CONTEXT
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-Procedures Videos (Contained in Folder of this Project)
-Source Code
-MIT App UI designs & Block Code
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INTRODUCTION

Internet of Things describes the network of physical objects—a.k.a. "things"—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet. The extensive set of applications for IoT devices is often divided into consumer, commercial, industrial, and infrastructure spaces
Wi-Fi is a family of wireless network protocols, based on the IEEE 802.11 family of standards, which are commonly used for local area networking of devices and Internet access, allowing nearby digital devices to exchange data by radio waves.

This project is focused on the use of Wifi to control the extension in turn making it a smart wireless extension that can be controlled anywhere in the world as long as it has Internet connectivity. This wireless extension uses "ROBOTICS CENTER" as SSID and "shut down" as the SSID Password, it was created & developed by Joel Omoroje.
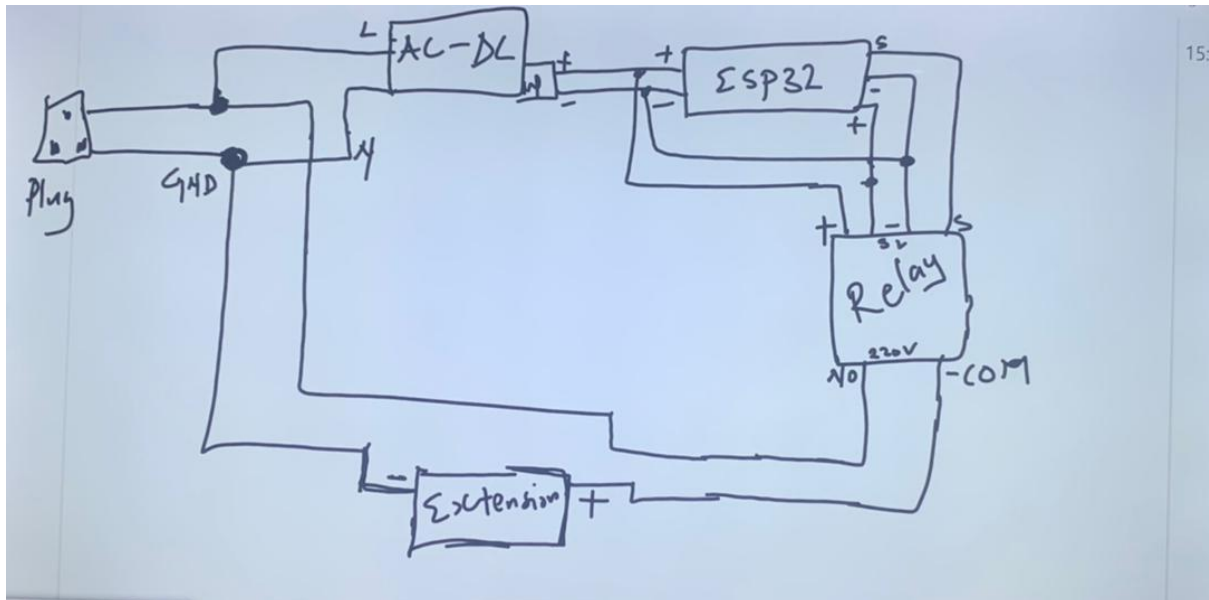
Materials:
- 1 Extension Box
- 1 AC to DC converter (conversion of 220V to 5v)
- 1 Relay
- 1 ESP32

Wireless Materials
-Electricity
-Internet access (wireless)

Connection Layout

Source Code:

```
#include <WiFi.h>
#include <IOXhop_FirebaseESP32.h>

#define FIREBASE_HOST "wifi---esp32-default-rtdb.firebaseio.com"
#define FIREBASE_AUTH "GJPaMgFWnEAHFNANCtCS0sQmDscWdKqpB4mIWX6n"
#define WIFI_SSID "ROBOTICS CENTER"
#define WIFI_PASSWORD "shut down"

void setup() {
  Serial.begin(115200);
       delay(1000);
       WiFi.begin(WIFI_SSID, WIFI_PASSWORD); //try to connect with wifi
       Serial.println("Connecting");
       while (WiFi.status() != WL_CONNECTED) {
       delay(500);
       }
       Serial.println("CONNECTED TO ");
       Serial.println(WIFI_SSID);
       Firebase.begin(FIREBASE_HOST, FIREBASE_AUTH);
       Serial.println("starting Firebase");
       pinMode(19,OUTPUT);
}

void loop() {
```

```
String value  = Firebase.getString("IOT_STATUS");

  // set value
  Firebase.setString("esp32_firebase_status", "connected to firebase successfully");

  // get value
  Serial.print("IOT_STATUS: ");
  Serial.println(Firebase.getString("IOT_STATUS"));


//Validates the Input of IOT_STATUS and switches on the Extension
  if (value == "1"){
        digitalWrite(19,HIGH);
        Firebase.setString("extension", "extension is powered on");
        Serial.println(Firebase.getString("extension"));
        Serial.println("Powered on the extension");
        delay(500);
        }

//Validates the Input of IOT_STATUS and switches off the Extension
        else if (value == "0"){
        digitalWrite(19,LOW);
        Firebase.setString("extension", "update: extension is powered off");
        Serial.println(Firebase.getString("extension"));
        Serial.println("Powered off the extension");
        delay(500);
        }
//Error returned when values are neither 1 or 0
        else{
        Serial.println("ERROR FOUND NEITHER 1 or 0");
        }
}
```
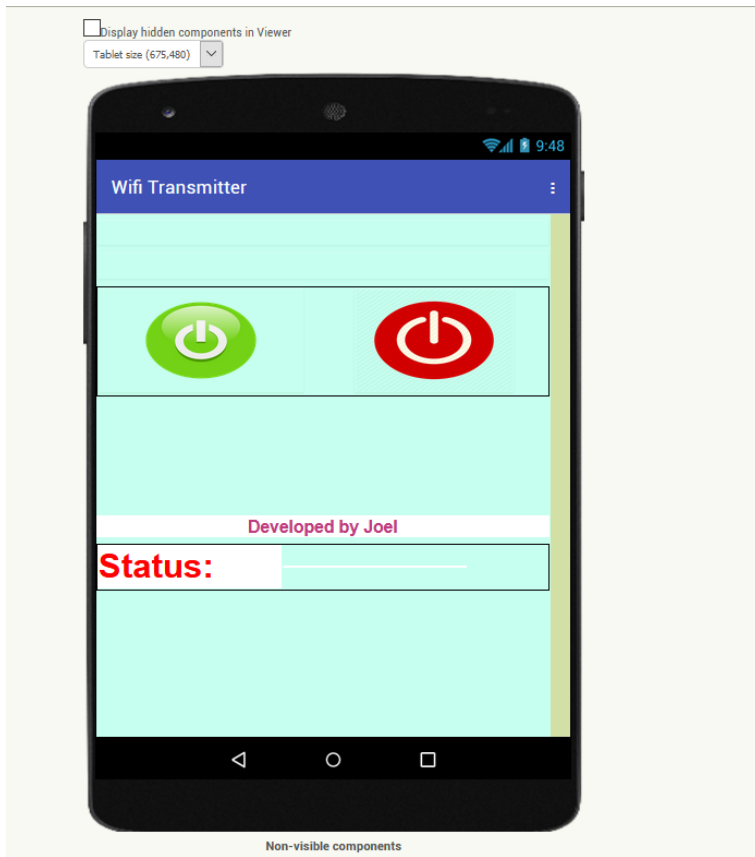
Display hidden components in Viewer

Tablet size (675,480)

Wifi Transmitter

Developed by Joel

Status:

Non-visible components

```
when  ON ▾  .Click
do    call  FirebaseDB1 ▾  .StoreValue
                                    tag  “ IOT_STATUS ”
                            valueToStore  1
      set  status_check ▾ . Text ▾  to  “ Powered On ”
```

```
when  OFF ▾  .Click
do    call  FirebaseDB1 ▾  .StoreValue
                                    tag  “ IOT_STATUS ”
                            valueToStore  0
      set  status_check ▾ . Text ▾  to  “ Powered OFF ”
```

```
when  FirebaseDB1 ▾  .DataChanged
      tag   value
do    call  FirebaseDB1 ▾  .GetValue
                                    tag  1
                        valueIfTagNotThere  “ NO COMMUNICATION ”
```

Firebase Connection
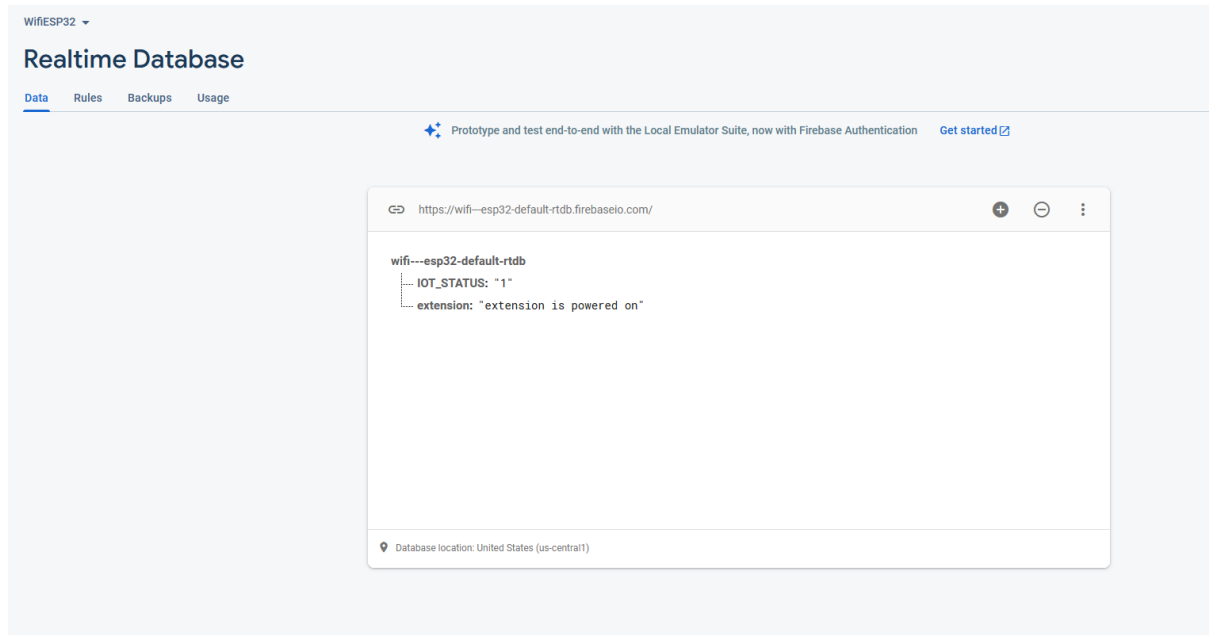
Problems & Solution

While working on this project the problem encountered was installation of the Arduino Json library, i installed the 7.17.3 version which was way above the needed library so in order to have zero issues recreating this project i advise you installed 5.13.5 version of the Arduino JSON.

Also i had the issue of using two different firebase link on the MIT app inventor and the Arduino code, always cross check that and ensure both are using the right linking address.