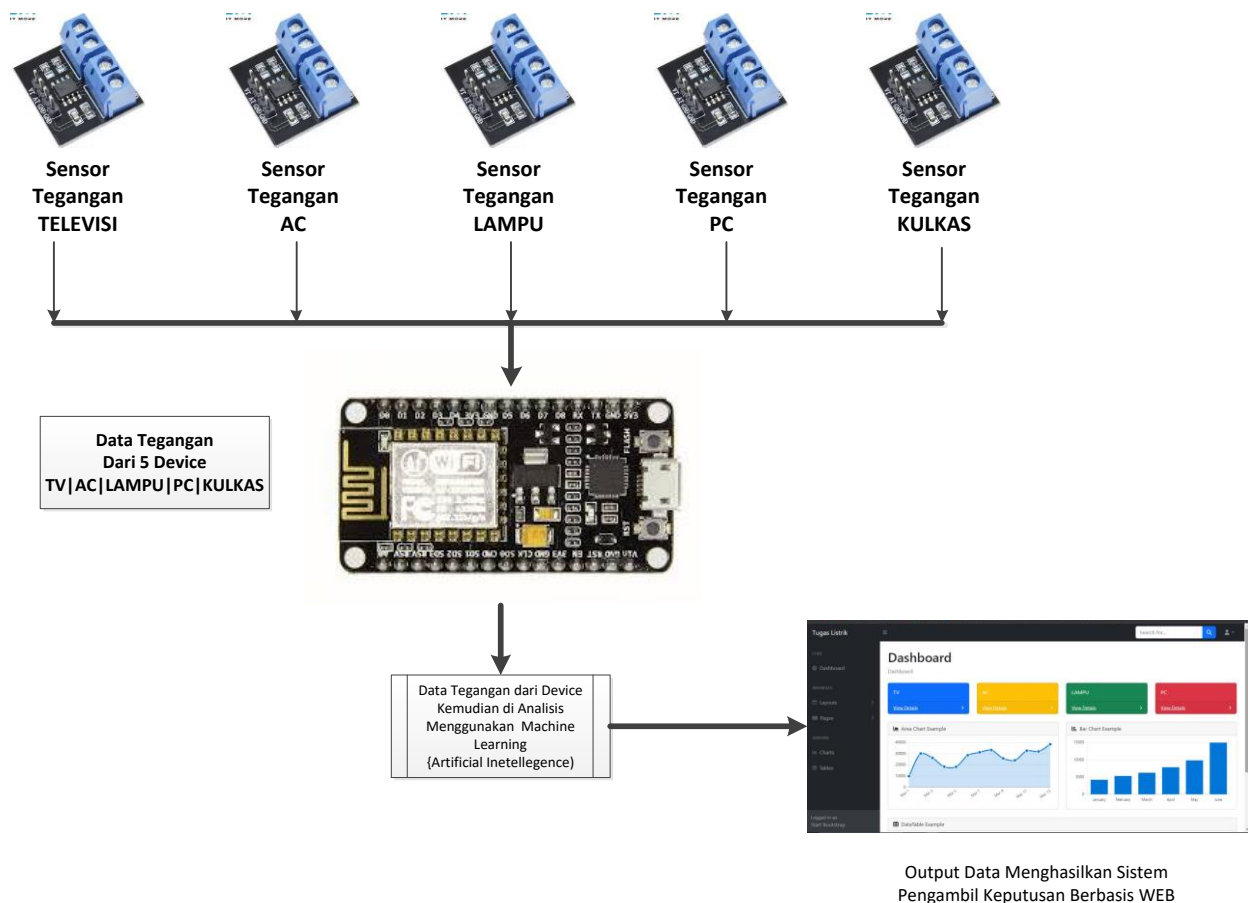


# Technical Test AI & IoT Mentor #SIC

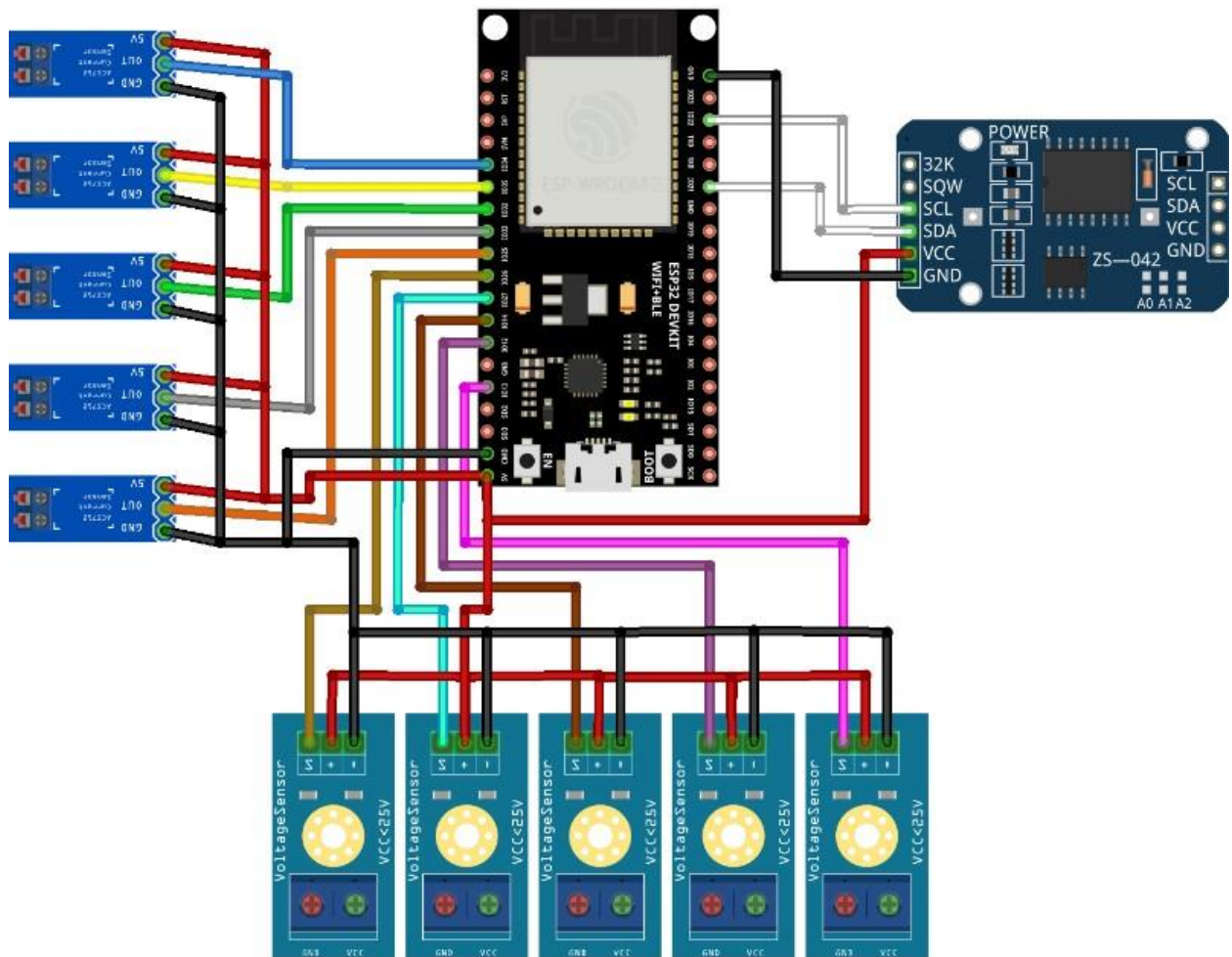
## Step by Step Progress

1. Membuat program mikrokontroler ESP32 terdiri dari untuk mendeteksi sensor tegangan dan arus dengan delay waktu tertentu pada beberapa perangkat seperti TV, AC, Lampu, PC dan Kulkas. Output dari tugas ini adalah data Tegangan dan Arus (Daya) dari masing-masing perangkat yang di monitoring dengan waktu delay yang telah ditentukan (missal pengiriman data setiap 5 menit).

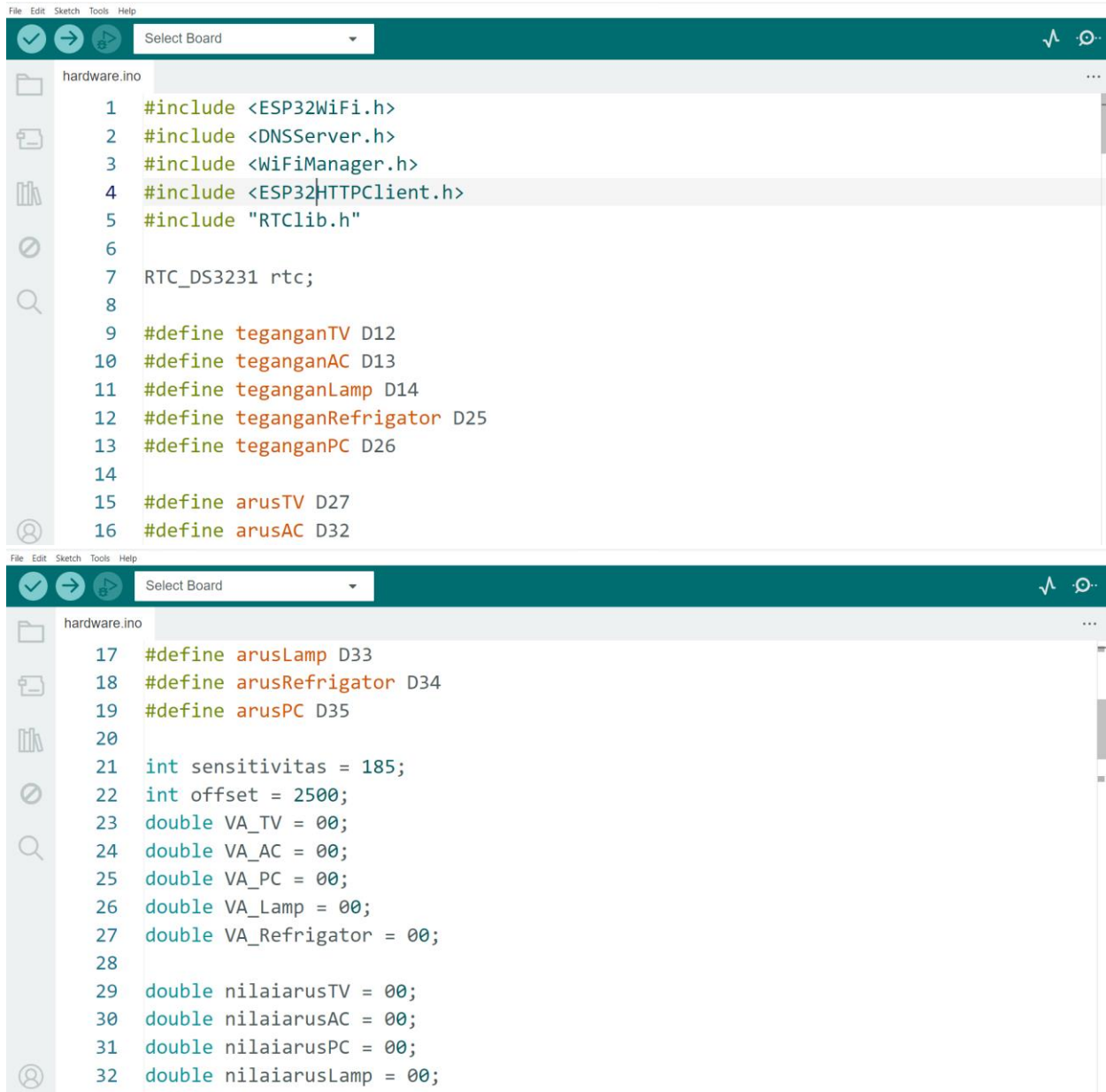
## RANCANGAN DESAIN SYSTEM



## RANCANGAN RANGKAIAN EMBEDDED SYSTEM



## SCREENSHOOT PROGRAM NODE MCU ESP 32



```
File Edit Sketch Tools Help
[Icons] Select Board [Icons]
```

hardware.ino

```
1  #include <ESP32WiFi.h>
2  #include <DNSServer.h>
3  #include <WiFiManager.h>
4  #include <ESP32HTTPClient.h>
5  #include "RTClib.h"
6
7  RTC_DS3231 rtc;
8
9  #define teganganTV D12
10 #define teganganAC D13
11 #define teganganLamp D14
12 #define teganganRefrigator D25
13 #define teganganPC D26
14
15 #define arusTV D27
16 #define arusAC D32
```

```
File Edit Sketch Tools Help
[Icons] Select Board [Icons]
```

hardware.ino

```
17 #define arusLamp D33
18 #define arusRefrigator D34
19 #define arusPC D35
20
21 int sensitivitas = 185;
22 int offset = 2500;
23 double VA_TV = 00;
24 double VA_AC = 00;
25 double VA_PC = 00;
26 double VA_Lamp = 00;
27 double VA_Refrigator = 00;
28
29 double nilaiarusTV = 00;
30 double nilaiarusAC = 00;
31 double nilaiarusPC = 00;
32 double nilaiarusLamp = 00;
```

```
File Edit Sketch Tools Help
Select Board

hardware.ino
31 double nilaiArusPC = 00;
32 double nilaiArusLamp = 00;
33
34 double nilaiArusRefrigator = 00;
35
36 void setup() {
37   // put your setup code here, to run once:
38   Serial.begin(9600);
39   WiFiManager wifiManager;
40   wifiManager.autoConnect("Tugas LISTRIK");
41   while (WiFi.status() != WL_CONNECTED) {
42     lcd.setCursor(0, 0);
43     lcd.print("Menghubungkan...");
44     for (int c = 0; c < 3; c++) {
45       Serial.print(" ");
46       delay(1000);
47     }
48   }
49   if (!rtc.begin()) {
50     Serial.println("Couldn't find RTC");
51     Serial.flush();
52
53     while (1) delay(10);
54   }
55   // rtc.adjust(DateTime(F(__DATE__), F(__TIME__)));
56   // rtc.adjust(DateTime(2014, 1, 21, 3, 0, 0));
57
58   void loop() {
59     // put your main code here, to run repeatedly:
60     DateTime now = rtc.now();
61     int bacaTeganganTV = analogRead(teganganTV);
62     int bacaTeganganAC = analogRead(teganganAC);
63     int bacaTeganganPC = analogRead(teganganPC);
64     int bacaTeganganLamp = analogRead(teganganLamp);
65     int bacaTeganganRefrigator = analogRead(teganganRefrigator);
66
67     int bacaArusTV = analogRead(arusTV);
68     int bacaArusAC = analogRead(arusAC);
69     int bacaArusPC = analogRead(arusPC);
70     int bacaArusLamp = analogRead(arusLamp);
71     int bacaArusRefrigator = analogRead(arusRefrigator);
72
Ln 33, Col 1 X No board selected
```

```
File Edit Sketch Tools Help
[Icons] Select Board [Icons]

hardware.ino
71 int bacaArusRefrigator = analogRead(arusRefrigator);
72
73 nilaiTeganganTV = bacaTeganganTV * (5.0 / 1023.0);
74 nilaiTeganganAC = bacaTeganganAC * (5.0 / 1023.0);
75 nilaiTeganganPC = bacaTeganganPC * (5.0 / 1023.0);
76 nilaiTeganganLamp = bacaTeganganLamp * (5.0 / 1023.0);
77 nilaiTeganganRefrigator = bacaTeganganRefrigator * (5.0 / 1023.0);
78
79 VA_TV = (bacaArusTV / 1024.0) * 5000;
80 VA_AC = (bacaArusAC / 1024.0) * 5000;
81 VA_PC = (bacaArusPC / 1024.0) * 5000;
82 VA_Lamp = (bacaArusLamp / 1024.0) * 5000;
83 VA_Refrigator = (bacaArusRefrigator / 1024.0) * 5000;
84
85 nilaiarusTV = ((VA_TV - offset) / sensitivitas);
86 nilaiarusAC = ((VA_AC - offset) / sensitivitas);
87 nilaiarusPC = ((VA_PC - offset) / sensitivitas);
88 nilaiarusLamp = ((VA_LAMP - offset) / sensitivitas);
89 nilaiarusRefrigator = ((VA_Refrigator - offset) / sensitivitas);
90
91 Serial.print("Tegangan TV = ");

Ln 50, Col 41 X No board selected

File Edit Sketch Tools Help
[Icons] Select Board [Icons]

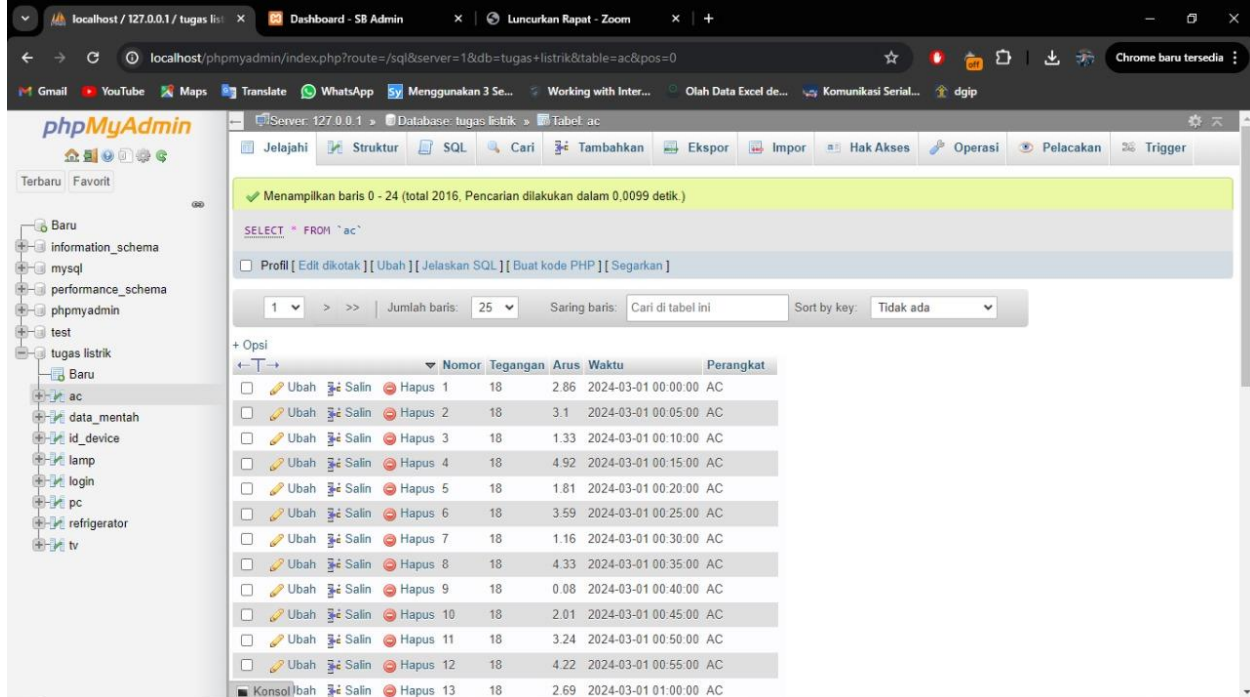
hardware.ino
92 Serial.print(nilaiTeganganTV);
93 Serial.print(" , Tegangan AC = ");
94 Serial.print(nilaiTeganganAC);
95 Serial.print(" , Tegangan PC = ");
96 Serial.print(nilaiTeganganPC);
97 Serial.print(" , Tegangan Lamp = ");
98 Serial.print(nilaiTeganganLamp);
99 Serial.print(" , Tegangan Refrigerator = ");
100 Serial.println(nilaiTeganganRefrigator);
101
102 Serial.print("arus TV = ");
103 Serial.print(nilaiarusTV);
104 Serial.print(" , arus AC = ");
105 Serial.print(nilaiarusAC);
106 Serial.print(" , arus PC = ");
107 Serial.print(nilaiarusPC);
108 Serial.print(" , arus Lamp = ");
109 Serial.print(nilaiarusLamp);
110 Serial.print(" , arus Refrigerator = ");
111 Serial.println(nilaiarusRefrigator);
112 }

Ln 50, Col 41 X No board selected

112 }
113 void kirimdata() {
114 String sendDataTegangan = String(tanggal) + ',' + String(nilaiTeganganTV) + ',' + String(nilaiTegangan.
115 String sendDataArus = String(nilaiarusTV) + ',' + String(nilaiarusAC) + ',' + String(nilaiarusPC) + ',
116 String sendData = sendDataTegangan + sendDataArus;
117 std::unique_ptr<BearSSL::WiFiClientSecure> client(new BearSSL::WiFiClientSecure);
118 client->setInsecure();
119 https.begin(*client, sendData);
120 int httpResponseCode = https.GET();
121 String payload = https.getString();
122 Serial.println(payload);
123 https.end();
124 }
125
```

2. Output data dari mikrokontroller (berupa data Tegangan dan Arus pada setiap perangkat dengan delay yang telah ditentukan) dijadikan input untuk membuat model machine learning untuk memperkirakan sisa tagihan listrik pada bulan tersebut dan mengidentifikasi kontribusi perangkat terhadap biaya.

## RANCANGAN SISTEM DATABASE PENAMPUNGAN DATA TEGANGAN PERANGKAT LISTRIK



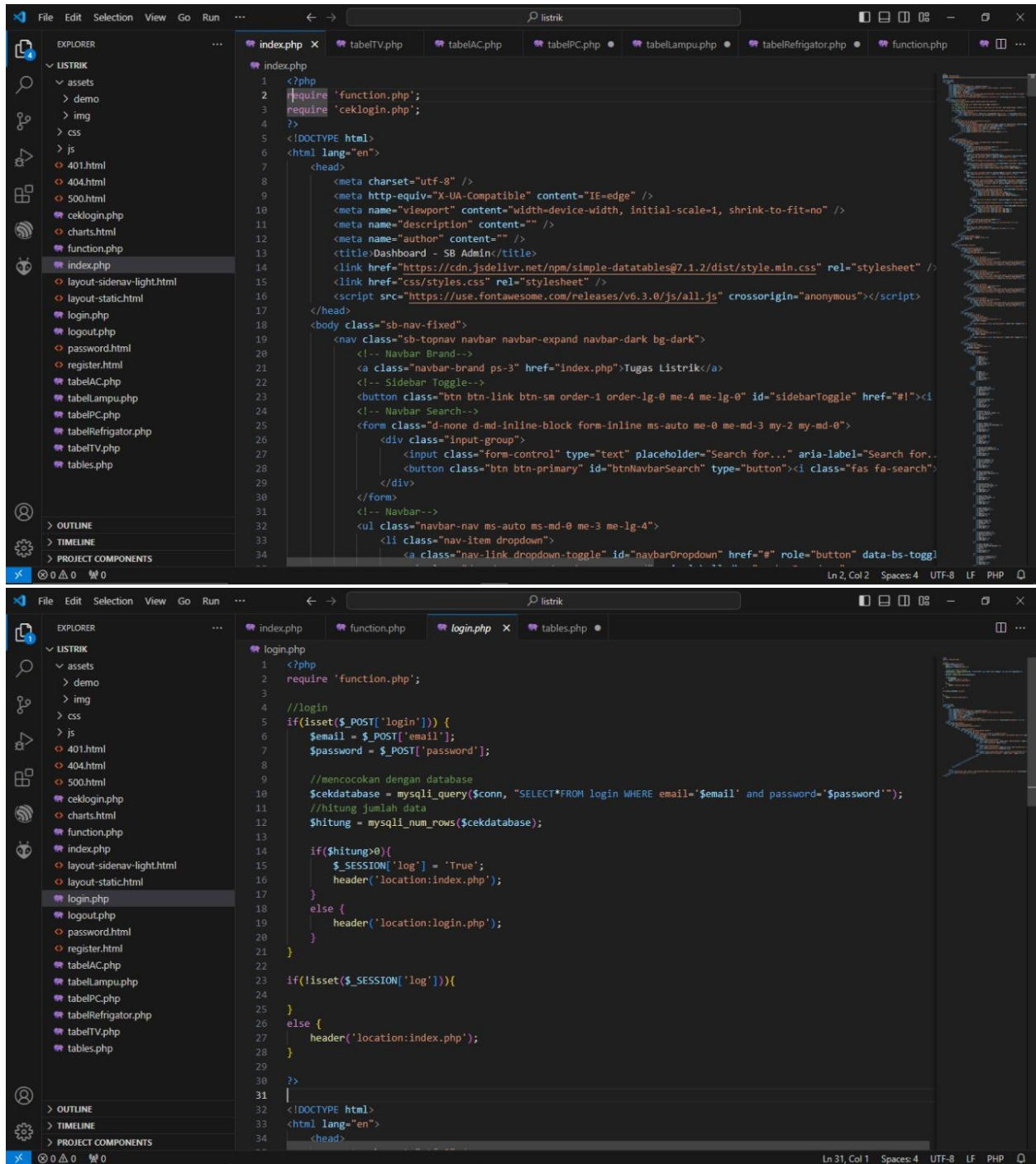
The screenshot shows the phpMyAdmin interface for a database named 'tugas listrik'. The table 'ac' is selected, displaying 13 rows of data. The columns are Nomor, Tegangan, Arus, Waktu, and Perangkat. Each row includes action icons (Ubah, Salin, Hapus) and a 'Konsol' button at the bottom.

	Nomor	Tegangan	Arus	Waktu	Perangkat
<input type="checkbox"/> Ubah <input type="checkbox"/> Salin <input type="checkbox"/> Hapus	1	18	2.86	2024-03-01 00:00:00	AC
<input type="checkbox"/> Ubah <input type="checkbox"/> Salin <input type="checkbox"/> Hapus	2	18	3.1	2024-03-01 00:05:00	AC
<input type="checkbox"/> Ubah <input type="checkbox"/> Salin <input type="checkbox"/> Hapus	3	18	1.33	2024-03-01 00:10:00	AC
<input type="checkbox"/> Ubah <input type="checkbox"/> Salin <input type="checkbox"/> Hapus	4	18	4.92	2024-03-01 00:15:00	AC
<input type="checkbox"/> Ubah <input type="checkbox"/> Salin <input type="checkbox"/> Hapus	5	18	1.81	2024-03-01 00:20:00	AC
<input type="checkbox"/> Ubah <input type="checkbox"/> Salin <input type="checkbox"/> Hapus	6	18	3.59	2024-03-01 00:25:00	AC
<input type="checkbox"/> Ubah <input type="checkbox"/> Salin <input type="checkbox"/> Hapus	7	18	1.16	2024-03-01 00:30:00	AC
<input type="checkbox"/> Ubah <input type="checkbox"/> Salin <input type="checkbox"/> Hapus	8	18	4.33	2024-03-01 00:35:00	AC
<input type="checkbox"/> Ubah <input type="checkbox"/> Salin <input type="checkbox"/> Hapus	9	18	0.08	2024-03-01 00:40:00	AC
<input type="checkbox"/> Ubah <input type="checkbox"/> Salin <input type="checkbox"/> Hapus	10	18	2.01	2024-03-01 00:45:00	AC
<input type="checkbox"/> Ubah <input type="checkbox"/> Salin <input type="checkbox"/> Hapus	11	18	3.24	2024-03-01 00:50:00	AC
<input type="checkbox"/> Ubah <input type="checkbox"/> Salin <input type="checkbox"/> Hapus	12	18	4.22	2024-03-01 00:55:00	AC
<input type="checkbox"/> Ubah <input type="checkbox"/> Salin <input type="checkbox"/> Hapus	13	18	2.69	2024-03-01 01:00:00	AC

3. Pemodelan machine learning berdasarkan data historis dan menilai kinerjanya menggunakan metrik yang relevan dan diintegrasikan pada aplikasi web.



# RANCANGAN DESAIN WEB



The screenshot shows the Visual Studio Code editor with the 'listrik' project open. The Explorer sidebar on the left lists the project structure, including 'assets', 'demo', 'img', 'css', 'js', and various HTML and PHP files. The 'tables.php' file is selected and its content is displayed in the main editor area. The code is a PHP file that includes 'function.php' and 'ceklogin.php', and it uses Bootstrap 5 and jQuery. It features a search bar and a sidebar toggle button. The status bar at the bottom indicates the cursor is at line 101, column 39.

```
1 <?php
2 require 'function.php';
3 require 'ceklogin.php';
4 ?>
5
6 <!DOCTYPE html>
7 <html lang="en">
8   <head>
9     <meta charset="utf-8" />
10    <meta http-equiv="X-UA-Compatible" content="IE=edge" />
11    <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no" />
12    <meta name="description" content="" />
13    <meta name="author" content="" />
14    <title>Tables - SB Admin</title>
15    <link href="https://cdn.jsdelivr.net/npm/simple-datatables@7.1.2/dist/style.min.css" rel="stylesheet" />
16    <link href="css/styles.css" rel="stylesheet" />
17    <script src="https://use.fontawesome.com/releases/v6.3.0/js/all.js" crossorigin="anonymous"></script>
18  </head>
19  <body class="sb-nav-fixed">
20    <nav class="sb-topnav navbar navbar-expand navbar-dark bg-dark">
21      <!-- Navbar Brand -->
22      <a class="navbar-brand ps-3" href="index.php">Start Bootstrap</a>
23      <!-- Sidebar Toggle -->
24      <button class="btn btn-link btn-sm order-1 order-lg-0 me-4 me-lg-0" id="sidebarToggle" href="#!"><i
25      <!-- Navbar Search -->
26      <form class="d-none d-md-inline-block form-inline ms-auto me-0 me-md-3 my-2 my-md-0">
27        <div class="input-group">
28          <input class="form-control" type="text" placeholder="Search for..." aria-label="Search for..."
29          <button class="btn btn-primary" id="btnNavbarSearch" type="button"><i class="fas fa-search">
30        </div>
31      </form>
32      <!-- Navbar -->
33      <ul class="navbar-nav ms-auto ms-md-0 me-3 me-lg-4">
34        <li class="nav-item dropdown">
```

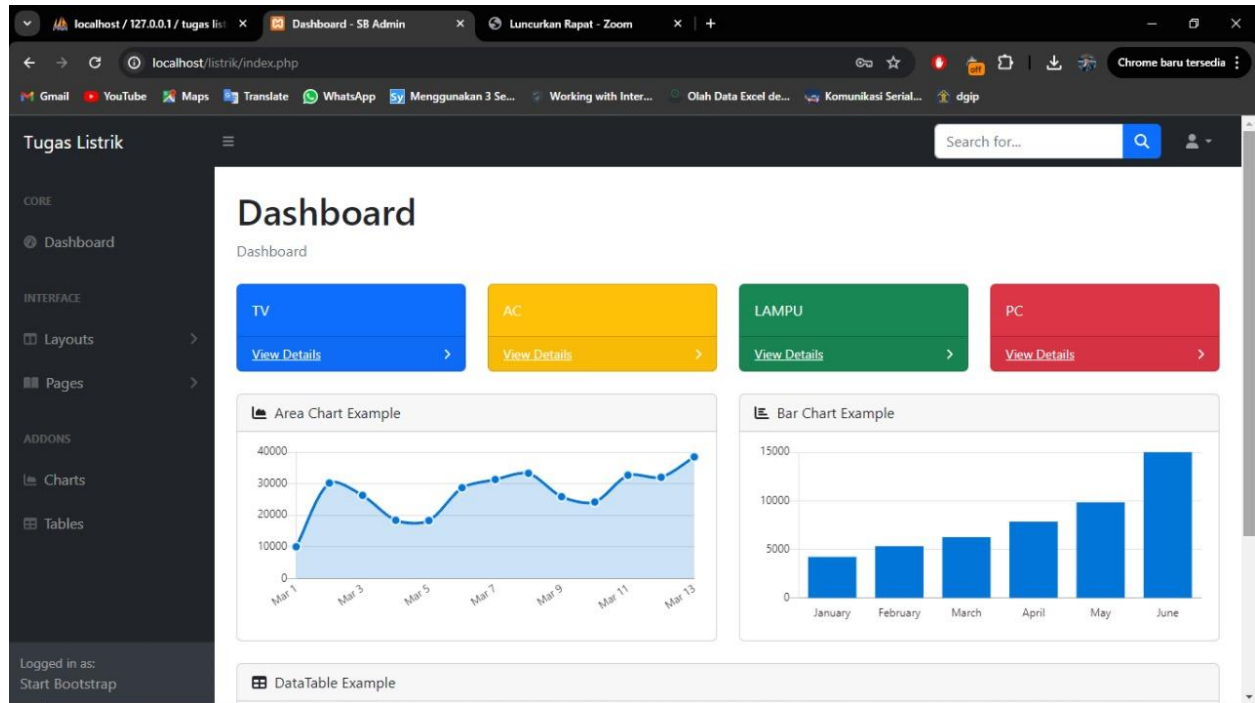
The screenshot shows the Visual Studio Code editor with the 'listrik' project open. The Explorer sidebar on the left lists the project structure, including 'assets', 'demo', 'img', 'css', 'js', and various HTML and PHP files. The 'function.php' file is selected and its content is displayed in the main editor area. The code is a PHP file that initializes a session, connects to a MySQL database, and defines a function to connect to the database. The status bar at the bottom indicates the cursor is at line 7, column 3.

```
1 <?php
2 session_start();
3 //koneksi database
4 $conn = mysqli_connect("localhost","root","","tugas listrik");
5
6
7 ?>
```



4. Output dari pengembangan web adalah pengguna dapat melihat perkiraan tagihan listrik dan peringkat perangkat berdasarkan kontribusinya.

### TAMPILAN DASHBOARD WEB



5. Kerangka aplikasi web dapat menggunakan jenis apa pun, namun Python harus digunakan untuk bagian pengembangan AI.

