LAMPIRAN

Website.

```
<!DOCTYPE html>
<html lang="id">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Monitor Sensor Suhu & Kelembaban Tanah</title>
    <!-- Bootstrap 5 CSS -->
    <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0/dist/css/bootstrap.min.css" rel="stylesheet">
    <!-- Bootstrap Icons -->
    <link href="https://cdn.jsdelivr.net/npm/bootstrap-icons@1.7.2/font/bootstrap-icons.css" rel="stylesheet">
    <style>
        body {
            background: linear-gradient(135deg, #667eea 0%, #764ba2 100%);
            min-height: 100vh;
        }
        .sensor-card {
            border: none;
            border-radius: 15px;
            box-shadow: 0 8px 25px rgba(0,0,0,0.1);
            transition: transform 0.3s ease;
        }
        .sensor-card:hover {
            transform: translateY(-5px);
        }
        .sensor-icon {
            font-size: 3rem;
            margin-bottom: 1rem;
        }
        .sensor-value {
            font-size: 2.5rem;
            font-weight: bold;
            margin: 0;
        }
        .sensor-unit {
            font-size: 1.2rem;
            color: #6c757d;
        }
        .status-badge {
            font-size: 0.9rem;
            padding: 0.5rem 1rem;
        }
        .temp-good { color: #28a745; }
        .temp-warning { color: #ffc107; }
        .temp-danger { color: #dc3545; }
        .humidity-low { color: #dc3545; }
        .humidity-good { color: #28a745; }
        .humidity-high { color: #17a2b8; }
        .last-update {
            font-size: 0.9rem;
            color: #6c757d;
        }
        .loading {
            display: inline-block;
            width: 20px;
            height: 20px;
            border: 3px solid #f3f3f3;
```

```
        border-top: 3px solid #3498db;
        border-radius: 50%;
        animation: spin 2s linear infinite;
      }
      @keyframes spin {
        0% { transform: rotate(0deg); }
        100% { transform: rotate(360deg); }
      }
    </style>
</head>
<body>
    <div class="container py-5">
      <!-- Header -->
      <div class="row mb-4">
        <div class="col-12 text-center text-white">
          <h1 class="display-4 mb-2">
            <i class="bi bi-thermometer-half"></i>
            Monitor Sensor
          </h1>
          <p class="lead">Monitoring Suhu & Kelembaban Tanah</p>
        </div>
      </div>

      <!-- Status Koneksi -->
      <div class="row mb-4">
        <div class="col-12">
          <div class="card sensor-card">
            <div class="card-body text-center py-3">
              <span id="connectionStatus" class="badge bg-secondary">
                <span class="loading"></span> Menghubungkan...
              </span>
              <span id="lastUpdate" class="last-update ms-3">-</span>
            </div>
          </div>
        </div>
      </div>

      <!-- Sensor Cards -->
      <div class="row g-4">
        <!-- Card Suhu -->
        <div class="col-md-6">
          <div class="card sensor-card h-100">
            <div class="card-body text-center p-4">
              <i class="bi bi-thermometer-half sensor-icon text-danger"></i>
              <h4 class="card-title mb-3">Suhu Tanah</h4>
              <p id="tempValue" class="sensor-value text-danger">--</p>
              <span class="sensor-unit">°C</span>
              <div class="mt-3">
                <span id="tempStatus" class="badge status-badge bg-secondary">Menunggu data...</span>
              </div>

            </div>
          </div>
        </div>

        <!-- Card Kelembaban -->
        <div class="col-md-6">
          <div class="card sensor-card h-100">
```

```
            <div class="card-body text-center p-4">
                <i class="bi bi-droplet-half sensor-icon text-primary"></i>
                <h4 class="card-title mb-3">Kelembaban Tanah</h4>
                <p id="humidityValue" class="sensor-value text-primary">--</p>
                <span class="sensor-unit">%</span>
                <div class="mt-3">
                    <span id="humidityStatus" class="badge status-badge bg-secondary">Menunggu data...</span>
                </div>

            </div>
        </div>
    </div>
</div>

<!-- Bootstrap 5 JS -->
<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0/dist/js/bootstrap.bundle.min.js"></script>

<!-- Firebase SDK -->
<script type="module">
    // Import Firebase modules
    import { initializeApp } from 'https://www.gstatic.com/firebasejs/9.22.0/firebase-app.js';
    import { getDatabase, ref, onValue } from 'https://www.gstatic.com/firebasejs/9.22.0/firebase-database.js';

    // Konfigurasi Firebase - GANTI DENGAN KONFIGURASI ANDA
    const firebaseConfig = {
        apiKey: "AIzaSyDGGmnGt6N41btFSeoMLM6SFUBGMmSCjkg",
        authDomain: "monitoring-sensor-2d657.firebaseapp.com",
        databaseURL: "https://monitoring-sensor-2d657-default-rtdb.asia-southeast1.firebasedatabase.app",
        projectId: "monitoring-sensor-2d657",
        storageBucket: "monitoring-sensor-2d657.firebasestorage.app",
        messagingSenderId: "720670683334",
        appId: "1:720670683334:web:08d2e60edc89b1a980e7c7"


    };

    // Initialize Firebase
    const app = initializeApp(firebaseConfig);
    const database = getDatabase(app);

    // Array untuk menyimpan riwayat data
    let dataHistory = [];

    // Fungsi untuk menentukan status suhu
    function getTempStatus(temp) {
        if (temp < 20) return { text: 'Dingin', class: 'bg-info' };
```

```
        if (temp <= 30) return { text: 'Normal', class: 'bg-success' };
        if (temp <= 35) return { text: 'Hangat', class: 'bg-warning' };
        return { text: 'Panas', class: 'bg-danger' };
        return(temp);
    }

    // Fungsi untuk menentukan status kelembaban
    function getHumidityStatus(humidity) {
        if (humidity < 60) return { text: 'Kering', class: 'bg-warning' };
        if (humidity <= 80) return { text: 'Lembab', class: 'bg-success' };
        return(humidity);
    }

    // Fungsi untuk memformat waktu
    function formatTime(timestamp) {
        const date = new Date(timestamp);
        return date.toLocaleString('id-ID');
    }

    // Listen untuk perubahan data suhu
    const tempRef = ref(database, 'sensor/suhu');
    onValue(tempRef, (snapshot) => {
        const temp = snapshot.val();
        if (temp !== null) {

document.getElementById('tempValue').textContent = temp.toFixed(1);

            const status = getTempStatus(temp);
            const statusElement = document.getElementById('tempStatus');
            statusElement.textContent = status.text;
            statusElement.className = `badge status-badge ${status.class}`;
        }
    });

    // Listen untuk perubahan data kelembaban
    const humidityRef = ref(database, 'sensor/kelembaban');
    onValue(humidityRef, (snapshot) => {
        const humidity = snapshot.val();
        if (humidity !== null) {

document.getElementById('humidityValue').textContent = humidity;

            const status = getHumidityStatus(humidity);
            const statusElement = document.getElementById('humidityStatus');
            statusElement.textContent = status.text;
            statusElement.className = `badge status-badge ${status.class}`;
        }
    });

    // Listen untuk semua data sensor
    const sensorRef = ref(database, 'sensor');
    onValue(sensorRef, (snapshot) => {
        const data = snapshot.val();
```

```
        if (data && data.suhu !== undefined
&& data.kelembaban !== undefined) {
            // Update status koneksi

document.getElementById('connectionStatu
s').innerHTML =
                '<i class="bi bi-wifi"></i>
Terhubung';

document.getElementById('connectionStatu
s').className = 'badge bg-success';

            // Update waktu terakhir

document.getElementById('lastUpdate').text
Content =
                'Terakhir diperbarui: ' + new
Date().toLocaleTimeString('id-ID');

            // Tambah ke riwayat
            dataHistory.push({
              timestamp: Date.now(),
              temp: data.suhu,
              humidity: data.kelembaban
            });

            // Batasi riwayat maksimal 20 data
            if (dataHistory.length > 20) {
              dataHistory = dataHistory.slice(-
20);
            }

            updateHistoryTable();
          }
        }, (error) => {
          console.error('Error:', error);

document.getElementById('connectionStatu
s').innerHTML =
                '<i class="bi bi-wifi-off"></i>
Terputus';

document.getElementById('connectionStatu
s').className = 'badge bg-danger';
        });

        // Auto refresh setiap 30 detik untuk
update waktu
        setInterval(() => {
          const lastUpdate =
document.getElementById('lastUpdate');
          if (lastUpdate.textContent !== '-') {
            // Update indikator bahwa sistem
masih berjalan
            console.log('Dashboard masih
aktif:', new Date().toLocaleTimeString());
          }
        }, 30000);
    </script>
</body>
</html>
```

Arduino

```
// Library untuk sensor, WiFi, Firebase, dan
LCD I2C
#include <OneWire.h>
#include <DallasTemperature.h>
#include <WiFi.h>
#include <FirebaseESP32.h>
#include <LiquidCrystal_I2C.h>
#include <Wire.h>

// Konfigurasi WiFi
#define WIFI_SSID "Aradah"
```

```
#define WIFI_PASSWORD "12345678"

// Konfigurasi Firebase
#define FIREBASE_HOST "https://monitoring-sensor-2d657-default-rtdb.asia-southeast1.firebasedatabase.app/"
#define FIREBASE_AUTH "AIzaSyDGGmnGt6N41btFSeoMLM6SFUBGMmSCjkg"

// Pin sensor
#define SUHU_PIN 4        // Pin DS18B20
#define TANAH_PIN 34      // Pin sensor kelembaban tanah

// Setup sensor suhu
OneWire oneWire(SUHU_PIN);
DallasTemperature sensorSuhu(&oneWire);

// Setup LCD I2C (alamat 0x27, ukuran 16x2)
LiquidCrystal_I2C lcd(0x27, 16, 2);

// Firebase objects
FirebaseData firebaseData;
FirebaseConfig config;
FirebaseAuth auth;

void setup() {
  Serial.begin(115200);
  Serial.println("Memulai sistem...");

  // Setup LCD
  lcd.begin();
  lcd.backlight();
  lcd.setCursor(0, 0);
  lcd.print("Sensor Monitor");
  lcd.setCursor(0, 1);
  lcd.print("Starting...");
  delay(2000);

  // Setup sensor suhu
  sensorSuhu.begin();

  // Koneksi WiFi
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("Connecting WiFi");
  WiFi.begin(WIFI_SSID, WIFI_PASSWORD);
  Serial.print("Menghubungkan ke WiFi");

  int wifiRetry = 0;
  while (WiFi.status() != WL_CONNECTED && wifiRetry < 20) {
    delay(500);
    Serial.print(".");
    lcd.setCursor(wifiRetry % 16, 1);
    lcd.print(".");
    wifiRetry++;
  }

  if (WiFi.status() == WL_CONNECTED) {
    Serial.println();
    Serial.print("WiFi terhubung! IP: ");
    Serial.println(WiFi.localIP());

    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("WiFi Connected!");
    lcd.setCursor(0, 1);
    lcd.print(WiFi.localIP());
    delay(2000);
  } else {
    lcd.clear();
```

```
    lcd.setCursor(0, 0);
    lcd.print("WiFi Failed!");
    lcd.setCursor(0, 1);
    lcd.print("Check Settings");
    while(1); // Stop program jika WiFi gagal
  }

  // Setup Firebase
  config.host = FIREBASE_HOST;
  config.signer.tokens.legacy_token = FIREBASE_AUTH;

  Firebase.begin(&config, &auth);
  Firebase.reconnectWiFi(true);

  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print("Firebase Ready!");
  delay(1000);

  Serial.println("Firebase terhubung!");
  Serial.println("Sensor siap!");
}

void loop() {
  Serial.println("Membaca sensor...");

  // Baca suhu
  sensorSuhu.requestTemperatures();
  float suhu = sensorSuhu.getTempCByIndex(0);

  // Baca kelembaban tanah (konversi ke persentase)
  int nilaiAnalog = analogRead(TANAH_PIN);
  int kelembaban = map(nilaiAnalog, 4095, 0, 0, 100); // ESP32 ADC 12-bit

  // Validasi pembacaan sensor
  if (suhu != DEVICE_DISCONNECTED_C) {
    // Tampilkan di LCD
    lcd.clear();

    // Baris pertama: Suhu
    lcd.setCursor(0, 0);
    lcd.print("Suhu: ");
    lcd.print(suhu, 1); // 1 digit desimal
    lcd.print((char)223); // Simbol derajat °
    lcd.print("C");

    // Baris kedua: Status kelembapan
    lcd.setCursor(0, 1);
    if (kelembaban < 60) {
      lcd.print("Status: Kering");
    } else {
      lcd.print("Status: Lembap");
    }

    // Kirim data ke Firebase
    if (Firebase.setFloat(firebaseData, "/sensor/suhu", suhu)) {
      Serial.println("Suhu berhasil dikirim ke Firebase");
    } else {
      Serial.println("Gagal mengirim suhu: " + firebaseData.errorReason());
    }

    if (Firebase.setInt(firebaseData, "/sensor/kelembaban", kelembaban)) {
```

```
    Serial.println("Kelembaban berhasil
dikirim ke Firebase");
   } else {
    Serial.println("Gagal mengirim
kelembaban: " +
firebaseData.errorReason());
   }

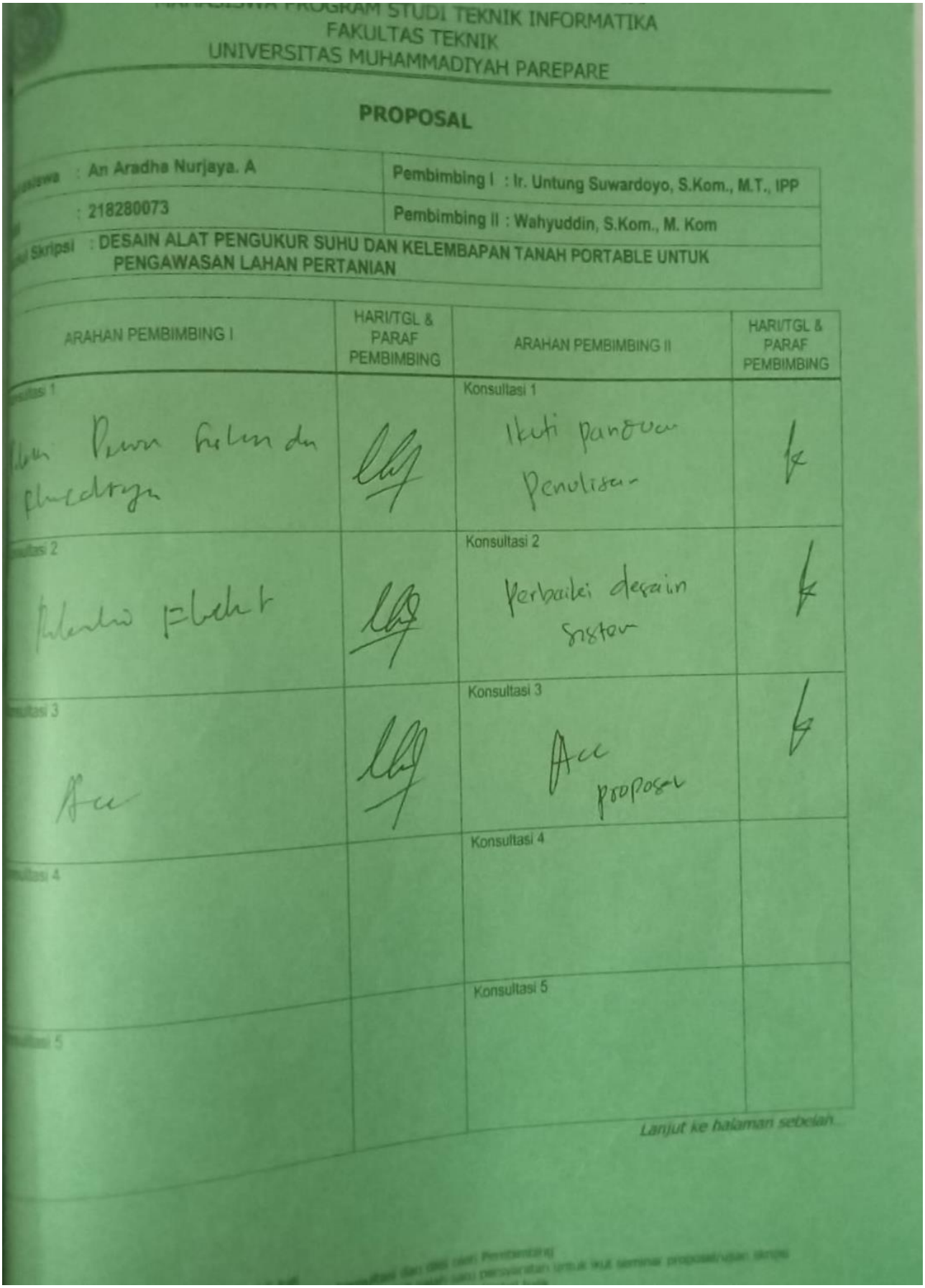
   // Kirim timestamp
   Firebase.setString(firebaseData,
"/sensor/timestamp", String(millis()));

   // Debug ke Serial
   Serial.print("Suhu: ");
   Serial.print(suhu);
   Serial.println("°C");
   Serial.print("Kelembaban Tanah: ");
   Serial.print(kelembaban);
   Serial.println("%");
   Serial.println("---");
  } else {
   Serial.println("Error: Sensor suhu tidak
terbaca!");

   // Tampilkan error di LCD
   lcd.clear();
   lcd.setCursor(0, 0);
   lcd.print("Sensor Error!");
   lcd.setCursor(0, 1);
   lcd.print("Check DS18B20");
  }

  delay(5000);
}
```

Lampiran – 1 Kartu Monitoring Bimbingan Proposal



PROGRAM STUDI TEKNIK INFORMATIKA
FAKULTAS TEKNIK
UNIVERSITAS MUHAMMADIYAH PAREPARE

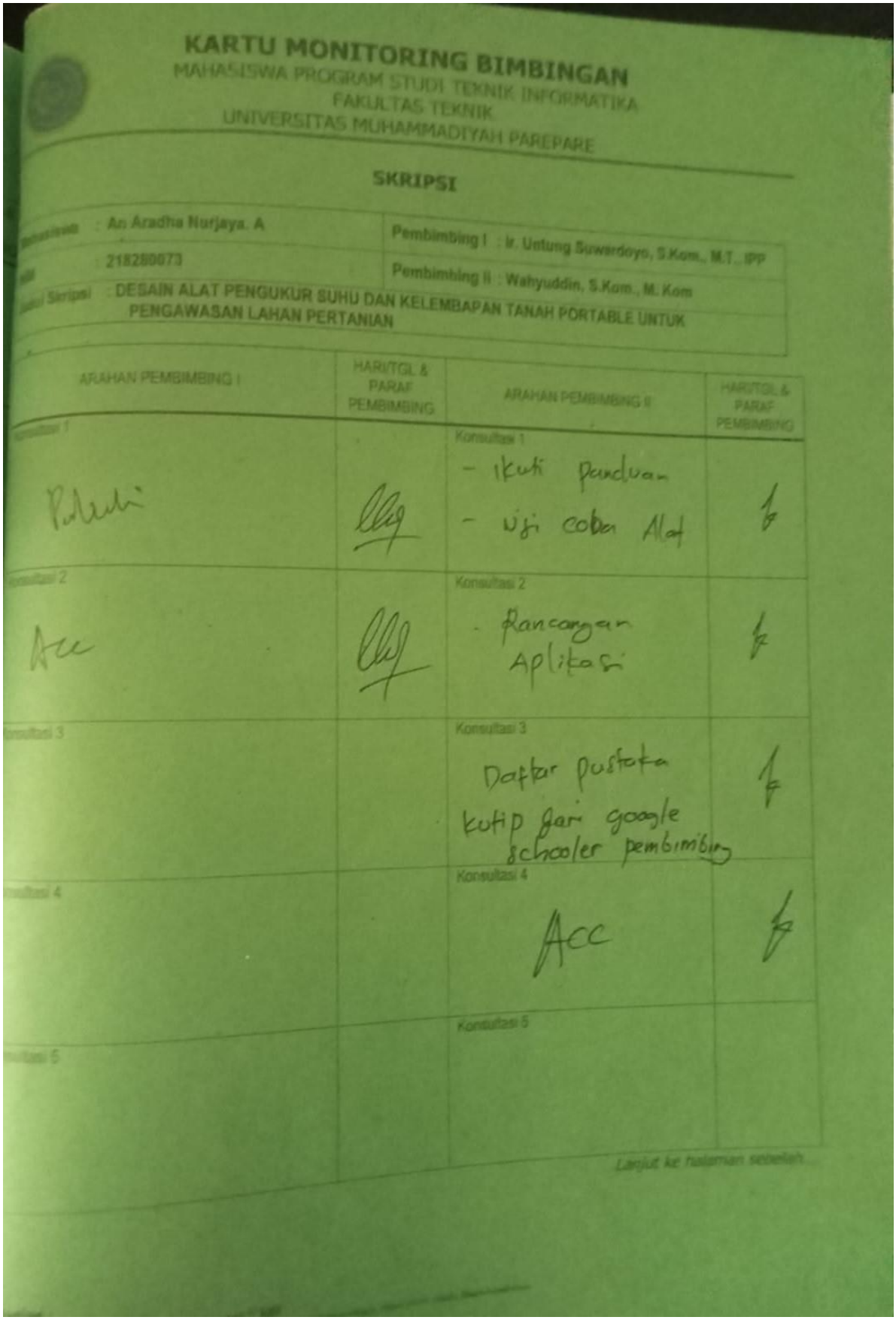
PROPOSAL

Mahasiswa : An Aradha Nurjaya. A	Pembimbing I : Ir. Untung Suwardoyo, S.Kom., M.T., IPP
: 218280073	Pembimbing II : Wahyuddin, S.Kom., M. Kom
Judul Skripsi : DESAIN ALAT PENGUKUR SUHU DAN KELEMBAPAN TANAH PORTABLE UNTUK PENGAWASAN LAHAN PERTANIAN	

ARAHAN PEMBIMBING I	HARI/TGL & PARAF PEMBIMBING	ARAHAN PEMBIMBING II	HARI/TGL & PARAF PEMBIMBING
Konsultasi 1 Ide Power Point dan Flowchart		Konsultasi 1 Ikuti panduan penulisan	
Konsultasi 2 Flowchart Flowchart		Konsultasi 2 Perbaiki desain sistem	
Konsultasi 3 Acc		Konsultasi 3 Acc proposal	
Konsultasi 4		Konsultasi 4	
Konsultasi 5		Konsultasi 5	

Lanjut ke halaman sebelah

Lampiran – 2 Kartu Monitoring Bimbingan Skripsi



KARTU MONITORING BIMBINGAN
MAHASISWA PROGRAM STUDI TEKNIK INFORMATIKA
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SKRIPSI

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ARAHAN PEMBIMBING I	HARI/TGL & PARAF PEMBIMBING	ARAHAN PEMBIMBING II	HARI/TGL & PARAF PEMBIMBING
Konsultasi 1 Revisi		Konsultasi 1 - Ikuti panduan - Uji coba Alat	
Konsultasi 2 Acc		Konsultasi 2 - Rancangan Aplikasi	
Konsultasi 3		Konsultasi 3 Daftar pustaka kutip dari google schooler pembimbing	
Konsultasi 4		Konsultasi 4 Acc	
Konsultasi 5		Konsultasi 5	

Lanjut ke halaman selanjutnya