

LAMPIRAN

LAMPIRAN A

Listing Program Arduino pada Esp32

```
#include <LiquidCrystal_I2C.h>

/* set the LCD address to 0x27 for a 16 chars and 2 line display*/
LiquidCrystal_I2C lcd(0x27, 16, 2);

#include <WiFi.h>
#include <FirebaseESP32.h>

// Provide the RTDB payload printing info and other helper functions.
#include "addons/RTDBHelper.h"

/* 1. Define the WiFi credentials */
#define WIFI_SSID "apajaneh"
#define WIFI_PASSWORD "sedingaeh"

// #define WIFI_SSID "apajaneh"
// #define WIFI_PASSWORD "sedingaeh"

/* 2. If work with RTDB, define the RTDB URL and database secret */
// #define DATABASE_URL "https://vendingmachinejakamaulana-
// default-rtdb.firebaseio.com/" //<databaseName>.firebaseio.com or
// <databaseName>.<region>.firebasedatabase.app
// #define DATABASE_SECRET "9Qtam0VzfaWNyvmfdBzKBfGm2ailACS8DixRNE5N"
// #define DATABASE_URL "https://iot-vending-machine-f3b4c-default-
// rtdb.firebaseio.com/" //<databaseName>.firebaseio.com or
// <databaseName>.<region>.firebasedatabase.app
// #define DATABASE_SECRET "IEuV06Y7FRnSohrorPu9PeY7uCnyzMIFogbKUnej"

/* 3. Define the Firebase Data object */
FirebaseData fdb;

/* 4, Define the FirebaseAuth data for authentication data */
```

```

FirebaseAuth auth;

/* Define the FirebaseConfig data for config data */
FirebaseConfig config;

// Parent Node (to be updated in every loop)
String parentPath;

int timestamp;
FirebaseJson json;

#define led_indikator_ESP32 2

// input sensor
#define S1 23 // sensor proximity infrared 1 (untuk slot) terhubung ke
pin 23 dari ESP32 makanan jatuh
#define S2 15 // sensor proximity infrared 2 terhubung ke pin 15 dari
ESP32 makanan jatuh
#define S3 34 // sensor ir kosong slot 1
#define S4 35 // sensor ir kosong slot 2
#define S5 39 // sensor ir kosong slot 3
#define S6 36 // sensor ir kosong slot 4

String nama_snack1 = "Momogi ";
String nama_snack2 = "Saltcheese";
String nama_snack3 = "Regal ";
String nama_snack4 = "Better ";

int harga_snack1 = 1000;
int harga_snack2 = 9000;
int harga_snack3 = 4000;
int harga_snack4 = 1500;

String pilih_snack = "0";
String status_transaksi = "-1";

String nama_user = "";
String Saldo_user = "";

```

```

//https://diyi0t.com/keypad-arduino-esp8266-esp32/
#include <Keypad.h>

const byte ROWS = 4; //four rows
const byte COLS = 4; //three columns
char keys[ROWS][COLS] = {
  {'1', '2', '3', 'A'},
  {'4', '5', '6', 'B'},
  {'7', '8', '9', 'C'},
  {'*', '0', '#', 'D'}
};
byte rowPins[ROWS] = {32, 33, 25, 26}; //connect to the row pinouts of
the keypad
byte colPins[COLS] = {27, 14, 12, 13}; //connect to the column pinouts
of the keypad

Keypad keypad = Keypad( makeKeymap(keys), rowPins, colPins,
ROWS, COLS );

#define TIMER_INTERRUPT_DEBUG    0
#define ISR_SERVO_DEBUG        0

// Select different ESP32 timer number (0-3) to avoid conflict
#define USE_ESP32_TIMER_NO      3

#include "ESP32_ISR_Servo.h"

// sudut 80 dia berhenti
// sudut 90 berputar searah clock wise
#define PIN_D4          4           // Pin D4 mapped to pin
GPIO4/ADC10/TOUCH0 of ESP32
#define PIN_D5          5           // Pin D5 mapped to pin
GPIO5/SPISS/VSPI_SS of ESP32
#define PIN_D18         18          // Pin D18 mapped to pin
GPIO18/VSPI_SCK of ESP32
#define PIN_D19         19          // Pin D19 mapped to pin
GPIO19/VSPI_MISO of ESP32

// Published values for SG90 servos; adjust if needed

```

```

#define MIN_MICROS    800
#define MAX_MICROS    2450

int servo1 = -1;
int servo2 = -1;
int servo3 = -1;
int servo4 = -1;

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

  pinMode(S1, INPUT_PULLUP);
  pinMode(S2, INPUT_PULLUP);
  pinMode(S3, INPUT_PULLUP);
  pinMode(S4, INPUT_PULLUP);
  pinMode(S5, INPUT_PULLUP);
  pinMode(S6, INPUT_PULLUP);

  //Select ESP32 timer USE_ESP32_TIMER_NO
  ESP32_ISR_Servos.useTimer(USE_ESP32_TIMER_NO);

  servo1 = ESP32_ISR_Servos.setupServo(PIN_D18, MIN_MICROS,
MAX_MICROS);
  servo2 = ESP32_ISR_Servos.setupServo(PIN_D19, MIN_MICROS,
MAX_MICROS);
  servo3 = ESP32_ISR_Servos.setupServo(PIN_D5, MIN_MICROS,
MAX_MICROS);
  servo4 = ESP32_ISR_Servos.setupServo(PIN_D4, MIN_MICROS,
MAX_MICROS);

  ESP32_ISR_Servos.setPosition(servo1, 75);
  ESP32_ISR_Servos.setPosition(servo2, 75);
  ESP32_ISR_Servos.setPosition(servo3, 75);
  ESP32_ISR_Servos.setPosition(servo4, 75);

  // initialize the LCD
  lcd.begin();
  // Turn on the backlight and print a message.

```

```

lcd.backlight();

lcd.clear();

pinMode(led_indikator_ESP32, OUTPUT);
digitalWrite(led_indikator_ESP32, LOW); // turn off
// konek ke wifi
connectWiFi();

/* Assign the database URL and database secret(required) */
config.database_url = DATABASE_URL;
config.signer.tokens.legacy_token = DATABASE_SECRET;

// Server response read timeout in ms (1 sec - 1 min).
config.timeout.serverResponse = 1 * 1000;

Firebase.reconnectWiFi(true);

/* Initialize the library with the Firebase authen and config */
Firebase.begin(&config, &auth);

Serial.println("Startup is complete");

lcd.clear();
}

void loop()
{
  Serial.print("Sensor ");
  Serial.print("S1:");
  Serial.print(digitalRead(S1));
  Serial.print("\tS2:");
  Serial.println(digitalRead(S2));
  Serial.print("\tS3:");
  Serial.println(digitalRead(S3));
  Serial.print("\tS4:");
  Serial.println(digitalRead(S4));
  Serial.print("\tS5:");

```

```

Serial.println(digitalRead(S5));
Serial.print("\tS6:");
Serial.println(digitalRead(S6));

    Firebase.setString(fbdo, "/database_alat/sensor_1", digitalRead(S1)); //
update data ke Firebase
    Firebase.setString(fbdo, "/database_alat/sensor_2", digitalRead(S2)); //
update data ke Firebase
    Firebase.setString(fbdo, "/database_alat/sensor_3", digitalRead(S3)); //
update data ke Firebase
    Firebase.setString(fbdo, "/database_alat/sensor_4", digitalRead(S4)); //
update data ke Firebase
    Firebase.setString(fbdo, "/database_alat/sensor_5", digitalRead(S5)); //
update data ke Firebase
    Firebase.setString(fbdo, "/database_alat/sensor_6", digitalRead(S6)); //
update data ke Firebase

lcd.setCursor(0, 0);
lcd.print("Pilih Snack : ");

char key = keypad.getKey();

if (key == '1')
{
    pilih_snack = "1";
    lcd.setCursor(14, 0);
    lcd.print(pilih_snack);
    lcd.setCursor(0, 1);
    lcd.print(nama_snack1);
    lcd.setCursor(11, 1);
    lcd.print(harga_snack1);

    Firebase.setString(fbdo, "/database_alat/pilih_snack", pilih_snack); //
update data ke Firebase
}
else if (key == '2')
{
    pilih_snack = "2";
    lcd.setCursor(14, 0);

```

```

    lcd.print(pilih_snack);
    lcd.setCursor(0, 1);
    lcd.print(nama_snack2);
    lcd.setCursor(11, 1);
    lcd.print(harga_snack2);

    Firebase.setString(fbdo, "/database_alat/pilih_snack", pilih_snack); //
update data ke Firebase
}
else if (key == '3')
{
    pilih_snack = "3";
    lcd.setCursor(14, 0);
    lcd.print(pilih_snack);
    lcd.setCursor(0, 1);
    lcd.print(nama_snack3);
    lcd.setCursor(11, 1);
    lcd.print(harga_snack3);

    Firebase.setString(fbdo, "/database_alat/pilih_snack", pilih_snack); //
update data ke Firebase
}
else if (key == '4')
{
    pilih_snack = "4";
    lcd.setCursor(14, 0);
    lcd.print(pilih_snack);
    lcd.setCursor(0, 1);
    lcd.print(nama_snack4);
    lcd.setCursor(11, 1);
    lcd.print(harga_snack4);

    Firebase.setString(fbdo, "/database_alat/pilih_snack", pilih_snack); //
update data ke Firebase
}
else if (key == 'A') // jika dipencet A maka snack yang dipilih akan
dicancel artinya dihapus dari lcd dan variabel pilih_snack direset ke 0
{
    lcd.clear();

```

```

    pilih_snack = "0"; // direset ke 0

    Firebase.setString(fbdo, "/database_alat/pilih_snack", pilih_snack); //
update data ke Firebase
}
// Cek nilai dari variabel yang ada di database firebase
if (Firebase.getString(fbdo, "/database_alat/status_transaksi") == true)
{
    if (fbdo.dataType() == "string")
    {
        status_transaksi = fbdo.stringData();
        Serial.println("\tvariable status_transaksi : " + status_transaksi);
    }
}

if (digitalRead(S3) == LOW)
{
    if (pilih_snack == "1" && status_transaksi == "1")
    {
        Serial.println("Transaksi Sukses! Servo1 ON");
        ESP32_ISR_Servos.setPosition(servo1, 120);

        while (1)
        {
            if (digitalRead(S1) == LOW)
            {
                ESP32_ISR_Servos.setPosition(servo1, 75);
                break;
            }
            delay(10);
        }
        lcd.clear();
        lcd.setCursor(0, 0);
        lcd.print("Silahkan Ambil");
        lcd.setCursor(0, 1);
        lcd.print("Snack");
        delay(3000);
        lcd.clear();
    }
}

```



```

    pilih_snack = "0";

    Firebase.setString(fbdo, "/database_alat/pilih_snack", pilih_snack); //
update data ke Firebase
    Firebase.setString(fbdo, "/database_alat/status_transaksi", "-1"); //
update data ke Firebase
    }
}
else if (digitalRead(S3) == HIGH) {
    pilih_snack = "0";
    Serial.println("Snack 1 Kososng");
    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("Snack 1 Kosong");
    delay(3000);
    lcd.clear();
    Firebase.setString(fbdo, "/database_alat/pilih_snack", pilih_snack); //
update data ke Firebase
    Firebase.setString(fbdo, "/database_alat/status_transaksi", "-1"); //
update data ke Firebase
    }
if (digitalRead(S4) == LOW)
{
    if (pilih_snack == "2" && status_transaksi == "1")
    {
        Serial.println("Transaksi Sukses! Servo2 ON");
        ESP32_ISR_Servos.setPosition(servo2, 120);

        while (1)
        {
            if (digitalRead(S2) == LOW)
            {
                ESP32_ISR_Servos.setPosition(servo2, 75);
                break;
            }
            delay(10);
        }
        lcd.clear();
        lcd.setCursor(0, 0);

```

```

lcd.print("Silahkan Ambil");
lcd.setCursor(0, 1);
lcd.print("Snack");
delay(3000);
lcd.clear();

pilih_snack = "0";

    Firebase.setString(fbdo, "/database_alat/pilih_snack", pilih_snack); //
update data ke Firebase
    Firebase.setString(fbdo, "/database_alat/status_transaksi", "-1"); //
update data ke Firebase
    }
if (digitalRead(S5) == LOW)
{
    if (pilih_snack == "3" && status_transaksi == "1")
    {
        Serial.println("Transaksi Sukses! Servo3 ON");
        ESP32_ISR_Servos.setPosition(servo3, 130);

        while (1)
        {
            if (digitalRead(S1) == LOW)
            {
                ESP32_ISR_Servos.setPosition(servo3, 75);
                break;
            }
            delay(10);
        }
        lcd.clear();
        lcd.setCursor(0, 0);
        lcd.print("Silahkan Ambil");
        lcd.setCursor(0, 1);
        lcd.print("Snack");
        delay(3000);
        lcd.clear();

        pilih_snack = "0";

```

```

    Firebase.setString(fbdo, "/database_alat/pilih_snack", pilih_snack); //
update data ke Firebase
    Firebase.setString(fbdo, "/database_alat/status_transaksi", "-1"); //
update data ke Firebase
}
if (digitalRead(S6) == LOW)
{
if (pilih_snack == "4" && status_transaksi == "1")
{
Serial.println("Transaksi Sukses! Servo4 ON");
ESP32_ISR_Servos.setPosition(servo4, 130);

while (1)
{
if (digitalRead(S2) == LOW)
{
ESP32_ISR_Servos.setPosition(servo4, 75);
break;
}
delay(10);
}
lcd.clear();
lcd.setCursor(0, 0);
lcd.print("Silahkan Ambil");
lcd.setCursor(0, 1);
lcd.print("Snack");
delay(3000);
lcd.clear();

pilih_snack = "0";

    Firebase.setString(fbdo, "/database_alat/pilih_snack", pilih_snack); //
update data ke Firebase
    Firebase.setString(fbdo, "/database_alat/status_transaksi", "-1"); //
update data ke Firebase
}
}
else if (digitalRead(S6) == HIGH) {
    pilih_snack = "0";
}

```

```

Serial.println("Snack 4 Kosong");
lcd.clear();
lcd.setCursor(0, 0);
lcd.print("Snack 4 Kosong");
delay(3000);
lcd.clear();
Firebase.setString(fbdo, "/database_alat/pilih_snack", pilih_snack); //
update data ke Firebase
Firebase.setString(fbdo, "/database_alat/status_transaksi", "-1"); //
update data ke Firebase
}
if (status_transaksi == "0")
{
  Serial.println("Transaksi Gagal! Saldo tidak cukup");

  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("Saldo Tdk Cukup");
  lcd.setCursor(0, 1);
  lcd.print("Segera Isi Saldo");

  ESP32_ISR_Servos.setPosition(servo1, 75);
  ESP32_ISR_Servos.setPosition(servo2, 75);
  ESP32_ISR_Servos.setPosition(servo3, 75);
  ESP32_ISR_Servos.setPosition(servo4, 75);

  delay(5000);
  lcd.clear();

  Firebase.setString(fbdo, "/database_alat/status_transaksi", "-1"); //
update data ke Firebase
}
}

void connectWiFi()
{
  Serial.print("Connect Wifi to ");
  Serial.println(WIFI_SSID);
}

```

```

lcd.setCursor(0, 0);
lcd.print("Konek ke Wifi");
lcd.setCursor(0, 1);
lcd.print(WIFI_SSID);

WiFi.begin(WIFI_SSID, WIFI_PASSWORD);

while (WiFi.status() != WL_CONNECTED)
{
  Serial.print(".");
  digitalWrite(led_indikator_ESP32, HIGH);
  delay(100);
  digitalWrite(led_indikator_ESP32, LOW);
  delay(100);

  if (millis() > 20000) { // jika 20 detik belum konek wifi maka
esp32akn restart
    ESP.restart(); // restart esp32
  }
}

digitalWrite(led_indikator_ESP32, HIGH); // turn on
Serial.print("Connected! ");
Serial.print("IP Address: ");
Serial.println(WiFi.localIP());
}

```

LAMPIRAN B

Block Puzzle Aplikasi Android

a. login

```
when Button_Masuk Click
do
  set global state to login
  if not is empty Text_Box_Nama_Akun Text and not is empty Text_Box_Kata_Sandi Text
  then
    set global nama_akun to Text_Box_Nama_Akun Text
    set global kata_sandi to Text_Box_Kata_Sandi Text
    set Firebase_Database1 Project Bucket to database_user_password
    call Firebase_Database1 Get Value
    tag get global nama_akun
    value If Tag Not There
  else
    call Notifier1 Show Alert
    notice Nama Akun dan Kata Sandi Wajib Diisi!
```

b. Daftar akun

```
when Button_Daftar_Akun_Baru Click
do
  set global state to register
  if not is empty Text_Box_Nama_Akun Text and not is empty Text_Box_Kata_Sandi Text
  then
    set global nama_akun to Text_Box_Nama_Akun Text
    set global kata_sandi to Text_Box_Kata_Sandi Text
    set Firebase_Database1 Project Bucket to database_user_password
    call Firebase_Database1 Get Tag List
  else
    call Notifier1 Show Alert
    notice Nama Akun dan Kata Sandi Wajib Diisi!
```

c. Top-up saldo akun admin

```
when Button1_top_up Click
do
  call Screen3 Hide Keyboard
  if is empty Text_Box1_nama_user Text
  then
    call Notifier1 Show Message Dialog
    message Mohon pilih salah satu akun pada list di atas.!!
    title Akun Tidak Diketahui
    button Text Mengerti
  else
    set global saldo_user to get global saldo_user + Text_Box2_saldo_user Text
    set Text_Box2_saldo_user Text to
    set Firebase_Database1 Project Bucket to database_user_saldo
    call Firebase_Database1 Store Value
    tag get global nama_user
    value To Store get global saldo_user

when Button2_menu_top_up Click
do
  set global pilih_menu to tampilkan_menu_top_up
```

d. Histori penjualan akun admin

```
when Button1_Top_up Click
do
  call Screen3 Hide Keyboard
  if is empty Text_Box1_nama_user Text
  then
    call Notifier1 Show Message Dialog
    message Mohon pilih salah satu akun pada list di atas.L
    title Akun Tidak Diketahui
    button Text Mengerti
  else
    set global saldo_user to get global saldo_user + Text_Box2_saldo_user Text
    set Text_Box2_saldo_user Text to 0
    set Firebase_Database1 Project Bucket to database_user_saldo
    call Firebase_Database1 Store Value
    tag get global nama_user
    value To Store get global saldo_user

when Button2_menu_top_up Click
do
  set global pilih_menu to tampilan_menu_top_up
```

e. Halaman pembayaran scan QR Code

```
when Button1_scan_barcode Click
do
  call Barcode_Scanner1 Do Scan

else
  call Notifier1 Show Alert
  notice QR Code Tidak Dikenali!!!!
```

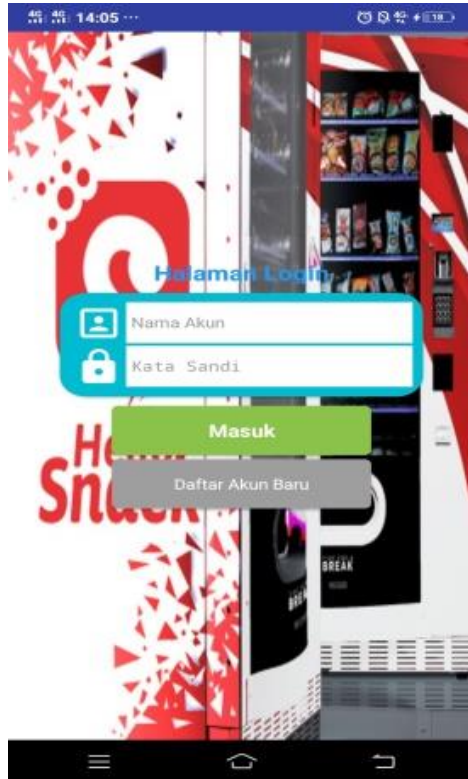
f. Halaman pembayaran button bayar

```
when Button2_bayar Click
do
  if get global pilih_snack = 1
  then
    if get global saldo_user < get global harga_snack1
    then
      set Firebase_Database1 Project Bucket to database_user_saldo
      call Firebase_Database1 Store Value
      tag get global nama_user
      value To Store get global saldo_user - get global harga_snack1
    set Firebase_Database1 Project Bucket to database_alat
    call Firebase_Database1 Store Value
    tag status_transaksi
    value To Store 1
    set Firebase_Database1 Project Bucket to database_penjualan_snack
    call Firebase_Database1 Store Value
    tag
    call Clock1 Format Date Time
    instant call Clock1 Now
    pattern dd-MM-yyyy\hh:mm:ss
    value To Store join get global nama_user
    get global nama_snack1
```



Tampilan Aplikasi Android

a. Tampilan Masuk Akun



b. Tampilan Admin



c. Tampilan scan *QR Code*



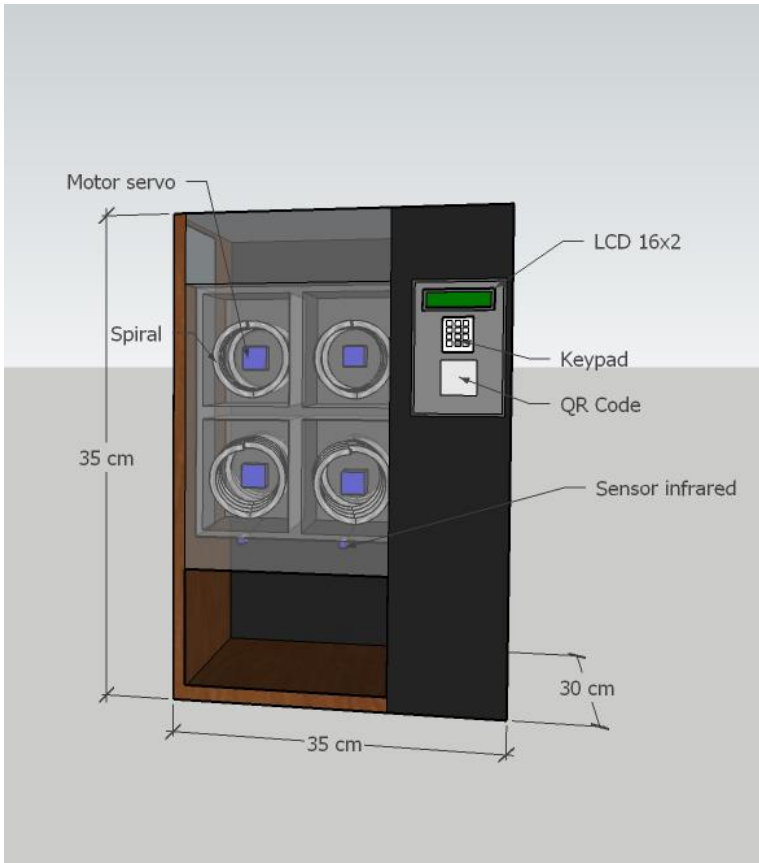
Scan QR Code



d. Tampilan Pembayaran

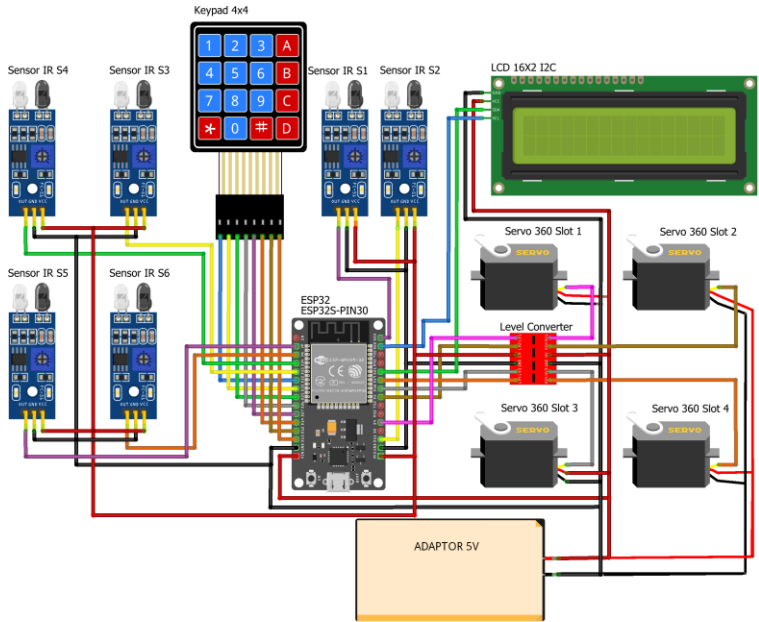


LAMPIRAN C
Gambar Desain Mekanik



LAMPIRAN D

Gambar Rangkaian Sistem



fritzing