### **🚀 VeriHarvest Blockchain Module**

**Role:** Blockchain Developer  
 **Module:** Smart Contract for **Food Traceability & Compliance**

## **📌 1. Overview**

This **Solidity smart contract** stores food batch details, verifies **freshness scores**, and tracks compliance. Admins can **add batches** and **update their status**.

## **📌 2. How to Deploy & Run**

### **🔹 Prerequisites**

✅ Install **Node.js & npm** ✅ Install **Hardhat** for local blockchain development  
 ✅ Install **Metamask** for testing transactions

### **🔹 Steps to Deploy**

1️⃣ **Initialize Hardhat Project**

mkdir veriharvest-blockchain && cd veriharvest-blockchain

npx hardhat init

2️⃣ **Install Dependencies**

npm install --save-dev @nomicfoundation/hardhat-toolbox

**3️⃣ Compile the Contract**

npx hardhat compile

4️⃣ **Deploy to Local Blockchain**

npx hardhat node

Then, deploy the contract using:

npx hardhat run scripts/deploy.js --network localhost

5️⃣ **Interact with Contract via Hardhat Console**

npx hardhat console --network localhost

Run:

JS

const contract = await ethers.getContractAt("VeriHarvest", "DEPLOYED\_CONTRACT\_ADDRESS");

await contract.addBatch("Organic Apples", "Farm A", 95);

await contract.getBatchDetails(1);

📌 3. Testing the Contract

Write a test in test/veriharvest.test.js:

const { expect } = require("chai");

describe("VeriHarvest Contract", function () {

let VeriHarvest, veriharvest, owner;

beforeEach(async function () {

[owner] = await ethers.getSigners();

VeriHarvest = await ethers.getContractFactory("VeriHarvest");

veriharvest = await VeriHarvest.deploy();

await veriharvest.addBatch("Organic Apples", "Farm A", 95);

});

it("Should return correct batch details", async function () {

const batch = await veriharvest.getBatchDetails(1);

expect(batch.productName).to.equal("Organic Apples");

expect(batch.status).to.equal("Safe");

});

it("Should update batch status", async function () {

await veriharvest.updateBatchStatus(1, "Warning");

const batch = await veriharvest.getBatchDetails(1);

expect(batch.status).to.equal("Warning");

});

});

Run the test:

npx hardhat test