Deployment Instructions

1. Deploy Azure IoT Hub

1. **Create a Resource Group:**
    - Open the **Azure Portal**.
    - Navigate to **Resource Groups** and click **+ Create**.
    - Enter the following:
        - Resource Group Name: IoTHubWatering.
        - Region: UK South.
    - Click **Review + Create** > **Create**.
2. **Create an IoT Hub:**
    - Navigate to **IoT Hub** and click **+ Create**.
    - Select the Resource Group: IoTHubWatering.
    - Set Region to UK South and select the **Free tier** for testing.
    - Click **Review + Create** > **Create**.
3. **Register Devices:**
    - Navigate to your IoT Hub.
    - Click **IoT Devices** > **+ Add Device**.
    - Add devices such as SoilSensorSimulator1 and SoilSensorSimulator2.
    - Note down the **Connection String** for each device.

2. Deploy Stream Analytics Job

1. **Create a Stream Analytics Job:**
    - Navigate to **Stream Analytics Jobs** > **+ Create**.
    - Enter:
        - Name: wateringsystem_job.
        - Region: UK South.
        - Resource Group: IoTHubWatering.

- Click **Review + Create** > **Create**.

2. **Configure Input (IoT Hub):**
   - Open your Stream Analytics Job.
   - Navigate to **Inputs** > **+ Add Input** > **IoT Hub**.
   - Select your IoT Hub from the dropdown.
   - Choose JSON as the data format.
3. **Configure Output (Cosmos DB):**
   - Navigate to **Outputs** > **+ Add Output** > **Cosmos DB**.
   - Select your Cosmos DB account and set:
     - Database Name: TelemetryDB.
     - Collection Name: TelemetryData.
     - Partition Key: /device_id.
4. **Add Query:**
   - Navigate to **Query** and enter:
   - SELECT
   - IoTHub.ConnectionDeviceId AS device_id,
   - 'user_1' AS user_id,
   - soil_moisture,
   - water_level,
   - EventProcessedUtcTime AS timestamp
   - INTO
   - CosmosDBOutput
   - FROM
   - IoTHubInput
5. **Start the Job:**
   - Navigate to the **Overview** page of your Stream Analytics Job and click **Start**.

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3. Deploy Azure Cosmos DB

1. **Create a Cosmos DB Account:**
    - Navigate to **Azure Cosmos DB** > **+ Create**.
    - Choose Azure Cosmos DB for NoSQL.
    - Set:
        - Account Name: WateringSystemCosmos.
        - Region: UK South.
        - Enable Free Tier.
2. **Create Database and Container:**
    - Open your Cosmos DB account and go to **Data Explorer**.
    - Click **+ New Container** and set:
        - Database Name: TelemetryDB.
        - Container Name: TelemetryData.
        - Partition Key: /device_id.

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4. Deploy Azure Function App (API)

1. **Prepare Code:**
    - Use the code you finalized for GetDeviceData and UpdateDeviceData.
    - Add dependencies (azure-functions, azure-cosmos) to requirements.txt.
2. **Deploy Using VS Code:**
    - Install the **Azure Functions** extension in VS Code.
    - Open your function app folder.
    - Right-click the function name in the **Azure Extension Pane** and click **Deploy to Azure**.
    - Select the correct subscription and resource group.
3. **Configure App Settings:**

- Go to your deployed Function App in the Azure Portal.
- Navigate to **Configuration** > **+ New Application Setting**:
  - Key: COSMOS_DB_URL | Value: Your Cosmos DB endpoint.
  - Key: COSMOS_DB_KEY | Value: Your Cosmos DB primary key.
