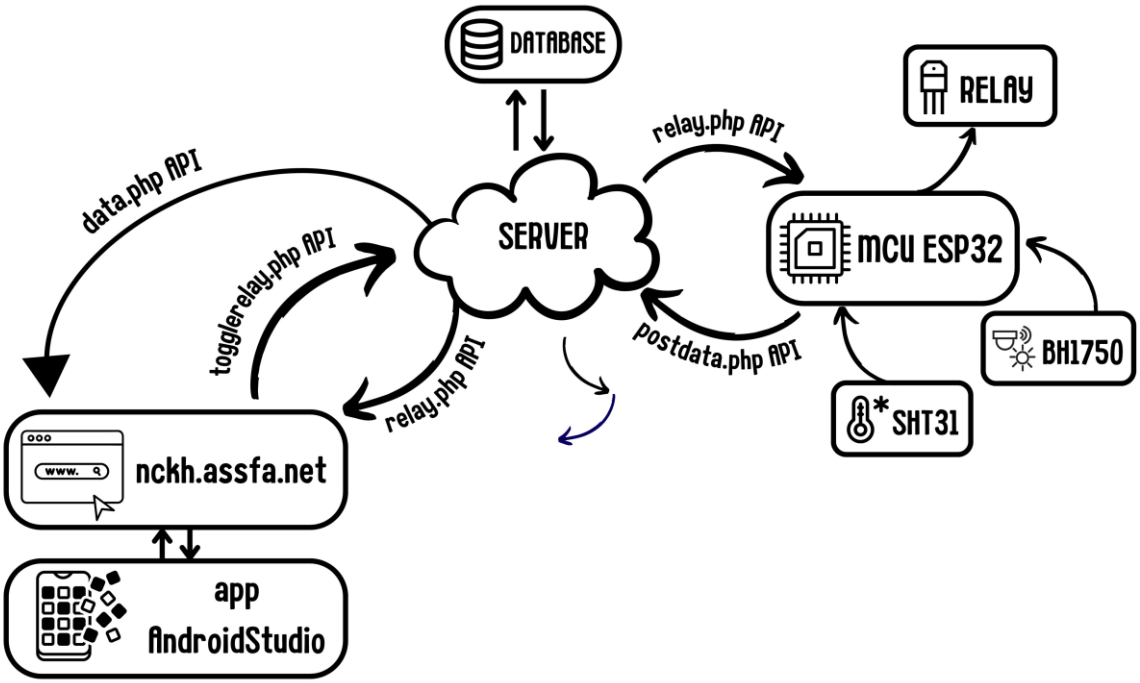
Link drive full code:
https://drive.google.com/drive/folders/1ehQBp0zr8PXoVD1QtNE1D33bRBk7yEHE?usp=sharing

1. Sơ đồ hệ thống



2. Code device

Hardware.h

```
#ifndef __HARDWARE_H__
#define __HARDWARE_H__

#include "esp_log.h"
#include "driver/gpio.h"

#include <i2cdev.h>
#include <sht3x.h>
#include <bh1750.h>

#include <iostream>
using namespace std;

#define BUTTON                  GPIO_NUM_0
#define LED                     GPIO_NUM_23

#define RELAY                   GPIO_NUM_5

#define I2C_SDA_GPIO            GPIO_NUM_19
#define I2C_SCL_GPIO            GPIO_NUM_18

esp_err_t KhoiTaoIO(void);
esp_err_t BatLEDStatus(void);
```

```
esp_err_t TatLEDStatus(void);

#endif // __HARDWARE_H__
```

Hardware.cpp

```
#include "Hardware.h"
static const char *TAG = "Hardware";

esp_err_t KhoiTaoIO(void){
    esp_err_t ret = ESP_OK;

    ESP_LOGI(TAG, "Khởi tạo Led trạng thái");
    ret |= gpio_reset_pin(LED);
    ret |= gpio_set_direction(LED, GPIO_MODE_OUTPUT);

    ESP_LOGI(TAG, "Khởi tạo button");
    ret |= gpio_reset_pin(BUTTON);
    ret |= gpio_set_direction(BUTTON, GPIO_MODE_INPUT);

    ESP_LOGI(TAG, "Khởi tạo relay");
    ret |= gpio_reset_pin(RELAY);
    ret |= gpio_set_direction(RELAY, GPIO_MODE_OUTPUT);
    return ret;
}

esp_err_t BatLEDStatus(void){
    return gpio_set_level(LED, 1);
}

esp_err_t TatLEDStatus(void){
    return gpio_set_level(LED, 0);
}
```

main.cpp

```
#include <stdio.h>
#include "freertos/FreeRTOS.h"
#include "freertos/task.h"
#include "driver/gpio.h"
#include "esp_log.h"
// #include "led_strip.h"
#include "sdkconfig.h"

#include"string.h"
#include <cstring>

#include <iostream>
using namespace std;

static const char *TAG = "main";
#include "Hardware/Hardware.h"

#include "KiemTraInternet.h"
#include "cJSON.h"
#include "POSTGET.h"
```

```
extern "C"{
   void app_main(void);
}

char _IMEI[13];
void GetChipID(){
   uint8_t MAC[6];
   esp_read_mac(MAC, ESP_MAC_WIFI_STA);
   for (uint8_t i = 0; i < 6; i++){
      static int index = 0;
      index += snprintf(&_IMEI[index], 20 - index, "%02X", MAC[i]);
   }
   // Cập nhật SSID cho WiFi AP
   snprintf((char *)wifi_settings.ap_ssid, MAX_SSID_SIZE, "%s_%s", DEFAULT_AP_SSID,
_IMEI);
   ESP_LOGI(TAG, "MAC: %s",_IMEI);
}

uint8_t duration;
sht3x_t sht31_dev;
float _NhietDo, _DoAm;

void vTaskDocCamBienSHT31(void *pvParameters){
   memset(&sht31_dev, 0, sizeof(sht3x_t));
   sht3x_init_desc(&sht31_dev, 0, 0x44, I2C_SDA_GPIO, I2C_SCL_GPIO);
   sht3x_init(&sht31_dev);
   duration = sht3x_get_measurement_duration(SHT3X_HIGH);

   while(1){
      sht3x_start_measurement(&sht31_dev, SHT3X_SINGLE_SHOT, SHT3X_HIGH);
      vTaskDelay(duration);
      sht3x_get_results(&sht31_dev, &_NhietDo, &_DoAm);
      ESP_LOGI(TAG, "Cảm biến SHT31: %.2f°C, %.2f%%", _NhietDo, _DoAm);
      vTaskDelay(pdMS_TO_TICKS(1000));
   }
   vTaskDelete(NULL);
}

i2c_dev_t BH1750_Dev;
uint16_t Lux_Data;

void vTaskDocCamBienBH1750(void *pvParameters){
   bh1750_init_desc(&BH1750_Dev, BH1750_ADDR_LOW, 0, I2C_SDA_GPIO,
I2C_SCL_GPIO);
   bh1750_setup(&BH1750_Dev, BH1750_MODE_CONTINUOUS, BH1750_RES_HIGH);

   while(1){
      if (bh1750_read(&BH1750_Dev, &Lux_Data) != ESP_OK)
         ESP_LOGE(TAG, "Could not read lux data");
      else
         ESP_LOGW(TAG, "Cảm biến BH1750: %dlx", Lux_Data);

      vTaskDelay(pdMS_TO_TICKS(1000));
   }
```

```
    vTaskDelete(NULL);
}

char http_response_post[MAX_HTTP_OUTPUT_BUFFER];
void PostData(){
    char url_request[256];
    snprintf(url_request, 256,

"http://nckh.assfa.net/postdata.php?ThietBi=%s&NhietDo=%.2f&DoAm=%.2f&AnhSang=%d&C
O2=480&Mua=1&ThoiTiet=1",_IMEI, _NhietDo, _DoAm, Lux_Data);
    cout << url_request << endl;
    HTTP_CODE_e http_code = http_get(url_request, http_response_post);
    if(http_code == HTTP_OK){
        ESP_LOGW(TAG, "Post Data OK");
    }
}

char http_response[MAX_HTTP_OUTPUT_BUFFER];
char http_response_cut[MAX_HTTP_OUTPUT_BUFFER];

int TrangThaiRelay;

void GetData(){
    HTTP_CODE_e http_code = http_get("http://nckh.assfa.net/relay.php", http_response);

    if(http_code == HTTP_OK){
        cout << http_response << endl;
        TrangThaiRelay = http_response[11] - 48;
        cout << "TrangThaiRelay: " << TrangThaiRelay << endl;
        gpio_set_level(RELAY, TrangThaiRelay);
    }
}

void vTaskGetData(void *pvParameters){
    while(1){
        if(KiemTraInternet() == CONNECTION_INTERNET_OK){
            GetData();
        }
        vTaskDelay(pdMS_TO_TICKS(100));
    }
    vTaskDelete(NULL);
}

void vTaskPostData(void *pvParameters){
    while(1){
        if(KiemTraInternet() == CONNECTION_INTERNET_OK){
            PostData();
        }
        vTaskDelay(pdMS_TO_TICKS(2000));
    }
    vTaskDelete(NULL);
}

void app_main(void){
    ESP_ERROR_CHECK(i2cdev_init());
```

```
    KhoiTaoIO();

    GetChipID();
    /* start the wifi manager */
          wifi_manager_start();
          wifi_manager_set_callback(WM_EVENT_STA_GOT_IP, &CheckIP);


    xTaskCreatePinnedToCore(vTaskDocCamBienSHT31, "vTaskDocCamBienSHT31", 4096,
NULL, 1, NULL, 0);
    xTaskCreatePinnedToCore(vTaskDocCamBienBH1750, "vTaskDocCamBienBH1750", 4096,
NULL, 1, NULL, 0);

    xTaskCreatePinnedToCore(vTaskGetData, "vTaskGetData", 4096, NULL, 1, NULL, 1);
    xTaskCreatePinnedToCore(vTaskPostData, "vTaskPostData", 4096, NULL, 1, NULL, 1);


    while (1) {
       if(KiemTraInternet() == CONNECTION_INTERNET_OK){
          TatLEDStatus();
       }
       else{
          BatLEDStatus();
       }
       vTaskDelay(pdMS_TO_TICKS(1000));

    }
}
```

3. Code web

connectdb.php

```
<?php
          $sever = "localhost";
          $user = "wseometc_admin";
          $pass = "Lytranquocuy@123";
          $db = "wseometc_nckh";

          $conn = new mysqli($sever, $user, $pass, $db);

          if (!$conn) {
                    die("Ket noi db khong thanh cong!" . $conn->connect_error);
          }
          $conn->query("set names 'utf8'");
?>
```

postdata.php

```
<?php
          require('connectdb.php');
          $ThietBi = $_GET["ThietBi"];
          $NhietDo = $_GET["NhietDo"];
          $DoAm = $_GET["DoAm"];
          $AnhSang = $_GET["AnhSang"];
          $CO2 = $_GET["CO2"];
          $Mua = $_GET["Mua"];
```

```
        $ThoiTiet = $_GET["ThoiTiet"];

        date_default_timezone_set('Asia/Ho_Chi_Minh');
        $time_act = date('Y-m-d H:i:s'); // use actual date() format displayed in your table.

        $sql = "INSERT INTO DataIoTProject (ThietBi, NhietDo, DoAm, AnhSang, CO2, Mua,
ThoiTiet, ThoiGian)
        VALUES ('" . $ThietBi . "','" . $NhietDo . "', '" . $DoAm . "' , '" . $AnhSang . "' , '" . $CO2 .
"' , '" . $Mua . "', '" . $ThoiTiet . "', '" . $time_act . "')";
        $conn->query($sql);

        $conn->close();
?>
```

data.php

```
<?php
        require('connectdb.php');
        $sql = "SELECT * FROM `DataIoTProject` ORDER BY STT DESC LIMIT 1";
        if ($result = $conn->query($sql)) {
                while ($row = $result->fetch_assoc()) {

                        $ThietBi = $row["ThietBi"];
                        $NhietDo = $row["NhietDo"];
                        $DoAm = $row["DoAm"];
                        $AnhSang = $row["AnhSang"];
                        $CO2 = $row["CO2"];
                        $Mua = $row["Mua"];
                        $ThoiTiet = $row["ThoiTiet"];
                        $ThoiGian = $row["ThoiGian"];

                        echo '[{"ThietBi":"' . $ThietBi . '","NhietDo":' . $NhietDo . ',"DoAm":' .
$DoAm . ',"AnhSang":' . $AnhSang . ',"CO2":' . $CO2 . ',"Mua":' . $Mua . ', "ThoiTiet":' .
$ThoiTiet . ',"ThoiGian":"' . $ThoiGian . '"}]';
                }
                $result->free();
        }
        $conn->close();
?>
```

relay.php

```
<?php
        require('connectdb.php');
        $sql = "SELECT * FROM `DataModeIoTProject` WHERE 1";
        if ($result = $conn->query($sql)) {
                while ($row = $result->fetch_assoc()) {
        $Relay = $row["K1"];
        echo '[{"Relay1":' . $Relay . '}]';
                }
                $result->free();
        }
        $conn->close();
?>
```

togglerelay.php

```
<?php
        require('connectdb.php');
        $sql = "SELECT * FROM `DataModeIoTProject` WHERE 1";
        if ($result = $conn->query($sql)) {
                while ($row = $result->fetch_assoc()) {
        $Relay = $row["K1"];
        echo '[{"Relay1":' . $Relay . '}]';

                        $Relay = 1 - $Relay;
                        $sql1 = "UPDATE `DataModeIoTProject` SET `K1`=" . $Relay . "
WHERE 1";
                        echo $sql1;
                        $conn->query($sql1);
                }
                $result->free();
        }
        $conn->close();
?>
```

index.php

```
<!DOCTYPE html>
<html>
   <head>
      <meta http-equiv="content-type" content="text/html; charset=UTF-8" />
      <meta name="format-detection" content="telephone=no">
      <meta name="msapplication-tap-highlight" content="no">
      <meta name="viewport" content="user-scalable=no, initial-scale=1, maximum-scale=1,
minimum-scale=1, width=device-width">
      <title>IoTProject</title>
      <script type="text/javascript"
src="https://cdnjs.cloudflare.com/ajax/libs/jquery/3.1.1/jquery.js"></script>

      <script src="https://code.highcharts.com/highcharts.js"></script>
      <script src="https://code.highcharts.com/modules/exporting.js"></script>
      <script src="https://code.highcharts.com/modules/export-data.js"></script>
      <script src="https://code.highcharts.com/modules/accessibility.js"></script>

      <link rel="stylesheet" href="css/jquery.mobile-1.4.2.min.css" />
      <script src="js/jquery.js"></script>
      <script src="js/jquery.mobile-1.4.2.min.js"></script>
      <!-- <link rel="stylesheet" href="css/index.css"> -->

      <style>
         .highcharts-figure,
         .highcharts-data-table table {
         min-width: 320px;
         max-width: 800px;
         margin: 1em auto;
         }
         #container {
            height: 400px;
            background-color: transparent;
         }
```

```
.highcharts-data-table table {
font-family: Verdana, sans-serif;
border-collapse: collapse;
border: 1px solid #ebebeb;
margin: 10px auto;
text-align: center;
width: 100%;
max-width: 500px;
}

.highcharts-data-table caption {
padding: 1em 0;
font-size: 1.2em;
color: #555;
}

.highcharts-data-table th {
   font-weight: 600;
   padding: 0.5em;
}

.highcharts-data-table td,
.highcharts-data-table th,
.highcharts-data-table caption {
   padding: 0.5em;
}

.highcharts-data-table thead tr,
.highcharts-data-table tr:nth-child(even) {
   background: #f8f8f8;
}

.highcharts-data-table tr:hover {
   background: #f1f7ff;
}

.button {
   display: inline-block;
   padding: 15px 25px;
   font-size: 24px;
   cursor: pointer;
   text-align: center;
   text-decoration: none;
   outline: none;
   color: #fff;
   background-color: #4CAF50;
   border: none;
   border-radius: 15px;
   box-shadow: 0 9px #999;
}

.button:hover {background-color: #3e8e41}

.button:active {
   background-color: #3e8e41;
```

```
            box-shadow: 0 5px #666;
            transform: translateY(4px);
        }

        #backgroundimage
        {
            height: 100%;
            left: 0;
            margin: 0;
            padding: 0;
            position: fixed;
            top: 0;
            width: 100%;
            z-index: -1;
        }
        #mainpage
        {
            background-image: url('/img/bg.png');
            background-size: 100vw 60vh;
            background-repeat: no-repeat;

            background-color: #e7f1fd
        }

        #PageHeader
        {
            background-color: transparent;
            border: 0;
        }

        table, th, td {
            border:0px solid black;
            border-spacing: 10px;
        }

        #TableChart
        {
            border-spacing: 0px;
        }

    </style>

</head>
<body align="center">
    <script src="js/index.js"></script>
    <!-- Khóa chức năng viewsource -->
    <script>
        document.addEventListener('contextmenu', event => event.preventDefault());
        document.addEventListener('keydown', function (event){
            if (event.ctrlKey){
                event.preventDefault();
            }
            if(event.keyCode == 123){
                event.preventDefault();
            }
```

```
        });

        node.addEventListener('contextmenu', function(e){
           e.preventDefault();
        });
      </script>
      <!-- Khóa chức năng viewsource -->

      <div id = "mainpage" data-role='page' style='display: inherit'>
        <div id = "PageHeader" data-role='header' style="color:white; width:100%; text-align:
center">
        <!-- <h1 style="color:white; font-size: 20px;">IoT Project</h1>     -->
        <h3 id="TenThietBi" style="color:white;">Thiết Bị</h3>
        </div>

        <div data-role="content">
          <table style="width:100%">
            <tr >
              <th style="background:white; border-radius: 20px; width:33%; height: 150px;box-
shadow: 0px 8px 15px rgba(0, 0, 0, 0.1);">
                <div style="width:100%; height: 100%;">

                  <div style="width:100%; height: 15px;"></div>
                  <div style="width:100%; height: 20px; font-size: 15px;">
                    Nhiệt Độ
                  </div>

                  <div style="width:100%; height: 50px; text-align:center;">
                    <img src="/img/nhietdo.png" width="50px" height="50px">
                  </div>

                  <div style="width:100%; height: 5px;"></div>
                  <div id="GiaTriNhietDo" style="width:100%; height: 20px; font-size:
18px;">0</div>
                  <div style="width:100%; height: 5px;"></div>
                  <div style="width:100%; height: 20px;">(°C)</div>

                </div>

              </th>
              <th style="background:white; border-radius: 20px; width:33%; height: 150px;box-
shadow: 0px 8px 15px rgba(0, 0, 0, 0.1);">

                <div style="width:100%; height: 100%;">

                  <div style="width:100%; height: 15px;"></div>
                  <div style="width:100%; height: 20px; font-size: 15px;">
                    Độ Ẩm
                  </div>

                  <div style="width:100%; height: 50px; text-align:center;">
                    <img src="/img/doam.png" width="50px" height="50px">
                  </div>

                  <div style="width:100%; height: 5px;"></div>
```

```
                    <div id="GiaTriDoAm" style="width:100%; height: 20px; font-size:
18px;">0</div>
                    <div style="width:100%; height: 5px;"></div>
                    <div style="width:100%; height: 20px;">(%)</div>

                </div>

            </th>
            <th style="background:white; border-radius: 20px; width:33%; height: 150px;box-
shadow: 0px 8px 15px rgba(0, 0, 0, 0.1);">

            <div style="width:100%; height: 100%;">

                <div style="width:100%; height: 15px;"></div>
                <div style="width:100%; height: 20px; font-size: 15px;">
                  Ánh Sáng
                </div>

                <div style="width:100%; height: 50px; text-align:center;">
                  <img src="/img/anhsang.png" width="50px" height="50px">
                </div>

                <div style="width:100%; height: 5px;"></div>
                <div id="GiaTriAnhSang" style="width:100%; height: 20px; font-size:
18px;">0</div>
                <div style="width:100%; height: 5px;"></div>
                <div style="width:100%; height: 20px;">(lx)</div>

              </div>
            </th>
          </tr>
        </table>

        <div style="background:white; border-radius: 20px; width:100%; height: 260px;">
          <div style="width:95%; height: 10px; margin-left: auto; margin-right: auto;"> </div>
          <div id="Chart1" style="background:black; width:95%; height: 240px; margin-left:
auto; margin-right: auto; "> </div>
          <!-- <div id="Chart1" style="width:90%; height: 240px; position: absolute; top: 56%;
left: 50%; transform: translate(-50%, -50%); "></div> -->
        </div>

        <br>

        <div style="background:white; border-radius: 30px;  width=100%; box-shadow: 0px 8px
15px rgba(0, 0, 0, 0.1)">
          <img id="ButtonRelay1" src="/img/IMGBtnOn.png" onclick="ToggleRelay()"
width="100" height="100">
        </div>
      </div>
      <div data-role='footer' class='ui-footer ui-footer-fixed'>
      </div>
    </div>

    <script>
      Highcharts.chart('Chart1', {
```

```
            chart: {
                // height: 240,
                type: 'spline',
                animation: Highcharts.svg, // don't animate in old IE
                marginRight: 10,
                events: {
                    load: function () {
                        // set up the updating of the chart each second
                        var seriesNhietDo = this.series[0];
                        var seriesDoAm = this.series[1];
                        var seriesAnhSang = this.series[2];

                        var lastx;
                        setInterval(function () {
                            var url = 'data.php';
                            $.getJSON(url).done(function(data) {
                                $.each(data, function (index, json) {
                                    var thietbi = json.ThietBi;
                                    $("#TenThietBi").html("IMEI: " + thietbi);

                                    var giatrithoigian = json.ThoiGian;
                                    var date = new Date(giatrithoigian);
                                    var x = date.getTime();

                                    var giatrinhietdo = parseFloat(json.NhietDo);
                                    $("#GiaTriNhietDo").html(giatrinhietdo);
                                    var giatridoam  = parseFloat(json.DoAm);
                                    $("#GiaTriDoAm").html(giatridoam);
                                    var giatrianhsang = parseFloat(json.AnhSang);
                                    $("#GiaTriAnhSang").html(giatrianhsang);
                                    console.log(giatrithoigian);
                                    console.log(x);
                                    console.log(giatrinhietdo);
                                    console.log(giatridoam);
                                    console.log(giatrianhsang);

                                    if(x != lastx){
                                        seriesNhietDo.addPoint([x, giatrinhietdo], true, true);
                                        seriesDoAm.addPoint([x, giatridoam], true, true);
                                        seriesAnhSang.addPoint([x, giatrianhsang], true, true);
                                        lastx = x;
                                    }
                                });
                            });

                            $.getJSON('relay.php').done(function(data) {
                                $.each(data, function (index, json) {
                                    var relay = parseInt(json.Relay1);
                                    if(relay == 1){
                                        console.log("ON");
                                        // $("#ButtonRelay1").html("ON");
                                        document.getElementById('ButtonRelay1').src = '/img/IMGBtnOn.png';
                                    }
                                    else if(relay == 0){
                                        console.log("OFF");
```

```
                                // $("#ButtonRelay1").html("OFF");
                                document.getElementById('ButtonRelay1').src =
'/img/IMGBtnOff.png';
                            }
                        });
                    });

                }, 1000);
            }
        }
    },
    time: {
        useUTC: false
    },
    title: {
        text: ''
    },
    accessibility: {
        announceNewData: {
            enabled: true,
            minAnnounceInterval: 15000,
            announcementFormatter: function (allSeries, newSeries, newPoint) {
                if (newPoint) {
                    return 'New point added. Value: ' + newPoint.y;
                }
                return false;
            }
        }
    },

    xAxis: {
        type: 'datetime',
        tickPixelInterval: 40
    },

    yAxis: {
        title: {
            text: ''
        }
    },

    plotOptions: {
        line: {
            dataLabels: {
                enabled: false
            },
            enableMouseTracking: true
        }
    },

    tooltip: {
        fontSize: '14px',
        xDateFormat: 'Ngày: %d/%m/%Y <br> Thời gian: %H:%M:%S',
        shared: true
    },
```

```
//Enable label
legend: {
    enabled: true,
    itemStyle: {
        fontSize:'10px',
        // font: '20pt Trebuchet MS, Verdana, sans-serif',
        // color: '#A0A0A0'
    }
},
//Tắt dấu =
exporting: {
    enabled: false
},

series: [{
    name: 'Nhiệt Độ(°C)',
    data: (function () {
    // generate an array of random data
        var data = [], time = (new Date()).getTime(), i;
        for (i = -19; i <= 0; i += 1) {
            data.push({
                x: time + i * 1000,
                y: 0
            });
        }
        return data;
    }())
},{
    name: 'Độ Ẩm(%)',
    data: (function () {
    // generate an array of random data
        var data = [], time = (new Date()).getTime(), i;
        for (i = -19; i <= 0; i += 1) {
            data.push({
                x: time + i * 1000,
                y: 0
            });
        }
        return data;
    }())
},{
    name: 'Ánh Sáng(lx)',
    data: (function () {
    // generate an array of random data
        var data = [], time = (new Date()).getTime(), i;
        for (i = -19; i <= 0; i += 1) {
            data.push({
                x: time + i * 1000,
                y: 0
            });
        }
        return data;
    }())
}]
```

```
        });
    </script>
  </body>
</html>
```

index.js

```
function ToggleRelay(){
  $.ajax({
    url: "toggleRelay.php",
    contentType: "application/json; charset=utf-8",
    type: "GET",
    complete: function () {
      console.log("Toggle OK");
      $.getJSON('relay.php').done(function(data) {
        $.each(data, function (index, json) {
          var relay = parseInt(json.Relay1);
          if(relay == 1){
            console.log("ON");
            document.getElementById('ButtonRelay1').src = '/img/IMGBtnOn.png';
          }
          else if(relay == 0){
            console.log("OFF");
            document.getElementById('ButtonRelay1').src = '/img/IMGBtnOff.png';
          }
        });
      });
    },
    error: function (){
      console.log("Toggle Error");
    }
  });
}
```

4. Code app Android Studio

```
package com.example.iotproject.ui.home;

import static java.lang.Thread.sleep;

import android.content.Context;
import android.net.ConnectivityManager;
import android.net.NetworkInfo;
import android.net.http.SslError;
import android.os.Bundle;
import android.os.Handler;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.webkit.SslErrorHandler;
import android.webkit.WebResourceError;
import android.webkit.WebResourceRequest;
import android.webkit.WebView;
import android.webkit.WebViewClient;

import androidx.annotation.NonNull;
```

```
import androidx.fragment.app.Fragment;
import androidx.lifecycle.ViewModelProvider;

import android.graphics.Bitmap;
import android.widget.ImageView;
import android.widget.TextView;


import com.bumptech.glide.Glide;
import com.example.iotproject.databinding.FragmentHomeBinding;

import java.util.Timer;
import java.util.TimerTask;


public class HomeFragment extends Fragment {
  private FragmentHomeBinding binding;

  String ShowOrHideWebViewInitialUse = "show";
  public WebView webView;

  private ImageView Icon;
  private ImageView Logo;
  private ImageView GifView;
  private TextView WarningText;

  boolean LoadError = false;

  public View onCreateView(@NonNull LayoutInflater inflater,
                           ViewGroup container, Bundle savedInstanceState) {
    HomeViewModel homeViewModel =
          new ViewModelProvider(this).get(HomeViewModel.class);
    binding = FragmentHomeBinding.inflate(inflater, container, false);
    View root = binding.getRoot();

    webView = binding.webView;
    Icon = binding.imageView2;
    Logo = binding.imageView3;
    GifView = binding.loadinggif;
    WarningText = binding.warning;

    Logo.setVisibility(View.GONE);

    Glide.with(this).load("file:///android_asset/LoadingGif3.gif").into(binding.loadinggif);

    Timer timer = new Timer();
    timer.schedule(new TimerTask()
    {
      @Override
      public void run() {
      ConnectivityManager connectivityManager = (ConnectivityManager)
getActivity().getSystemService(Context.CONNECTIVITY_SERVICE);
      NetworkInfo wifi = connectivityManager.getNetworkInfo(ConnectivityManager.TYPE_WIFI);
      NetworkInfo mobileNetwork =
connectivityManager.getNetworkInfo(ConnectivityManager.TYPE_MOBILE);

      if(wifi.isConnected() || mobileNetwork.isConnected()){
        getActivity().runOnUiThread(()->{
          WarningText.setVisibility(View.GONE);
```

```
                if(LoadError){
  //                webView.reload();
                    LoadError = false;
                }
            });
        }
        else{
            getActivity().runOnUiThread(()->{
                WarningText.setVisibility(View.VISIBLE);
            });
        }
        }
    }, 0, 500);

    checkConnection();
    return root;
  }
  public void loadWebView(){
    webView.setVisibility(View.INVISIBLE);
    webView.setWebViewClient(new CustomWebViewClient());
    webView.getSettings().setJavaScriptEnabled(true);
    webView.getSettings().setDomStorageEnabled(true);

    webView.loadUrl("https://nckh.assfa.net");
    //webView.loadUrl("https://nckh.assfa.net/testchart/");
  }

  public void checkConnection(){
    ConnectivityManager connectivityManager = (ConnectivityManager)
          getActivity().getSystemService(Context.CONNECTIVITY_SERVICE);
    NetworkInfo wifi = connectivityManager.getNetworkInfo(ConnectivityManager.TYPE_WIFI);
    NetworkInfo mobileNetwork =
connectivityManager.getNetworkInfo(ConnectivityManager.TYPE_MOBILE);

    if(wifi.isConnected()){
      loadWebView();
    }
    else if (mobileNetwork.isConnected()){
      loadWebView();
    }
    else{
      webView.setVisibility(View.GONE);
      GifView.setVisibility(View.GONE);
      WarningText.setVisibility(View.VISIBLE);
    }
  }

  // This allows for a splash screen
  // (and hide elements once the page loads)
  private class CustomWebViewClient extends WebViewClient implements
com.example.iotproject.ui.home.CustomWebViewClient {
    @Override
    public void onPageStarted(WebView webview, String url, Bitmap favicon) {
      WarningText.setVisibility(View.GONE);
      webview.setVisibility(View.INVISIBLE);
    }
    @Override
    public void onPageFinished(WebView view, String url) {
      WarningText.setVisibility(View.GONE);
```

```
        Handler handler = new Handler();
        handler.postDelayed(new Runnable() {
            @Override
            public void run() {
                //do after delay
                Icon.setVisibility(View.GONE);
                Logo.setVisibility(View.GONE);
                GifView.setVisibility(View.GONE);
//                  WarningText.setVisibility(View.VISIBLE);
                view.setVisibility(View.VISIBLE);
            }
        }, 500);

        super.onPageFinished(view, url);
    }

    @Override
    public void onReceivedSslError(WebView view, SslErrorHandler handler, SslError error) {
        handler.proceed();
    }

    @Override
    public void onReceivedError(WebView view, WebResourceRequest request, WebResourceError error){
        WarningText.setVisibility(View.VISIBLE);
        LoadError = true;
    }
  }

  @Override
  public void onDestroyView() {
    super.onDestroyView();
    binding = null;
  }
}
```