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LAMPIRAN 1 – Listing Program Arduino IDE

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

const int MPU6050_Address = 0x68;
// MPU6050 I2C
const int SDA_PIN = 21;
const int SCL_PIN = 22;

int16_t AcX, AcY, AcZ;
float AccX, AccY, AccZ;

#define ssid "Haryantojabir"
#define password "riyojabir11"

#define FIREBASE_HOST
"https://kemiringan-39559-default-
rtadb.firebaseio.com/"
#define FIREBASE_AUTH
"5G04qVA0M89qHbzpsxW6zaUBQP
BhVpu272GqCDr6"

//Define FirebaseESP32 data object
FirebaseData firebaseData;
FirebaseJson json;

void setup(){
  Serial.begin(9600);
  Wire.begin(SDA_PIN, SCL_PIN);
  MPU6050_Init();

  WiFi.begin(ssid, password);
  Firebase.begin(FIREBASE_HOST,
FIREBASE_AUTH);
  Firebase.reconnectWiFi(true);

  Firebase.setReadTimeout(firebaseD
ata, 1000 * 60);

  Firebase.setwriteSizeLimit(firebase
Data, "tiny");
  Serial.println("-----
-----");
  Serial.println("Connected...");
}
void loop(){
  if(WiFi.status() ==
WL_CONNECTED){
    Serial.println("Wifi terhubung!");
    Serial.print("IP address : ");
    Serial.println(WiFi.localIP());
  } else{
    Serial.println("WiFi tidak
terhubung!");}

  Read_Raw_Data();

  // Calculate roll angle
  float roll = atan2(AccY, AccZ) * 90 /
PI;

  // Convert roll to values between 0
and 90 with a step of 5
  int roundedRoll = round(roll);
  int convertedRoll = (roundedRoll
>= 0) ? 90 - roundedRoll : 90 -
abs(roundedRoll);

  String status;
  if (isSafe(convertedRoll)) {
    // Aman
    Serial.println("Tiang listrik Dalam
Keadaan Aman");
    status = "Tiang listrik Dalam
Keadaan Aman";
  } else if (isWarning(convertedRoll))
  {
    // Waspada
```

```

    Serial.println("Waspada Segera
Periksa");
    status = "Waspada Segera
Periksa";
} else {
    // Darurat
    Serial.println("Darurat");
    status = "Darurat";
}

// Print converted roll value
Serial.print("Converted Roll: ");
Serial.println(convertedRoll);

json.set("/derajat", convertedRoll);
json.set("/status", status);

if
(Firebase.setJSON(firebaseData,"/Sensor",json)) {
    Serial.println("data terkirim !");
} else {
    Serial.println("data tidak
terkirim !");
}

delay(1000);}

void MPU6050_Init() {

Wire.beginTransmission(MPU6050_
Address);
Wire.write(0x6B); //
PWR_MGMT_1 register
Wire.write(0); // Set to zero
(wakes up the MPU-6050)
Wire.endTransmission(true);
}

void Read_Raw_Data() {

```

```

Wire.beginTransmission(MPU6050_
Address);
Wire.write(0x3B); // Starting
register address for AccX
Wire.endTransmission(false);

Wire.requestFrom(MPU6050_Addre
ss, 14, true);

AcX = Wire.read() << 8 |
Wire.read();
AcY = Wire.read() << 8 |
Wire.read();
AcZ = Wire.read() << 8 |
Wire.read();

// Sensitivity Scale Factor = 16384;
Acc values are 16-bits
AccX = (float)AcX / 16384.0;
AccY = (float)AcY / 16384.0;
AccZ = (float)AcZ / 16384.0;
}

bool isSafe(int convertedRoll) {
    // Implement your logic for safe
condition (90-80)
    return (convertedRoll >= 0 &&
convertedRoll <= 10);
}

bool isWarning(int convertedRoll) {
    // Implement your logic for
warning condition (80-70)
    return (convertedRoll >= 11 &&
convertedRoll < 20);
}
return (convertedRoll >= 21 &&
convertedRoll < 45);
}

```

LAMPIRAN 1 – Listing Program Aplikasi

```
<!doctype html>
<html>

<head>
  <title>MONITORING
  KEMIRINGAN TIANG
  LISTRIK</title>
  <script
src="http://cdn.firebase.com/js/client/1.0.6/firebase.js"></script>
  <script
src="https://www.gstatic.com/firebasejs/5.0.4/firebase.js"></script>

  <meta name="viewport"
content="width=device-width,
initial-scale=1">
  <link rel="icon" href="data:,">
  <link rel="stylesheet"

href="https://fonts.googleapis.com/
css2?family=Material+Symbols+Outl
ined:opsz,wght,FILL,GRAD@24,400,
0,0" />
  <link
href="https://fonts.googleapis.com/
css?family=Roboto:400,700,300|Mat
erial+Icons" rel="stylesheet">
  <link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.
com/bootstrap/3.3.7/css/bootstrap.
min.css"
  integrity="sha384-
BVYiISiFeK1dGmJRAkycuHAHRg32
OmUcww7on3RYdg4Va+PmSTsz/K
68vbdEjh4u"
crossorigin="anonymous">
  <link rel="stylesheet"
href="https://cdnjs.cloudflare.com/
ajax/libs/font-
awesome/4.7.0/css/fontawesome.m
in.css">

<style>
  html {
    font-family: Helvetica;
    display: inline-block;
    margin: 0px auto;
    text-align: center;
  }

  body {
    background-color: #292929;
    background-size: cover;
  }

  h1 {
    color: #e5e619;
    font-family: takara;
  }

  .row {
    display: flex;
    justify-content: center;
    align-items: center;
    height: 30vh;
  }

  .col-lg-4 {
    margin: 10px;
  }

  .card {
    display: inline-block;
    position: relative;
    width: 100%;
    margin: 25px 0;
    box-shadow: 0 1px 4px 0
    rgba(0, 0, 0, 0.14);
    border-radius: 3px;
```

```

        color: rgba(0, 0, 0, 0.87);
        background: #e5e619;
    }

    .card .card-content {
        padding: 15px 20px;
    }

    .card .card-content .category {
        margin-bottom: 0;
    }

    .card .card-header {
        box-shadow: 0 10px 30px -
12px rgba(0, 0, 0, 0.42), 0 4px 25px
0px rgba(0, 0, 0, 0.12), 0 8px 10px -
5px rgba(0, 0, 0, 0.2);
        margin: -20px 15px 0;
        border-radius: 3px;
        padding: 15px;
        background-color: black;
    }

    .card .card-header .title {
        color: #FFFFFF;
    }

    .card .card-header .category {
        margin-bottom: 0;
        color: rgba(255, 255, 255,
0.62);
    }

    .card .card-header .card-chart {
        padding: 0;
        min-height: 160px;
    }

    .card .card-footer {
        margin: 0 20px 10px;
        padding-top: 10px;
        border-top: 1px solid #eeeeee;
    }
}

    .card .card-footer .content {
        display: block;
    }

    .card .card-footer div {
        display: inline-block;
    }

    .card .card-footer .author {
        color: #999999;
    }

    .card .card-footer .stats {
        line-height: 22px;
        color: #999999;
        font-size: 12px;
    }

    .card .card-footer .stats
.material-icons {
        position: relative;
        top: 4px;
        font-size: 16px;
    }

    .card .card-footer h6 {
        color: #999999;
    }

    .card [data-background-
color='purple'] {
        background: linear-
gradient(60deg, #ab47bc, #8e24aa);
        box-shadow: 0 12px 20px -
10px rgba(156, 39, 176, 0.28), 0 4px
20px 0px rgba(0, 0, 0, 0.12), 0 7px
8px -5px rgba(156, 39, 176, 0.2);
    }

```

```
.card [data-background-
color='blue'] {
    background: linear-
gradient(60deg, #26c6da, #00acc1);
    box-shadow: 0 12px 20px -
10px rgba(0, 188, 212, 0.28), 0 4px
20px 0px rgba(0, 0, 0, 0.12), 0 7px
8px -5px rgba(0, 188, 212, 0.2);
}
```

```
.card [data-background-
color='green'] {
    background: linear-
gradient(60deg, #66bb6a,
#43a047);
    box-shadow: 0 12px 20px -
10px rgba(76, 175, 80, 0.28), 0 4px
20px 0px rgba(0, 0, 0, 0.12), 0 7px
8px -5px rgba(76, 175, 80, 0.2);
}
```

```
.card [data-background-
color='orange'] {
    background: linear-
gradient(60deg, #ffa726, #fb8c00);
    box-shadow: 0 12px 20px -
10px rgba(255, 152, 0, 0.28), 0 4px
20px 0px rgba(0, 0, 0, 0.12), 0 7px
8px -5px rgba(255, 152, 0, 0.2);
}
```

```
.card [data-background-
color='red'] {
    background: linear-
gradient(60deg, #ef5350, #e53935);
    box-shadow: 0 12px 20px -
10px rgba(244, 67, 54, 0.28), 0 4px
20px 0px rgba(0, 0, 0, 0.12), 0 7px 8px
-5px rgba(244, 67, 54, 0.2);
}
```

```
.card [data-background-color] {
    color: #ffffff;
}

.card [data-background-color] a
{
    color: #FFFFFF;
}
```

```
.card-stats .title {
    margin: 0;
}
```

```
.card-stats .card-header {
    float: left;
    text-align: center;
}
```

```
.card-stats .card-header i {
    font-size: 36px;
    line-height: 56px;
    width: 56px;
    height: 56px;
}
```

```
.card-stats .card-content {
    text-align: right;
    padding-top: 10px;
}
```

</style>

```
<style>
/* Penyesuaian untuk perangkat
mobile */
@media screen and (max-width:
768px) {
    .row {
        height: auto;
```

```

    }

    .col-lg-4 {
        width: 100%;
        /* Membuat kolom menjadi
        lebar penuh pada perangkat mobile
        */
        margin: 10px 0;
        /* Menambahkan margin
        atas dan bawah */
    }
}
</style>

<script>
    var config = {
        apiKey:
"5G04qVA0M89qHbzpsxW6zaUBQP
BhVpu272GqCDr6",
        databaseURL:
"https://kemiringan-39559-default-
rtadb.firebaseio.com"
    };
    firebase.initializeApp(config);

    var f_database =
firebase.database();
    f_database.ref().on("value",
function (snapshot) {
        var derajat =
snapshot.child("Sensor/derajat").val
();

        document.getElementById("derajat"
).innerHTML = "" + derajat + "
Derajat";

        var status =
snapshot.child("Sensor/status").val(
);

```

```

document.getElementById("status").
innerHTML = "" + status + "";
    });

    function reloadpage() {
        window.location.reload();
    }
</script>
</head>

<body >
    <h1>MONITORING
KEMIRINGAN TIANG
LISTRIK</h1><br>
    <div class="row">
        <div class="col-lg-4 col-md-4
col-sm-4">
            <div class="card card-
stats">
                <div class="card-header"
data-background-color="black">
                    <i class="material-
symbols-outlined">°</i>
                </div>
                <div class="card-
content">
                    <p
class="category">DERAJAT</p>
                    <h3 class="title"><span
id="derajat">Silahkan
Tunggu</span></h3>
                </div>
                <div class="card-footer">
                    <div
class="stats"></div>
                </div>
            </div>
        </div>
    </div>
    <div class="row">

```

```
<div class="col-lg-4 col-md-4
col-sm-4">
  <div class="card card-
stats">
    <div class="card-header"
data-background-color="black">
      <i class="material-
symbols-outlined">□</i>
    </div>
    <div class="card-
content">
      <p
class="category">STATUS</p>
      <h3 class="title"><span
id="status">Silahkan
Tunggu</span></h3>
    </div>
    <div class="card-footer">
      <div
class="stats"></div>
    </div>
  </div>
</div>
<footer class="footer">
  <div class="container-
fluid"></div>
</footer>
</body>

</html>
```