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COURSE NAME: Blockchain  
GROUP NUMBER: 02

PROJECT TITLE:[ Design a smart contract using Ethereum blockchain where you can add the relevant documents on agriculture data into the blockchain you should be able to add the agriculture product details into the blockchain ,should be able to query the details from the blockchain and then change the details whenever it is required.]

PROJECT SUBMITTED TO: NSC Acadamy

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DEPARTMENT: Computer Science & Engineering

SEMESTER: IV  
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SPOC NAME:

**INTRODUCTION**

Blockchain technologies can track all types of information about plants, such as seed quality, and crop growth, and even generate a record of the journey of the plant after it leaves the farm.

**Blockchain Technology**

Databases are currently using ICT (information and communication technology) to track data and manage information flow. The use of blockchain technology to power these databases is a novel concept. They distribute privileges to all network members rather than having a single server and administrator. Multiple parties can then access and validate new database additions, increasing security and lowering the risk of corruption.

**Uses of Blockchain Technologies in Agriculture**

Blockchain technologies can track all types of information about plants, such as seed  quality, and crop growth, and even generate a record of the journey of the plant after it leaves the farm. This data can improve supply chain transparency and eliminate concerns associated with illegal and unethical operations. In the case of a recall, they can also make it easier to track any contamination or other issues back to their source. The primary goals of these technologies are sustainability and food security. When consumers have this amount of transparency, they can make informed purchasing decisions. They frequently utilize this information to reward farmers and producers that implement good farming methods

Why is blockchain important in agriculture

Blockchain agriculture enables the traceability of information in the food supply chain to improve food safety. Blockchain's ability to store and manage data creates traceability, which is used to facilitate the development and use of innovations for intelligent farming and index-based agriculture insurance.

Blockchain benefits agriculture and food industry in future

Blockchain-based traceability systems can help FCS operators to optimize large-scale food supply chains. FCS can employ a consensus process with blockchain to store transaction data and improve food integrity, food safety, and smart farming.

Future of blockchain in agriculture  
  
 The future of blockchain in the supply chain can be very handy here. Utilizing a blockchain ledger system, it can rapidly address all of the components and diminish the costing of the farming cycles and increase the yield's overall efficiency.

CODING

pragma solidity ^0.4.21;

contract Agri{

struct Farmer{

string farmerId;

string farmerName;

}

struct ExpectedYields{

string landLocation;

string crop;

uint256 quantity;

uint256 expectedPrice;

string expDate;

}

struct deal{

address farmer;

address customer;

string terms;

uint256 amount;

uint256 holdingPercent;

}

mapping(address => Farmer) farmerMap;

mapping(address => uint256) customerAddressToIdMap;

mapping(address => deal) dealMapping;

mapping(address => ExpectedYields) farmerYields;

mapping(address => string) farmerAddressToYieldMapping;

mapping(string => ExpectedYields) yieldIdToExpectedYieldMapping;

mapping(string => string) dealIdToYieldId;

mapping(string => deal) stringToDealMapping;

mapping(string => address) farmerIdToAddressMapping;

event farmerAdded(address farmer,string farmerId);

event produceAdded(string farmerId,string crop,uint256 expectedPrice,string expDate);

event rechargeWallet(address customer,uint256 amount);

function addFarmer(address farmer,string memory farmerId) public {

farmerIdToAddressMapping[farmerId] = farmer;

emit farmerAdded(farmer,farmerId);

}

function addProduce(string memory farmerId,string memory yieldId,

string memory landLocation,

string memory crop,

uint256 quantity,

string memory expDate,

uint256 expectedPrice

) public {

ExpectedYields memory farmYield;

farmYield.landLocation = landLocation;

farmYield.crop = crop;

farmYield.quantity = quantity;

farmYield.expectedPrice = expectedPrice;

farmYield.expDate = expDate;

farmerYields[farmerIdToAddressMapping[farmerId]] = farmYield;

yieldIdToExpectedYieldMapping[yieldId] = farmYield;

farmerAddressToYieldMapping[farmerIdToAddressMapping[farmerId]] = yieldId;

// farmerYields[farmerIdToAddressMapping[farmerId]].push(farmYield);

emit produceAdded(farmerId,crop,expectedPrice,expDate);

}

function getProduce(string memory farmerId) public view returns(

string memory expDate,

uint256 quantity,

uint256 expectedPrice

){

expDate = farmerYields[farmerIdToAddressMapping[farmerId]].expDate;

quantity = farmerYields[farmerIdToAddressMapping[farmerId]].quantity;

expectedPrice = farmerYields[farmerIdToAddressMapping[farmerId]].expectedPrice;

}