("\tInisialisasi SDCard Gagal"));
        statSDCard =false;
    } else {
```

```

        debug.println(F("\tInisialisasi SDCard Berhasil"));
        statSDCard =true;
    }
}

// Inisialisasi RTC
void initRTC() {
    debug.println(F("> Init RTC"));

    RtcDateTime compiled = RtcDateTime(__DATE__, __TIME__);
    rtc.Begin();
    if (!rtc.IsDateTimeValid()) {
        rtc.SetDateTime(compiled);
    }

    if (!rtc.GetIsRunning()) {
        rtc.SetIsRunning(true);
    }

    if (!rtc.IsDateTimeValid() ||!rtc.GetIsRunning()) {
        debug.println("\tInisialisasi Gagal");
        statRTC =false;
    }
    else {
        debug.println("\tInisialisasi Berhasil");
        statRTC =true;

        char buf[20];
        now = rtc.GetDateTime();
        sprintf(buf, "\t%02d:%02d:%02d %02d-%02d-%4d",
            now.Hour(), now.Minute(), now.Second(),
            now.Day(), now.Month(), now.Year());
        Serial.println(buf);
    }
}

// Simpan data keluar masuk
void
simpanDataKeluarMasuk(char*pintu, char*statusTerima, char*status) {
    char yangDisimpan[50];
    char namaFile[20];

    now = rtc.GetDateTime();
    sprintf(namaFile, "%02d%02d%4d.txt",
        now.Day(), now.Month(), now.Year());

    File dataFile =SD.open(namaFile, FILE_WRITE);

    // siapkan data
    sprintf(yangDisimpan, "%02d:%02d:%02d %02d-%02d-%4d %s %s %s",
        now.Hour(), now.Minute(), now.Second(),
        now.Day(), now.Month(), now.Year(),
        pintu, statusTerima, status);

    debug.println(F("> Menyimpan Data"));
    debug.println("\t"+String(namaFile));
    debug.println("\t"+String(yangDisimpan));

    // Simpan data ke SDCard

```

```

    if (dataFile) {
        dataFile.println(yangDisimpan);
        dataFile.close();
    }
    else {
        debug.println(F("> Kesalahan saat membuka File"));
    }
}

// terima data bluetooth
void terimaDataBluetooth() {
    if (bth.available()) {
        delay(5);

        while (bth.available()) {
            char c = bth.read();

            if (c == '\n') {
                bufTerima = "";
                dataBaru = false;
                rxFlag = true;
            }

            if (c != '^' && c != '\n' && rxFlag == true) {
                bufTerima += c;
            }
            else {
                if (c == '^') {
                    bth.flush();
                    dataBaru = true;
                }
            }
        }
    }
}

// tampilkan pesan awal di LCD
void tampilPesanAwal() {
    printXY1(0, 0, F(" -- Silahkan -- "));
    printXY1(0, 1, F("Tempelkan Kartu"));
    printXY2(0, 0, F(" -- Silahkan -- "));
    printXY2(0, 1, F("Tempelkan Kartu"));
}

// atur waktu RTC
void aturWaktu(int jam, int menit, int detik, int tgl, int bulan, int
tahun) {
    RtcDateTime set(tahun, bulan, tgl, jam, menit, detik);
    rtc.SetDateTime(set);
}

// bandingkan ID kartu a dan b
bool bandingkan(byte a[], byte b[]) {
    if (a[0] == b[0] &&
        a[1] == b[1] &&
        a[2] == b[2] &&
        a[3] == b[3])
    {
        return true;
    }
}

```

```

    }
    else {
        return false;
    }
}

// tampilkan ID ke Serial Monitor
void printUID(byte UID[]) {
    for (int i = 0; i < 4; i++) {
        // Serial.print("0x");
        Serial.print(UID[i] < 0x10 ? "0:" : "");
        Serial.print(UID[i], HEX);
        // Serial.print(" ");
    }
    Serial.println();
}

// tampilkan pesan mode set kartu ke LCD
void tampilModeSetKartu() {
    printXY1(0, 0, F("    SET KARTU    "));
    printXY1(0, 1, F("TEMPELKAN KARTU"));
    printXY2(0, 0, F("    SET KARTU    "));
    printXY2(0, 1, F("TEMPELKAN KARTU"));
}

// tampilkan UID ke LCD 1
void tampilUIDLCD1(char x, char y, byte UID[]) {
    char buf[17];
    sprintf(buf, "%02X%02X%02X%02X", UID[0], UID[1], UID[2], UID[3]);
    printXY1(x, y, buf);
}

// tampilkan UID ke LCD 2
void tampilUIDLCD2(char x, char y, byte UID[]) {
    char buf[17];
    sprintf(buf, "%02X%02X%02X%02X", UID[0], UID[1], UID[2], UID[3]);
    printXY2(x, y, buf);
}

// kirim UID ke android
void kirimUID(byte UID[]) {
    char buf[17];
    sprintf(buf, "%02X%02X%02X%02X", UID[0], UID[1], UID[2], UID[3]);
    bth.print(buf);
}

// dump file ke serial monitor
void dumpFile(String namaFile) {
    File filenya = SD.open(namaFile);
    if (filenya) {
        while (filenya.available()) {
            debug.write(filenya.read());
        }
    }
    filenya.close();
}

// baca jumlah baris
int bacaJumlahBaris(String namFile) {

```

```

int jmlBaris = 0;

File filenya =SD.open(namaFile);
if (filenya) {
    while (filenya.available()) {
        if (filenya.read() =='\n') jmlBaris++;
    }
}
filenya.close();
return jmlBaris;
}

// baca file per baris
String bacaFileBaris(String namaFile,uint32_t baris) {
    int jmlBaris = bacaJumlahBaris(namaFile);
    int hitBaris = 0;
    String temp ="";

    if (baris > jmlBaris) return"Akhir";

    File filenya =SD.open(namaFile);
    if (filenya) {
        while (hitBaris < baris - 1) {
            if (filenya.read() =='\n') hitBaris++;
        }

        while (filenya.available()) {
            char c = filenya.read();
            temp += c;

            if (c =='\n') {
                filenya.close();
                return temp;
            }
        }
    }
    return"File tidak ditemukan / gagal dibuka";
}

void merah1Kedip(int ulang,int tunda) {
    for (int n = 0; n < ulang; n++) {
        digitalWrite(ledMerah1,HIGH);
        delay(tunda);
        digitalWrite(ledMerah1,LOW);
        delay(tunda);
    }
}

void merah2Kedip(int ulang,int tunda) {
    for (int n = 0; n < ulang; n++) {
        digitalWrite(ledMerah2,HIGH);
        delay(tunda);
        digitalWrite(ledMerah2,LOW);
        delay(tunda);
    }
}

void bacaRTC() {
    if (statRTC) {

```

```

    now = rtc.GetDateTime();
}
}

long hitungHari(int tanggal,int bulan,int tahun) {
    long a, b, hari;

    if (bulan < 3) {
        tahun -= 1;
        bulan += 12;
    }

    a          = (long)(tahun / 100);
    b          = 2 - a + ( (long) (a / 4));
    hari = (long)(365.25 * (tahun + 4716)) + (30.6001 * (bulan + 1))
+ tanggal + b - 1524;

    return hari;
}

int hitungSisaHari(int tglMulai,int blnMulai,int thnMulai,int
tglSlse,int blnSlse,int thnSlse) {
    int mulai  = hitungHari(tglMulai, blnMulai, thnMulai);
    int selesai = hitungHari(tglSlse, blnSlse, thnSlse);

    return mulai - selesai;
}

void hitungHari() {
    sisaHari1 = hitungSisaHari(tglSelesai1.Day(),
    tglSelesai1.Month(), tglSelesai1.Year(),
                                now.Day(), now.Month(), now.Year());
    sisaHari2 = hitungSisaHari(tglSelesai2.Day(),
    tglSelesai2.Month(), tglSelesai2.Year(),
                                now.Day(), now.Month(), now.Year());
    if (sisaHari1 < 0) sisaHari1 = 0;
    if (sisaHari2 < 0) sisaHari2 = 0;
}

void kosongkanEEPROM() {
    EEPROM.write(0x00, 0x37);
    EEPROM.write(0x01, 0x00);
    EEPROM.write(0x02, 0x00);
    EEPROM.write(0x03, 0x00);
    EEPROM.write(0x04, 0x00);
    EEPROM.write(0x05, 0x00);
    EEPROM.write(0x06, 0x00);
    EEPROM.write(0x07, 0x00);
    EEPROM.write(0x08, 0x00);
    EEPROM.put(almtNama1, NULL);
    EEPROM.put(almtNama2, NULL);
    EEPROM.put(almtID1_1, NULL);
    EEPROM.put(almtID1_2, NULL);
    EEPROM.put(almtID1_3, NULL);
    EEPROM.put(almtID1_4, NULL);
    EEPROM.put(almtID2_1, NULL);
    EEPROM.put(almtID2_2, NULL);
    EEPROM.put(almtID2_3, NULL);
    EEPROM.put(almtID2_4, NULL);
}

```

```
}  
  
void bacaEEPROM() {  
    simpanKartu1[0] =EEPROM.read(0x01);  
    simpanKartu1[1] =EEPROM.read(0x02);  
    simpanKartu1[2] =EEPROM.read(0x03);  
    simpanKartu1[3] =EEPROM.read(0x04);  
    simpanKartu1[4] =EEPROM.read(0x05);  
  
    simpanKartu2[0] =EEPROM.read(0x06);  
    simpanKartu2[1] =EEPROM.read(0x07);  
    simpanKartu2[2] =EEPROM.read(0x08);  
    simpanKartu2[3] =EEPROM.read(0x09);  
    simpanKartu2[4] =EEPROM.read(0x0A);  
  
    EEPROM.get(almtNama1, nama1);  
    EEPROM.get(almtNama2, nama2);  
    EEPROM.get(almtID1_1, ID1_1);  
    EEPROM.get(almtID1_2, ID1_2);  
    EEPROM.get(almtID1_3, ID1_3);  
    EEPROM.get(almtID1_4, ID1_4);  
    EEPROM.get(almtID1_5, ID1_5);  
  
    EEPROM.get(almtID2_1, ID2_1);  
    EEPROM.get(almtID2_2, ID2_2);  
    EEPROM.get(almtID2_3, ID2_3);  
    EEPROM.get(almtID2_4, ID2_4);  
    EEPROM.get(almtID2_5, ID2_5);  
  
    EEPROM.get(almtTglSls1, tglSelesai1);  
    EEPROM.get(almtTglSls2, tglSelesai2);  
}
```