**Plant Care System - Deployment and Test Documentation**

**1. Deployment Instructions**

**Prerequisites**

* **Azure Account**
* **Node.js v22.13.1**
* **npm v11.0.0**
* **VS Code**

**Step 1: Azure Resources Setup**

1. **IoT Hub (PlantHub)** 
   * **Create IoT Hub in Azure Portal**
   * **Create 3 devices: PlantDevice1, PlantDevice2, PlantDevice3**
   * **Save connection strings**
2. **Storage Account (plantcarestore)** 
   * **Create Storage Account**
   * **Create Table Storage**
   * **Save connection strings**

**Step 2: Project Structure Setup**

**Copy**

**PlantCareProject/**

**├── api/**

**│ ├── index.js**

**│ ├── .env**

**│ └── package.json**

**├── devices/**

**│ └── deviceSimulator.js**

**├── functions/**

**│ └── ProcessPlantData/**

**└── .env**

**Step 3: Environment Configuration**

1. **Root .env file:**

**Copy**

**DEVICE1\_CONNECTION\_STRING=<your-device1-connection>**

**DEVICE2\_CONNECTION\_STRING=<your-device2-connection>**

**DEVICE3\_CONNECTION\_STRING=<your-device3-connection>**

1. **API .env file:**

**Copy**

**AZURE\_STORAGE\_CONNECTION\_STRING=<your-storage-connection>**

**PORT=3000**

**2. Test Instructions**

**A. Device Simulator Testing**

1. **Start device simulator:**

**bash**

**Copy**

**cd PlantCareProject**

**node index.js**

**Expected output:**

* **"PlantDevice1 connected successfully"**
* **"PlantDevice2 connected successfully"**
* **"PlantDevice3 connected successfully"**

1. **Verify data sending:**

* **Check console for moisture readings**
* **Verify timestamps**
* **Monitor connection status**

**B. API Testing**

1. **Start API server:**

**bash**

**Copy**

**cd api**

**node index.js**

1. **Test Endpoints:**

* **GET /api/devices**

**Copy**

**http://localhost:3000/api/devices**

**Expected: List of all devices with current readings**

* **GET /api/devices/:deviceId/history**

**Copy**

**http://localhost:3000/api/devices/PlantDevice1/history**

**Expected: Historical data for specific device**

* **GET /api/alerts**

**Copy**

**http://localhost:3000/api/alerts**

**Expected: List of low moisture alerts**

**C. Data Verification**

1. **Check Azure Portal:** 
   * **Verify IoT Hub messages**
   * **Check Table Storage for data**
   * **Monitor for any errors**
2. **Verify Data Format:**

**json**

**Copy**

**{**

**"deviceId": "PlantDevice1",**

**"moisture": 45,**

**"timestamp": "2025-01-27T19:43:58.331Z",**

**"status": "Normal"**

**}**

**D. Troubleshooting Guide**

1. **Connection Issues:** 
   * **Verify connection strings**
   * **Check Azure resource status**
   * **Confirm network connectivity**
2. **Data Flow Issues:** 
   * **Check device simulator logs**
   * **Verify API server logs**
   * **Monitor Azure Function logs**
3. **Common Error Resolutions:** 
   * **Restart services**
   * **Clear local storage**
   * **Update connection strings**