AGRICULTURAL FARM MANAGEMENT DATABASE

TEB1103: DATA AND INFORMATION MANAGEMENT GROUP ASSIGNMENT

Final Report

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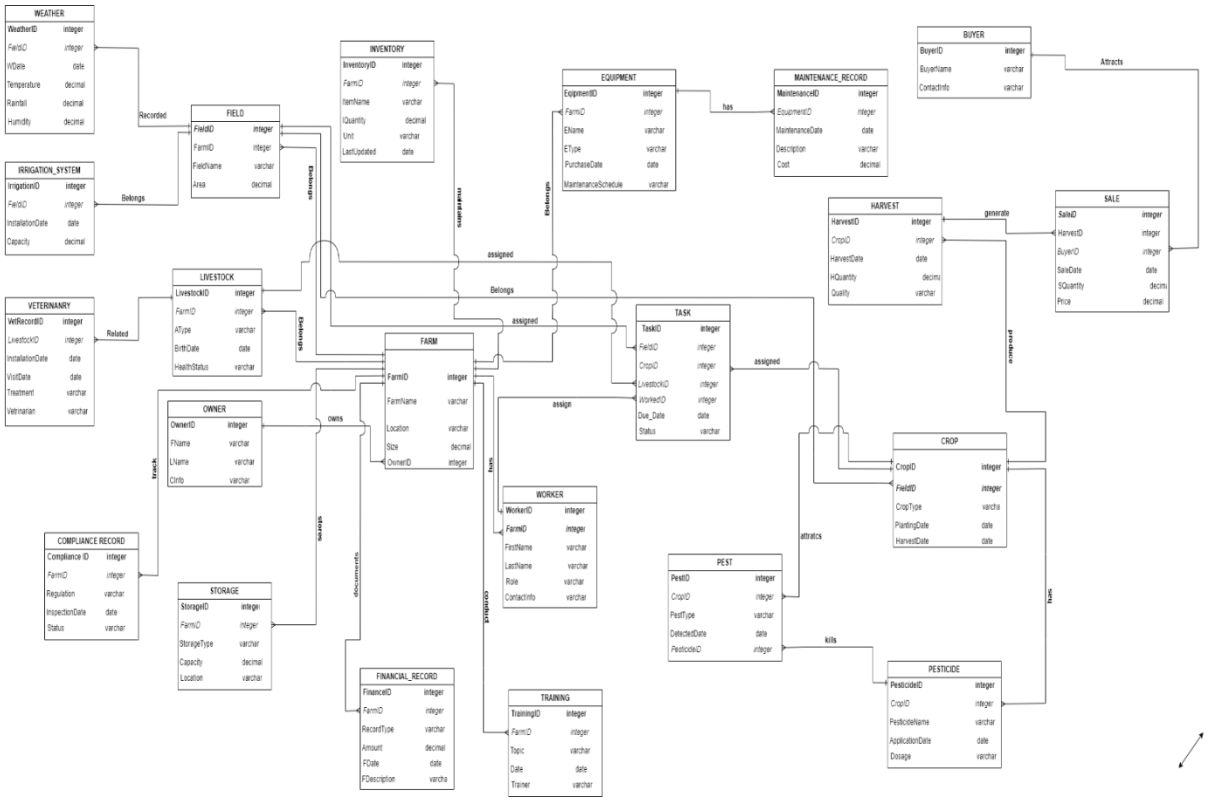
Database Idea

The Agricultural Farm Management Database System in Malaysia integrates the use of technological support for agriculture, for example paddy, corn, tomato, and livestock farming such as goats, cattle, and more. The major functions include increasing food production rates, and meeting the country's food demands at national levels. In addition, specific functionalities of the system include monitoring of different kinds of crops, the details and tools for growing different crop varieties to suit the Malaysian climate. Other roles will include monitoring of the weather for planting and harvesting time, documenting of farm implementation and their maintenance, monitoring of labour force and productivity, serve as a central control for all crops.

At present, some of the threats that are associated with Malaysian farming include the following: Many of the farmers lack access to modern techniques. Many farmers have limitations in controlling productivity of the crops. On some occasions, there is limitations in determining yields from the crops due to volatile climatic conditions, pests, and diseases as well as issues with the land. The Agricultural Farm Management Database System will tackle the former by emphasizing effective production, bolstering data collection as a means for planning, and aiding in the prevention of difficulties through environmentally friendly sustainable measures to sustain production to food security.

ERD Diagram



Relational Database Schema

1. FARM (FarmID , FarmName, Location, Size, OwnerID)

2. OWNER (OwnerID , FName, LName, CInfo)

3. FIELD (FieldID , FarmID , FieldName, Area)

4. CROP (CropID, FieldID, CropType, PlantingDate, HarvestDate)

5. LIVESTOCK (LivestockID , FarmID , AType, BirthDate, HealthStatus)

6. EQUIPMENT (EquipmentID, FarmID , EName, EType, PurchaseDate, MaintenanceSchedule)

7. WORKER (WorkerID, FarmID , FirstName, LastName, Role, ContactInfo)

8. TASK (TaskID , FieldID , CropID , LivestockID, Description, WorkerID, Due_Date, Status)

9. IRRIGATION_SYSTEM (IrrigationID , FieldID, InstallationDate, Capacity)

10. PEST (PestID, CropID, PestType, DetectedDate, PesticideID)

11. PESTICIDE (PesticideID, CropID, PesticideName, ApplicationDate, Dosage)

12. WEATHER (WeatherID, FieldID, WDate, Temperature, Rainfall, Humidity)

13. HARVEST (HarvestID, CropID, HarvestDate, HQuantity, Quality)

14. SALE (SaleID, HarvestID, BuyerID, SaleDate, SQuantity, Price)

15. BUYER (BuyerID , BuyerName, ContactInfo)

16. STORAGE (StorageID, FarmID, StorageType, Capacity, Location)

17. INVENTORY (InventoryID, FarmID, ItemName, Quantity, Unit, LastUpdated)

18. VETERINARY (VetRecordID, LivestockID, VisitDate, Treatment, Veterinarian)

19. FINANCIAL_RECORD (FinanceID, FarmID, RecordType (Income/Expense), Amount, FDate, FDescription)

20.MAINTENANCE_RECORD (MaintenanceID, EquipmentID, MaintenanceDate, MDescription, Cost)

21. TRAINING (TrainingID, FarmID, Topic, Date, Trainer)

22.COMPLIANCE_RECORD (ComplianceID, FarmID, Regulation, InspectionDate, Status)

Data Dictionary

Table: BUYER

Column name	Data type	Length	Constraint	Description
BuyerID	int	11	Primary Key, Not null	Unique identifier for buyer
BuyerName	varchar	255		Name of buyer
ContactInfo	varchar	255		Contact info of buyer

Table:COMPLIANCE_RECORD

Column name	Data type	Length	Constraint	Description
ComplianceID	int	11	Primary Key, Not null	Unique identifier for compliance record
FarmID	int	11	Foreign Key	Unique identifier for farm
Regulation	varchar	255		Types of regulation
InspectionDate	date			Date of Inspection
Status	varchar	255		Status of compliance

Table: CROP

Column name	Data type	Length	Constraint	Description
CropID	int	11	Primary Key, Not null	Unique identifier for Crop
FieldID	int	11	Foreign Key	Unique identifier for field where crop is at
CropType	varchar	255		Type of crop
PlantingDate	date			Date crop was/will be planted
HarvestDate	date			Date crop was/will be harvested

Table: EQUIPMENT

Column name	Data type	Length	Constraint	Description
EquipmentID	int	11	Primary Key, Not null	Unique Identifier for equipment
FarmID	int	11	Foreign Key	Unique identifier for farm
EName	varchar	255		Name of equipment
EType	varchar	255		Type of Equipment
PurchaseDate	date			Date equipment was purchased
MaintenanceSchedule	varchar	255		When equipment should be maintained

Table: FARM

Column name	Data type	Length	Constraint	Description
FarmID	int	11	Primary Key, Not null	Unique identifier for farm
FarmName	varchar	255		Name of farm
Location	varchar	255		Location of farm
Size	decimal	(10,0)		Size/Capacity of farm
OwnerID	date		Foreign Key	Unique identifier for Owner

Table: FIELD

Column name	Data type	Length	Constraint	Description
FieldID	int	11	Primary Key, Not null	Unique identifier for field
FarmID	int	11	Foreign Key	Unique identifier for farm
FieldName	varchar	255		Name of field

Area	decimal	(10,0)		Size/Capacity/Area of field

Table:FINANCIAL_RECORD

Column name	Data type	Length	Constraint	Description
FinanceID	int	11	Primary Key, Not null	Unique identifier for finance record
FarmID	int	11	Foreign Key	Unique identifier for farm
RecordType	varchar	255		Type of record/transaction
Amount	decimal	(10,0)		Transaction amount
FDate	date			Date transaction was made
FDescription	varchar	255		Transaction details

Table: HARVEST

Column name	Data type	Length	Constraint	Description
HarvestID	int	11	Primary Key, Not null	Unique identifier for harvest
CropID	int	11	Foreign Key	Unique identifier for crop
HarvestDate	date			Date harvested
HQuantity	decimal	(10,0)		Quantity of harvest
Quality	varchar	255		Quality of harvest

Table: INVENTORY

Column name	Data type	Length	Constraint	Description
InventoryID	int	11	Primary Key, Not null	Unique identifier for inventory
FarmID	int	11	Foreign Key	Unique identifier for farm
ItemName	varchar	255		Name of item in inventory

IQuantity	decimal	(10,0)		Quantity of item
Unit	varchar	255		Unit stored in
LastUpdated	date			Last inventory update

Table: IRRIGATION_SYSTEM

Column name	Data type	Length	Constraint	Description
IrrigationID	int	11	Primary Key, Not null	Unique identifier for irrigation system
FieldID	int	11	Foreign Key	Unique identifier for field
InstallationDate	date			Date irrigation system was installed
Capacity	decimal	(10,0)		Irrigation system capacity

Table: LIVESTOCK

Column name	Data type	Length	Constraint	Description
LivestockID	int	11	Primary Key, Not null	Unique identifier for livestock
FarmID	int	11	Foreign Key	Unique identifier for farm
AType	varchar	255		Type of animal
BirthDate	date			Date of animal's birth
HealthStatus	varchar	255		Status of animal’s health

Table: MAINTENANCE_RECORD

Column name	Data type	Length	Constraint	Description
MaintenanceID	int	11	Primary Key, Not null	Unique identifier for maintenance
EquipmentID	int	11	Foreign Key	Unique identifier for equipment

MaintenanceDate	date			Date of maintenance
MDescription	varchar	255		Details of maintenance
Cost	decimal	(10,0)		Cost of maintenance

Table: OWNER

Column name	Data type	Length	Constraint	Description
OwnerID	int	11	Primary Key, Not null	Unique identifier for owner
FirstName	varchar	255		First name of owner
LastName	varchar	255		Last name of owner
ContactInfo	varchar	255		Contact info of owner

Table: PEST

Column name	Data type	Length	Constraint	Description
PestID	int	11	Primary Key, Not null	Unique identifier for pest
CropID	int	11	Foreign Key	Unique identifier for crop affected by pests
PestType	varchar	255		Type of pest
DetectedDate	date			Date pests were detected
PesticideID	int	11	Foreign Key	Unique identifier for pesticides

Table: PESTICIDE

Column name	Data type	Length	Constraint	Description
PesticideID	int	11	Primary Key, Not null	Unique identifier for pesticide

CropID	int	11	Foreign Key	Unique identifier for crop pesticide was used on
PesticideName	varchar	255		Name of pesticide
ApplicationDate	date			Date pesticide was used
Dosage	varchar	255		How much pesticide was used

Table: SALE

Column name	Data type	Length	Constraint	Description
SaleID	int	11	Primary Key, Not null	Unique identifier for sales
HarvestID	int	11	Foreign Key	Unique identifier for harvest sold
BuyerID	int	11	Foreign Key	Unique identifier for buyer harvest was sold to
SaleDate	date			Date sale was made
SQuantity	decimal	(10,0)		How much was sold
Price	decimal	(10,0)		Price at which harvest was sold

Table: STORAGE

Column name	Data type	Length	Constraint	Description
StorageID	int	11	Primary Key, Not null	Unique identifier for storage space
FarmID	int	11	Foreign Key	Unique identifier for farm that uses the storage
StorageType	varchar	255		Type of storage
Capacity	decimal	(10,0)		Capacity of storage

Location	varchar	255		Location of storage

Table: TASK

Column name	Data type	Length	Constraint	Description
TaskID	int	11	Primary Key, Not null	Unique identifier for task
FieldID	int	11	Foreign Key	Unique identifier for farm task is done on
CropID	int	11	Foreign Key	Unique identifier for crop task is done on
LivestockID	int	11	Foreign Key	Unique identifier for animal task is done on
Description	varchar	255		Description of the task
WorkerID	int	11	Foreign Key	Unique identifier for the worker that does task
DueDate	date			Date task is due to be finished
Status	varchar	255		Status of task's completion

Table: TRAINING

Column name	Data type	Length	Constraint	Description
TrainingID	int	11	Primary Key, Not null	Unique identifier for training
FarmID	int	11	Foreign Key	Unique identifier for farm training is done on
Topic	varchar	255		Training topic
Date	date			Date training was done
Trainer	varchar	255		Name of trainer who conducted training

Table: VETERINARY

Column name	Data type	Length	Constraint	Description
VetRecordID	int	11	Primary Key, Not null	Unique identifier for vet visits
LivestockID	int	11	Foreign Key	Unique identifier for livestock that visisted the vet
VisitDate	date			Date of visit
Treatment	varchar	255		Details of treatment
Veterinarian	varchar	255		Veterinarian in charge

Table: WEATHER

Column name	Data type	Length	Constraint	Description
WeatherID	int	11	Primary Key, Not null	Unique identifier for weather
FieldID	int	11	Foreign Key	Unique identifier for field affected by weather
WDate	date			Date of weather change
Temperature	decimal	(10,0)		Temperature during weather change
Rainfall	decimal	(10,0)		Amount of rainfall
Humidity	decimal	(10,0)		Amount of humidity

Table: WORKER

Column name	Data type	Length	Constraint	Description
WorkerID	int	11	Primary Key, Not null	Unique identifier for worker
FarmID	int	11	Foreign Key	Unique identifier for farm where worker works at
FirstName	varchar	255		First name of worker
LastName	varchar	255		Last name of worker

Role	varchar	255		Role of worker
ContactInfo	varchar	255		Contact info of worker

Queries

CREATION OF TABLES

TABLE	SQL CODE
OWNER	CREATE TABLE OWNER (OwnerID INT PRIMARY KEY, FName VARCHAR(100), LName VARCHAR(100), CInfo VARCHAR(100));
FARM	CREATE TABLE FARM (FarmID INT PRIMARY KEY, FarmName VARCHAR(100), Location VARCHAR(100), FSize DECIMAL(10, 2), OwnerID INT, FOREIGN KEY (OwnerID) REFERENCES OWNER(OwnerID));
FIELD	CREATE TABLE FIELD (FieldID INT PRIMARY KEY, FarmID INT, FieldName VARCHAR(100), FArea DECIMAL(10, 2), FOREIGN KEY (FarmID) REFERENCES FARM(FarmID));
CROP	CREATE TABLE CROP (CropID INT PRIMARY KEY, FieldID INT, CropType VARCHAR(100), CPlantingDate DATE, CHarvestDate DATE, FOREIGN KEY (FieldID) REFERENCES FIELD(FieldID));
PESTICIDE	CREATE TABLE PESTICIDE (PesticideID INT PRIMARY KEY, PesticideName VARCHAR(100), PApplicationDate DATE, Dosage VARCHAR(100));
PEST	CREATE TABLE PEST (PestID INT PRIMARY KEY, CropID INT, PestType VARCHAR(100), PDetectedDate DATE, PesticideID INT,

	FOREIGN KEY (CropID) REFERENCES CROP(CropID), FOREIGN KEY (PesticideID) REFERENCES PESTICIDE(PesticideID));
LIVESTOCK	CREATE TABLE LIVESTOCK (LivestockID INT PRIMARY KEY, FarmID INT, AType VARCHAR(100), LBirthDate DATE, HealthStatus VARCHAR(100), FOREIGN KEY (FarmID) REFERENCES FARM(FarmID));
EQUIPMENT	CREATE TABLE EQUIPMENT (EquipmentID INT PRIMARY KEY, FarmID INT, EName VARCHAR(100), EType VARCHAR(100), EPurchaseDate DATE, MaintenanceSchedule VARCHAR(100), FOREIGN KEY (FarmID) REFERENCES FARM(FarmID));
WORKER	CREATE TABLE WORKER (WorkerID INT PRIMARY KEY, FarmID INT, FirstName VARCHAR(100), LastName VARCHAR(100), Role VARCHAR(100), ContactInfo VARCHAR(100), FOREIGN KEY (FarmID) REFERENCES FARM(FarmID));
TASK	CREATE TABLE TASK (TaskID INT PRIMARY KEY, FieldID INT, CropID INT, LivestockID INT, Description VARCHAR(255), WorkerID INT, TDueDate DATE, Status VARCHAR(100), FOREIGN KEY (FieldID) REFERENCES FIELD(FieldID), FOREIGN KEY (CropID) REFERENCES CROP(CropID), FOREIGN KEY (LivestockID) REFERENCES LIVESTOCK(LivestockID), FOREIGN KEY (WorkerID) REFERENCES WORKER(WorkerID));
IRRIGATION_SYSTEM	CREATE TABLE IRRIGATION_SYSTEM (

	IrrigationID INT PRIMARY KEY, FieldID INT, IInstallationDate DATE, ICapacity DECIMAL(10, 2), FOREIGN KEY (FieldID) REFERENCES FIELD(FieldID));
WEATHER	CREATE TABLE WEATHER (WeatherID INT PRIMARY KEY, FieldID INT, WDate DATE, Temperature DECIMAL(5, 2), Rainfall DECIMAL(5, 2), Humidity DECIMAL(5, 2), FOREIGN KEY (FieldID) REFERENCES FIELD(FieldID));
HARVEST	CREATE TABLE HARVEST (HarvestID INT PRIMARY KEY, CropID INT, HHarvestDate DATE, Quantity DECIMAL(10, 2), Quality VARCHAR(100), FOREIGN KEY (CropID) REFERENCES CROP(CropID));
BUYER	CREATE TABLE BUYER (BuyerID INT PRIMARY KEY, BuyerName VARCHAR(100), ContactInfo VARCHAR(100));
SALE	CREATE TABLE SALE (SaleID INT PRIMARY KEY, HarvestID INT, BuyerID INT, SDate DATE, Quantity DECIMAL(10, 2), Price DECIMAL(10, 2), FOREIGN KEY (HarvestID) REFERENCES HARVEST(HarvestID), FOREIGN KEY (BuyerID) REFERENCES BUYER(BuyerID));
STORAGE	CREATE TABLE STORAGE (StorageID INT PRIMARY KEY, FarmID INT, StorageType VARCHAR(100), SCapacity DECIMAL(10, 2), Location VARCHAR(100), FOREIGN KEY (FarmID) REFERENCES FARM(FarmID));

INVENTORY	CREATE TABLE INVENTORY (InventoryID INT PRIMARY KEY, FarmID INT, ItemName VARCHAR(100), Quantity DECIMAL(10, 2), Unit VARCHAR(100), ILastUpdated DATE, FOREIGN KEY (FarmID) REFERENCES FARM(FarmID));
VETERINARY	CREATE TABLE VETERINARY (VetRecordID INT PRIMARY KEY, LivestockID INT, VVisitDate DATE, Treatment VARCHAR(255), Veterinarian VARCHAR(100), FOREIGN KEY (LivestockID) REFERENCES LIVESTOCK(LivestockID));
FINANCIAL_RECORD	CREATE TABLE FINANCIAL_RECORD (FinanceID INT PRIMARY KEY, FarmID INT, RecordType VARCHAR(100), Amount DECIMAL(10, 2), FDate DATE, Description VARCHAR(255), FOREIGN KEY (FarmID) REFERENCES FARM(FarmID));
MAINTENANCE_RECORD	CREATE TABLE MAINTENANCE_RECORD (MaintenanceID INT PRIMARY KEY, EquipmentID INT, MDate DATE, Description VARCHAR(255), Cost DECIMAL(10, 2), FOREIGN KEY (EquipmentID) REFERENCES EQUIPMENT(EquipmentID));
TRAINING	CREATE TABLE TRAINING (TrainingID INT PRIMARY KEY, FarmID INT, Topic VARCHAR(100), TDate DATE, Trainer VARCHAR(100), FOREIGN KEY (FarmID) REFERENCES FARM(FarmID));
COMPLIANCE_RECORD	CREATE TABLE COMPLIANCE_RECORD (ComplianceID INT PRIMARY KEY, FarmID INT,

	Regulation VARCHAR(100), CInspectionDate DATE, Status VARCHAR(100), FOREIGN KEY (FarmID) REFERENCES FARM(FarmID));

Output:

```
Table created.

Table created.

Table created.

Table created.
```

POPULATE TABLE WITH DATA (AT LEAST 5)

1. OWNER TABLE

SELECT * FROM OWNER;

INSERT INTO OWNER (OwnerID, FName, LName, CInfo) VALUES (1, 'John', 'Doe', 'john.doe@gmail.com');

INSERT INTO OWNER (OwnerID, FName, LName, CInfo) VALUES (2, 'Jane', 'Smith', 'jane.smith@yahoo.com');

INSERT INTO OWNER (OwnerID, FName, LName, CInfo) VALUES (3, 'Alice', 'Johnson', 'alice.johnson@outlook.com');

INSERT INTO OWNER (OwnerID, FName, LName, CInfo) VALUES (4, 'Robert', 'Brown', 'robert.brown@gmail.com');

INSERT INTO OWNER (OwnerID, FName, LName, CInfo) VALUES (5, 'Maria', 'Garcia', 'maria.garcia@hotmail.com');

SELECT * FROM OWNER;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

OWNERID	FNAME	LNAME	CINFO
1	John	Doe	john.doe@gmail.com
2	Jane	Smith	jane.smith@yahoo.com
3	Alice	Johnson	alice.johnson@outlook.com
4	Robert	Brown	robert.brown@gmail.com
5	Maria	Garcia	maria.garcia@hotmail.com

2. FARM TABLE:

SELECT * FROM FARM;

INSERT INTO FARM (FarmID, FarmName, Location, FSize, OwnerID) VALUES (1, 'Green Acres', 'Springfield', 150.5, 1);

INSERT INTO FARM (FarmID, FarmName, Location, FSize, OwnerID) VALUES (2, 'Sunny Fields', 'Shelbyville', 200.0, 2);

INSERT INTO FARM (FarmID, FarmName, Location, FSize, OwnerID) VALUES (3, 'Happy Farm', 'Ogdenville', 120.0, 3);

INSERT INTO FARM (FarmID, FarmName, Location, FSize, OwnerID) VALUES (4, 'Farm Fresh', 'North Haverbrook', 180.0, 4);

INSERT INTO FARM (FarmID, FarmName, Location, FSize, OwnerID) VALUES (5, 'Golden Harvest', 'Capital City', 250.0, 5);

SELECT * FROM FARM;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

FARMID	FARMNAME	LOCATION	FSIZE	OWNERID
1	Green Acres	Springfield	150.5	1
2	Sunny Fields	Shelbyville	200	2
3	Happy Farm	Ogdenville	120	3
4	Farm Fresh	North Haverbrook	180	4
5	Golden Harvest	Capital City	250	5

3. FIELD TABLE:

SELECT * FROM FIELD;

INSERT INTO FIELD (FieldID, FarmID, FieldName, FArea) VALUES (1, 1, 'Field A', 50.5);

INSERT INTO FIELD (FieldID, FarmID, FieldName, FArea) VALUES (2, 1, 'Field B', 60.0);

INSERT INTO FIELD (FieldID, FarmID, FieldName, FArea) VALUES (3, 2, 'Field C', 70.0);

INSERT INTO FIELD (FieldID, FarmID, FieldName, FArea) VALUES (4, 2, 'Field D', 80.0);

INSERT INTO FIELD (FieldID, FarmID, FieldName, FArea) VALUES (5, 3, 'Field E', 90.0);

SELECT * FROM FIELD;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

FIELDID	FARMID	FIELDNAME	FAREA
1	1	Field A	50.5
2	1	Field B	60
3	2	Field C	70
4	2	Field D	80
5	3	Field E	90

4. CROP TABLE:

SELECT * FROM CROP;

INSERT INTO CROP (CropID, FieldID, CropType, CPlantingDate, CHarvestDate) VALUES (1, 1, 'Wheat', DATE '2023-03-01', DATE '2023-07-15');

INSERT INTO CROP (CropID, FieldID, CropType, CPlantingDate, CHarvestDate) VALUES (2, 2, 'Corn', DATE '2023-04-01', DATE '2023-08-20');

INSERT INTO CROP (CropID, FieldID, CropType, CPlantingDate, CHarvestDate) VALUES (3, 3, 'Barley', DATE '2023-05-01', DATE '2023-09-25');

INSERT INTO CROP (CropID, FieldID, CropType, CPlantingDate, CHarvestDate) VALUES (4, 4, 'Soybeans', DATE '2023-06-01', DATE '2023-10-30');

INSERT INTO CROP (CropID, FieldID, CropType, CPlantingDate, CHarvestDate) VALUES (5, 5, 'Rice', DATE '2023-07-01', DATE '2023-11-15');

SELECT * FROM CROP;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

CROPID	FIELDID	CROPTYPE	CPLANTINGDATE	CHARVESTDATE
1	1	Wheat	01-MAR-23	15-JUL-23
2	2	Corn	01-APR-23	20-AUG-23
3	3	Barley	01-MAY-23	25-SEP-23
4	4	Soybeans	01-JUN-23	30-OCT-23
5	5	Rice	01-JUL-23	15-NOV-23

5. PESTICIDE TABLE:

SELECT * FROM PESTICIDE;

INSERT INTO PESTICIDE (PesticideID, PesticideName, PApplicationDate, Dosage) VALUES (1, 'RoundUp', DATE '2023-05-15', '2L/ha');

INSERT INTO PESTICIDE (PesticideID, PesticideName, PApplicationDate, Dosage) VALUES (2, 'Sevin', DATE '2023-06-01', '1.5kg/ha');

INSERT INTO PESTICIDE (PesticideID, PesticideName, PApplicationDate, Dosage) VALUES (3, 'Malathion', DATE '2023-06-15', '1L/ha');

INSERT INTO PESTICIDE (PesticideID, PesticideName, PApplicationDate, Dosage) VALUES (4, 'Neem Oil', DATE '2023-07-01', '3L/ha');

INSERT INTO PESTICIDE (PesticideID, PesticideName, PApplicationDate, Dosage) VALUES (5, 'Bt spray', DATE '2023-07-15', '500g/ha');

SELECT * FROM PESTICIDE;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

PESTICIDEID	PESTICIDENAME	PAPPLICATIONDATE	DOSAGE
1	RoundUp	15-MAY-23	2L/ha
2	Sevin	01-JUN-23	1.5kg/ha
3	Malathion	15-JUN-23	1L/ha
4	Neem Oil	01-JUL-23	3L/ha
5	Bt spray	15-JUL-23	500g/ha

6. PEST TABLE:

SELECT * FROM PEST;

INSERT INTO PEST (PestID, CropID, PestType, PDetectedDate, PesticideID) VALUES (1, 1, 'Aphids', DATE '2023-05-10', 1);

INSERT INTO PEST (PestID, CropID, PestType, PDetectedDate, PesticideID) VALUES (2, 2, 'Corn Borer', DATE '2023-06-05', 2);

INSERT INTO PEST (PestID, CropID, PestType, PDetectedDate, PesticideID) VALUES (3, 3, 'Grasshoppers', DATE '2023-06-20', 3);

INSERT INTO PEST (PestID, CropID, PestType, PDetectedDate, PesticideID) VALUES (4, 4, 'Spider Mites', DATE '2023-07-05', 4);

INSERT INTO PEST (PestID, CropID, PestType, PDetectedDate, PesticideID) VALUES (5, 5, 'Rice Weevil', DATE '2023-07-20', 5);

SELECT * FROM PEST;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

PESTID	CROPID	PESTTYPE	PDETECTEDDATE	PESTICIDEID
1	1	Aphids	10-MAY-23	1
2	2	Corn Borer	05-JUN-23	2
3	3	Grasshoppers	20-JUN-23	3
4	4	Spider Mites	05-JUL-23	4
5	5	Rice Weevil	20-JUL-23	5

7. LIVESTOCK TABLE:

SELECT * FROM LIVESTOCK;

INSERT INTO LIVESTOCK (LivestockID, FarmID, AType, LBirthDate, HealthStatus)
VALUES (1, 1, 'Cattle', DATE '2021-01-15', 'Healthy');

INSERT INTO LIVESTOCK (LivestockID, FarmID, AType, LBirthDate, HealthStatus)
VALUES (2, 1, 'Sheep', DATE '2021-02-20', 'Healthy');

INSERT INTO LIVESTOCK (LivestockID, FarmID, AType, LBirthDate, HealthStatus)
VALUES (3, 2, 'Goat', DATE '2021-03-25', 'Healthy');

INSERT INTO LIVESTOCK (LivestockID, FarmID, AType, LBirthDate, HealthStatus)
VALUES (4, 2, 'Pig', DATE '2021-04-30', 'Healthy');

INSERT INTO LIVESTOCK (LivestockID, FarmID, AType, LBirthDate, HealthStatus)
VALUES (5, 3, 'Chicken', DATE '2021-05-05', 'Healthy');

SELECT * FROM LIVESTOCK;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

LIVESTOCKID	FARMID	ATYPE	LBIRTHDATE	HEALTHSTATUS
1	1	Cattle	15-JAN-21	Healthy
2	1	Sheep	20-FEB-21	Healthy
3	2	Goat	25-MAR-21	Healthy
4	2	Pig	30-APR-21	Healthy
5	3	Chicken	05-MAY-21	Healthy

8. EQUIPMENT TABLE:

SELECT * FROM EQUIPMENT;

INSERT INTO EQUIPMENT (EquipmentID, FarmID, EName, EType, EPurchaseDate, MaintenanceSchedule) VALUES (1, 1, 'Tractor', 'Vehicle', DATE '2022-01-01', 'Quarterly');

INSERT INTO EQUIPMENT (EquipmentID, FarmID, EName, EType, EPurchaseDate, MaintenanceSchedule) VALUES (2, 1, 'Plow', 'Tool', DATE '2022-02-01', 'Yearly');

INSERT INTO EQUIPMENT (EquipmentID, FarmID, EName, EType, EPurchaseDate, MaintenanceSchedule) VALUES (3, 2, 'Harvester', 'Machine', DATE '2022-03-01', 'Monthly');

INSERT INTO EQUIPMENT (EquipmentID, FarmID, EName, EType, EPurchaseDate, MaintenanceSchedule) VALUES (4, 2, 'Sprinkler', 'Irrigation', DATE '2022-04-01', 'Monthly');

INSERT INTO EQUIPMENT (EquipmentID, FarmID, EName, EType, EPurchaseDate, MaintenanceSchedule) VALUES (5, 3, 'Seeder', 'Machine', DATE '2022-05-01', 'Quarterly');

SELECT * FROM EQUIPMENT;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

EQUIPMENTID	FARMID	ENAME	ETYPE	EPURCHASEDATE	MAINTENANCESCHEDULE
1	1	Tractor	Vehicle	01-JAN-22	Quarterly
2	1	Plow	Tool	01-FEB-22	Yearly
3	2	Harvester	Machine	01-MAR-22	Monthly
4	2	Sprinkler	Irrigation	01-APR-22	Monthly
5	3	Seeder	Machine	01-MAY-22	Quarterly

9. WORKER TABLE:

SELECT * FROM WORKER;

INSERT INTO WORKER (WorkerID, FarmID, FirstName, LastName, Role, ContactInfo)
VALUES (1, 1, 'Mike', 'Johnson', 'Farm Manager', 'mike.johnson@gmail.com');

INSERT INTO WORKER (WorkerID, FarmID, FirstName, LastName, Role, ContactInfo)
VALUES (2, 1, 'Sarah', 'Williams', 'Field Worker', 'sarah.williams@yahoo.com');

INSERT INTO WORKER (WorkerID, FarmID, FirstName, LastName, Role, ContactInfo)
VALUES (3, 2, 'James', 'Jones', 'Livestock Handler', 'james.jones@outlook.com');

INSERT INTO WORKER (WorkerID, FarmID, FirstName, LastName, Role, ContactInfo)
VALUES (4, 2, 'Linda', 'Brown', 'Equipment Operator', 'linda.brown@gmail.com');

INSERT INTO WORKER (WorkerID, FarmID, FirstName, LastName, Role, ContactInfo)
VALUES (5, 3, 'Tom', 'Davis', 'Farm Manager', 'tom.davis@hotmail.com');

SELECT * FROM WORKER;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

WORKERID	FARMID	FIRSTNAME	LASTNAME	ROLE	CONTACTINFO
1	1	Mike	Johnson	Farm Manager	mike.johnson@gmail.com
2	1	Sarah	Williams	Field Worker	sarah.williams@yahoo.com
3	2	James	Jones	Livestock Handler	james.jones@outlook.com
4	2	Linda	Brown	Equipment Operator	linda.brown@gmail.com
5	3	Tom	Davis	Farm Manager	tom.davis@hotmail.com

10. TASK TABLE:

SELECT * FROM TASK;

INSERT INTO TASK (TaskID, FieldID, CropID, LivestockID, Description, WorkerID, TDueDate, Status) VALUES (1, 1, 1, NULL, 'Plant wheat', 2, DATE '2023-03-02', 'Completed');

INSERT INTO TASK (TaskID, FieldID, CropID, LivestockID, Description, WorkerID, TDueDate, Status) VALUES (2, 2, 2, NULL, 'Harvest corn', 2, DATE '2023-08-21', 'Pending');

INSERT INTO TASK (TaskID, FieldID, CropID, LivestockID, Description, WorkerID, TDueDate, Status) VALUES (3, NULL, NULL, 1, 'Check cattle health', 3, DATE '2023-07-10', 'Completed');

INSERT INTO TASK (TaskID, FieldID, CropID, LivestockID, Description, WorkerID, TDueDate, Status) VALUES (4, 3, 3, NULL, 'Plant barley', 4, DATE '2023-05-02', 'Completed');

INSERT INTO TASK (TaskID, FieldID, CropID, LivestockID, Description, WorkerID, TDueDate, Status) VALUES (5, NULL, NULL, 2, 'Shear sheep', 3, DATE '2023-06-01', 'Pending');

SELECT * FROM TASK;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

TASKID	FIELDID	CROPID	LIVESTOCKID	DESCRIPTION	WORKERID	TDUEDATE	STATUS
1	1	1	-	Plant wheat	2	02-MAR-23	Completed
2	2	2	-	Harvest corn	2	21-AUG-23	Pending
3	-	-	1	Check cattle health	3	10-JUL-23	Completed
4	3	3	-	Plant barley	4	02-MAY-23	Completed
5	-	-	2	Shear sheep	3	01-JUN-23	Pending

11. IRRIGATION SYSTEM:

```
SELECT * FROM IRRIGATION_SYSTEM;

INSERT INTO IRRIGATION_SYSTEM (IrrigationID, FieldID, IInstallationDate, ICapacity)
VALUES (1, 1, DATE '2022-03-01', 100.0);

INSERT INTO IRRIGATION_SYSTEM (IrrigationID, FieldID, IInstallationDate, ICapacity)
VALUES (2, 2, DATE '2022-04-01', 200.0);

INSERT INTO IRRIGATION_SYSTEM (IrrigationID, FieldID, IInstallationDate, ICapacity)
VALUES (3, 3, DATE '2022-05-01', 150.0);

INSERT INTO IRRIGATION_SYSTEM (IrrigationID, FieldID, IInstallationDate, ICapacity)
VALUES (4, 4, DATE '2022-06-01', 180.0);

INSERT INTO IRRIGATION_SYSTEM (IrrigationID, FieldID, IInstallationDate, ICapacity)
VALUES (5, 5, DATE '2022-07-01', 220.0);

SELECT * FROM IRRIGATION_SYSTEM;
```

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

IRRIGATIONID	FIELDID	IINSTALLATIONDATE	ICAPACITY
1	1	01-MAR-22	100
2	2	01-APR-22	200
3	3	01-MAY-22	150
4	4	01-JUN-22	180
5	5	01-JUL-22	220

12. WEATHER TABLE:

```
SELECT * FROM WEATHER;

INSERT INTO WEATHER (WeatherID, FieldID, WDate, Temperature, Rainfall, Humidity)
VALUES (1, 1, DATE '2023-07-15', 30.0, 10.0, 60.0);

INSERT INTO WEATHER (WeatherID, FieldID, WDate, Temperature, Rainfall, Humidity)
VALUES (2, 2, DATE '2023-08-20', 28.0, 5.0, 55.0);

INSERT INTO WEATHER (WeatherID, FieldID, WDate, Temperature, Rainfall, Humidity)
VALUES (3, 3, DATE '2023-09-25', 25.0, 15.0, 70.0);

INSERT INTO WEATHER (WeatherID, FieldID, WDate, Temperature, Rainfall, Humidity)
VALUES (4, 4, DATE '2023-10-30', 20.0, 20.0, 80.0);

INSERT INTO WEATHER (WeatherID, FieldID, WDate, Temperature, Rainfall, Humidity)
VALUES (5, 5, DATE '2023-11-15', 18.0, 25.0, 75.0);

SELECT * FROM WEATHER;
```

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

WEATHERID	FIELDID	WDATE	TEMPERATURE	RAINFALL	HUMIDITY
1	1	15-JUL-23	30	10	60
2	2	20-AUG-23	28	5	55
3	3	25-SEP-23	25	15	70
4	4	30-OCT-23	20	20	80
5	5	15-NOV-23	18	25	75

13. HARVEST TABLE:

SELECT * FROM HARVEST;

INSERT INTO HARVEST (HarvestID, CropID, HHarvestDate, Quantity, Quality) VALUES (1, 1, DATE '2023-07-20', 100.0, 'A');

INSERT INTO HARVEST (HarvestID, CropID, HHarvestDate, Quantity, Quality) VALUES (2, 2, DATE '2023-08-25', 150.0, 'B');

INSERT INTO HARVEST (HarvestID, CropID, HHarvestDate, Quantity, Quality) VALUES (3, 3, DATE '2023-09-30', 200.0, 'A');

INSERT INTO HARVEST (HarvestID, CropID, HHarvestDate, Quantity, Quality) VALUES (4, 4, DATE '2023-10-05', 180.0, 'B');

INSERT INTO HARVEST (HarvestID, CropID, HHarvestDate, Quantity, Quality) VALUES (5, 5, DATE '2023-11-20', 220.0, 'A');

SELECT * FROM HARVEST;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

HARVESTID	CROPID	HHARVESTDATE	QUANTITY	QUALITY
1	1	20-JUL-23	100	A
2	2	25-AUG-23	150	B
3	3	30-SEP-23	200	A
4	4	05-OCT-23	180	B
5	5	20-NOV-23	220	A

14. BUYER TABLE:

SELECT * FROM BUYER;

INSERT INTO BUYER (BuyerID, BuyerName, ContactInfo) VALUES (1, 'Acme Corp', 'contact@acmecorp.com');

INSERT INTO BUYER (BuyerID, BuyerName, ContactInfo) VALUES (2, 'Farmers Market', 'info@farmersmarket.com');

INSERT INTO BUYER (BuyerID, BuyerName, ContactInfo) VALUES (3, 'Grocery Store', 'sales@grocerystore.com');

INSERT INTO BUYER (BuyerID, BuyerName, ContactInfo) VALUES (4, 'Local Butcher', 'orders@localbutcher.com');

INSERT INTO BUYER (BuyerID, BuyerName, ContactInfo) VALUES (5, 'Organic Foods', 'support@organicfoods.com');

SELECT * FROM BUYER;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

BUYERID	BUYERNAME	CONTACTINFO
1	Acme Corp	contact@acmecorp.com
2	Farmers Market	info@farmersmarket.com
3	Grocery Store	sales@grocerystore.com
4	Local Butcher	orders@localbutcher.com
5	Organic Foods	support@organicfoods.com

15. SALE TABLE:

SELECT * FROM SALE;

INSERT INTO SALE (SaleID, HarvestID, BuyerID, SDate, Quantity, Price) VALUES (1, 1, 1, DATE '2023-07-25', 100.0, 500.0);

INSERT INTO SALE (SaleID, HarvestID, BuyerID, SDate, Quantity, Price) VALUES (2, 2, 2, DATE '2023-08-30', 150.0, 750.0);

INSERT INTO SALE (SaleID, HarvestID, BuyerID, SDate, Quantity, Price) VALUES (3, 3, 3, DATE '2023-10-01', 200.0, 1000.0);

INSERT INTO SALE (SaleID, HarvestID, BuyerID, SDate, Quantity, Price) VALUES (4, 4, 4, DATE '2023-10-10', 180.0, 900.0);

INSERT INTO SALE (SaleID, HarvestID, BuyerID, SDate, Quantity, Price) VALUES (5, 5, 5, DATE '2023-11-25', 220.0, 1100.0);

SELECT * FROM SALE;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

SALEID	HARVESTID	BUYERID	SDATE	QUANTITY	PRICE
1	1	1	25-JUL-23	100	500
2	2	2	30-AUG-23	150	750
3	3	3	01-OCT-23	200	1000
4	4	4	10-OCT-23	180	900
5	5	5	25-NOV-23	220	1100

16. STORAGE TABLE:

SELECT * FROM STORAGE;

INSERT INTO STORAGE (StorageID, FarmID, StorageType, SCapacity, Location) VALUES (1, 1, 'Silo', 500.0, 'Barn 1');

INSERT INTO STORAGE (StorageID, FarmID, StorageType, SCapacity, Location) VALUES (2, 2, 'Warehouse', 1000.0, 'Warehouse 1');

INSERT INTO STORAGE (StorageID, FarmID, StorageType, SCapacity, Location) VALUES (3, 3, 'Cold Storage', 300.0, 'Cold Room 1');

INSERT INTO STORAGE (StorageID, FarmID, StorageType, SCapacity, Location) VALUES (4, 4, 'Shed', 200.0, 'Shed 1');

INSERT INTO STORAGE (StorageID, FarmID, StorageType, SCapacity, Location) VALUES (5, 5, 'Barn', 600.0, 'Barn 2');

SELECT * FROM STORAGE;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

STORAGEID	FARMID	STORAGETYPE	SCAPACITY	LOCATION
1	1	Silo	500	Barn 1
2	2	Warehouse	1000	Warehouse 1
3	3	Cold Storage	300	Cold Room 1
4	4	Shed	200	Shed 1
5	5	Barn	600	Barn 2

17. INVENTORY TABLE:

SELECT * FROM INVENTORY;

INSERT INTO INVENTORY (InventoryID, FarmID, ItemName, Quantity, Unit, lLastUpdated) VALUES (1, 1, 'Seeds', 100.0, 'kg', DATE '2023-07-01');

INSERT INTO INVENTORY (InventoryID, FarmID, ItemName, Quantity, Unit, lLastUpdated) VALUES (2, 2, 'Fertilizer', 200.0, 'kg', DATE '2023-08-01');

INSERT INTO INVENTORY (InventoryID, FarmID, ItemName, Quantity, Unit, lLastUpdated) VALUES (3, 3, 'Pesticides', 150.0, 'L', DATE '2023-09-01');

INSERT INTO INVENTORY (InventoryID, FarmID, ItemName, Quantity, Unit, lLastUpdated) VALUES (4, 4, 'Animal Feed', 300.0, 'kg', DATE '2023-10-01');

INSERT INTO INVENTORY (InventoryID, FarmID, ItemName, Quantity, Unit, lLastUpdated) VALUES (5, 5, 'Machinery Parts', 50.0, 'units', DATE '2023-11-01');

SELECT * FROM INVENTORY;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

INVENTORYID	FARMID	ITEMNAME	QUANTITY	UNIT	ILASTUPDATED
1	1	Seeds	100	kg	01-JUL-23
2	2	Fertilizer	200	kg	01-AUG-23
3	3	Pesticides	150	L	01-SEP-23
4	4	Animal Feed	300	kg	01-OCT-23
5	5	Machinery Parts	50	units	01-NOV-23

18. VETERINARY TABLE:

SELECT * FROM VETERINARY;

INSERT INTO VETERINARY (VetRecordID, LivestockID, VVisitDate, Treatment, Veterinarian) VALUES (1, 1, DATE '2023-07-05', 'Vaccination', 'Dr. Smith');

INSERT INTO VETERINARY (VetRecordID, LivestockID, VVisitDate, Treatment, Veterinarian) VALUES (2, 2, DATE '2023-07-10', 'Check-up', 'Dr. Jones');

INSERT INTO VETERINARY (VetRecordID, LivestockID, VVisitDate, Treatment, Veterinarian) VALUES (3, 3, DATE '2023-07-15', 'Deworming', 'Dr. Brown');

INSERT INTO VETERINARY (VetRecordID, LivestockID, VVisitDate, Treatment, Veterinarian) VALUES (4, 4, DATE '2023-07-20', 'Vaccination', 'Dr. Wilson');

INSERT INTO VETERINARY (VetRecordID, LivestockID, VVisitDate, Treatment, Veterinarian) VALUES (5, 5, DATE '2023-07-25', 'Check-up', 'Dr. Davis');

SELECT * FROM VETERINARY;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

VETRECORDID	LIVESTOCKID	VVISITDATE	TREATMENT	VETERINARIAN
1	1	05-JUL-23	Vaccination	Dr. Smith
2	2	10-JUL-23	Check-up	Dr. Jones
3	3	15-JUL-23	Deworming	Dr. Brown
4	4	20-JUL-23	Vaccination	Dr. Wilson
5	5	25-JUL-23	Check-up	Dr. Davis

19. FINANCIAL RECORD:

SELECT * FROM FINANCIAL_RECORD;

INSERT INTO FINANCIAL_RECORD (FinanceID, FarmID, RecordType, Amount, FDate, Description) VALUES (1, 1, 'Expense', 1000.0, DATE '2023-01-01', 'Seed purchase');

INSERT INTO FINANCIAL_RECORD (FinanceID, FarmID, RecordType, Amount, FDate, Description) VALUES (2, 2, 'Income', 2000.0, DATE '2023-02-01', 'Crop sale');

INSERT INTO FINANCIAL_RECORD (FinanceID, FarmID, RecordType, Amount, FDate, Description) VALUES (3, 3, 'Expense', 1500.0, DATE '2023-03-01', 'Fertilizer purchase');

INSERT INTO FINANCIAL_RECORD (FinanceID, FarmID, RecordType, Amount, FDate, Description) VALUES (4, 4, 'Income', 2500.0, DATE '2023-04-01', 'Livestock sale');

INSERT INTO FINANCIAL_RECORD (FinanceID, FarmID, RecordType, Amount, FDate, Description) VALUES (5, 5, 'Expense', 500.0, DATE '2023-05-01', 'Machinery maintenance');

SELECT * FROM FINANCIAL_RECORD;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

FINANCEID	FARMID	RECORDTYPE	AMOUNT	FDATE	DESCRIPTION
1	1	Expense	1000	01-JAN-23	Seed purchase
2	2	Income	2000	01-FEB-23	Crop sale
3	3	Expense	1500	01-MAR-23	Fertilizer purchase
4	4	Income	2500	01-APR-23	Livestock sale
5	5	Expense	500	01-MAY-23	Machinery maintenance

20. MAINTENANCE_RECORD TABLE:

SELECT * FROM MAINTENANCE_RECORD;

INSERT INTO MAINTENANCE_RECORD (MaintenanceID, EquipmentID, MDate, Description, Cost) VALUES (1, 1, DATE '2023-03-15', 'Oil change', 100.0);

INSERT INTO MAINTENANCE_RECORD (MaintenanceID, EquipmentID, MDate, Description, Cost) VALUES (2, 2, DATE '2023-04-20', 'Blade sharpening', 50.0);

INSERT INTO MAINTENANCE_RECORD (MaintenanceID, EquipmentID, MDate, Description, Cost) VALUES (3, 3, DATE '2023-05-25', 'Belt replacement', 200.0);

INSERT INTO MAINTENANCE_RECORD (MaintenanceID, EquipmentID, MDate, Description, Cost) VALUES (4, 4, DATE '2023-06-30', 'Nozzle cleaning', 75.0);

INSERT INTO MAINTENANCE_RECORD (MaintenanceID, EquipmentID, MDate, Description, Cost) VALUES (5, 5, DATE '2023-07-05', 'Calibration', 150.0);

SELECT * FROM MAINTENANCE_RECORD;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

MAINTENANCEID	EQUIPMENTID	MDATE	DESCRIPTION	COST
1	1	15-MAR-23	Oil change	100
2	2	20-APR-23	Blade sharpening	50
3	3	25-MAY-23	Belt replacement	200
4	4	30-JUN-23	Nozzle cleaning	75
5	5	05-JUL-23	Calibration	150

21. TRAINING TABLE:

SELECT * FROM TRAINING;

INSERT INTO TRAINING (TrainingID, FarmID, Topic, TDate, Trainer) VALUES (1, 1, 'Crop Rotation', DATE '2023-02-10', 'John Expert');

INSERT INTO TRAINING (TrainingID, FarmID, Topic, TDate, Trainer) VALUES (2, 2, 'Pest Management', DATE '2023-03-15', 'Jane Specialist');

INSERT INTO TRAINING (TrainingID, FarmID, Topic, TDate, Trainer) VALUES (3, 3, 'Irrigation Techniques', DATE '2023-04-20', 'Bob Instructor');

INSERT INTO TRAINING (TrainingID, FarmID, Topic, TDate, Trainer) VALUES (4, 4, 'Livestock Care', DATE '2023-05-25', 'Alice Trainer');

INSERT INTO TRAINING (TrainingID, FarmID, Topic, TDate, Trainer) VALUES (5, 5, 'Farm Safety', DATE '2023-06-30', 'Charlie Educator');

SELECT * FROM TRAINING;

OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

TRAININGID	FARMID	TOPIC	TDATE	TRAINER
1	1	Crop Rotation	10-FEB-23	John Expert
2	2	Pest Management	15-MAR-23	Jane Specialist
3	3	Irrigation Techniques	20-APR-23	Bob Instructor
4	4	Livestock Care	25-MAY-23	Alice Trainer
5	5	Farm Safety	30-JUN-23	Charlie Educator

22. COMPLIANCE RECORD:

SELECT * FROM COMPLIANCE_RECORD;

INSERT INTO COMPLIANCE_RECORD (ComplianceID, FarmID, Regulation, CInspectionDate, Status) VALUES (1, 1, 'Pesticide Use', DATE '2023-03-01', 'Compliant');

INSERT INTO COMPLIANCE_RECORD (ComplianceID, FarmID, Regulation, CInspectionDate, Status) VALUES (2, 2, 'Animal Welfare', DATE '2023-04-05', 'Compliant');

INSERT INTO COMPLIANCE_RECORD (ComplianceID, FarmID, Regulation, CInspectionDate, Status) VALUES (3, 3, 'Water Usage', DATE '2023-05-10', 'Non-Compliant');

INSERT INTO COMPLIANCE_RECORD (ComplianceID, FarmID, Regulation, CInspectionDate, Status) VALUES (4, 4, 'Organic Certification', DATE '2023-06-15', 'Compliant');

INSERT INTO COMPLIANCE_RECORD (ComplianceID, FarmID, Regulation, CInspectionDate, Status) VALUES (5, 5, 'Worker Safety', DATE '2023-07-20', 'Compliant');

SELECT * FROM COMPLIANCE_RECORD;

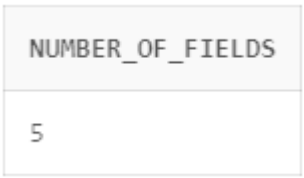
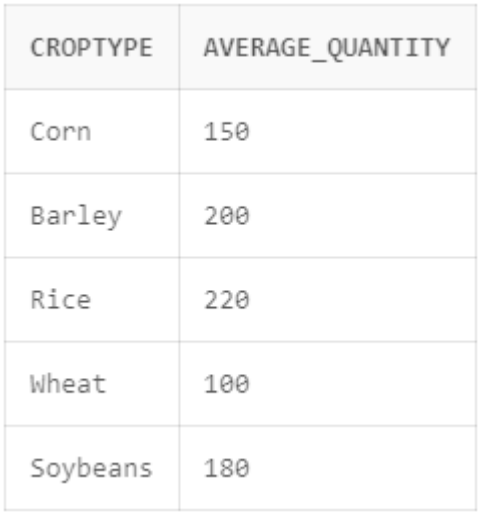
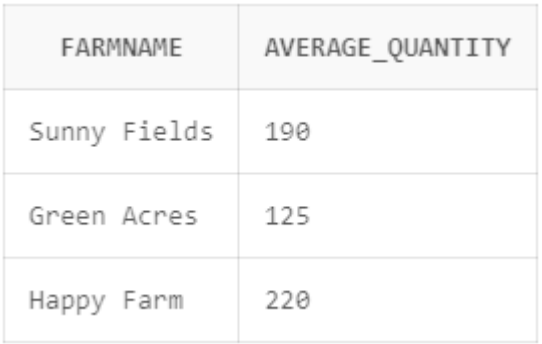
OUTPUT:

```
no data found

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

COMPLIANCEID	FARMID	REGULATION	CINSPECTIONDATE	STATUS
1	1	Pesticide Use	01-MAR-23	Compliant
2	2	Animal Welfare	05-APR-23	Compliant
3	3	Water Usage	10-MAY-23	Non-Compliant
4	4	Organic Certification	15-JUN-23	Compliant
5	5	Worker Safety	20-JUL-23	Compliant

OPERATIONS

<table>
<tr><th>SQL CODE</th><th>OUTPUT</th></tr>
<tr><td colspan="2">Projection on a single column</td></tr>
<tr><td>SELECT FarmName
FROM FARM;</td><td><table><tr><th>FARMNAME</th></tr><tr><td>Green Acres</td></tr><tr><td>Sunny Fields</td></tr><tr><td>Happy Farm</td></tr><tr><td>Farm Fresh</td></tr><tr><td>Golden Harvest</td></tr></table></td></tr>
<tr><td colspan="2">Selection using a logical operator</td></tr>
<tr><td>SELECT * FROM CROP
WHERE CPlantingDate > DATE '2023-04-01';</td><td><table><tr><th>CROPID</th><th>FIELDID</th><th>CROPTYPE</th><th>CPLANTINGDATE</th><th>CHARVESTDATE</th></tr><tr><td>3</td><td>3</td><td>Barley</td><td>01-MAY-23</td><td>25-SEP-23</td></tr><tr><td>4</td><td>4</td><td>Soybeans</td><td>01-JUN-23</td><td>30-OCT-23</td></tr><tr><td>5</td><td>5</td><td>Rice</td><td>01-JUL-23</td><td>15-NOV-23</td></tr></table></td></tr>
<tr><td colspan="2">Pattern Matching</td></tr>
<tr><td>SELECT *
FROM OWNER
WHERE FName LIKE 'J%';</td><td><table><tr><th>OWNERID</th><th>FNAME</th><th>LNAME</th><th>CINFO</th></tr><tr><td>1</td><td>John</td><td>Doe</td><td>john.doe@example.com</td></tr><tr><td>2</td><td>Jane</td><td>Smith</td><td>jane.smith@example.com</td></tr></table></td></tr>
<tr><td colspan="2">Join between two tables</td></tr>
<tr><td>SELECT OWNER.FName, OWNER.LName, FARM.FarmName
FROM OWNER
JOIN FARM ON OWNER.OwnerID = FARM.OwnerID;</td><td><table><tr><th>FNAME</th><th>LNAME</th><th>FARMNAME</th></tr><tr><td>John</td><td>Doe</td><td>Green Acres</td></tr><tr><td>Jane</td><td>Smith</td><td>Sunny Fields</td></tr><tr><td>Alice</td><td>Johnson</td><td>Happy Farm</td></tr><tr><td>Robert</td><td>Brown</td><td>Farm Fresh</td></tr><tr><td>Maria</td><td>Garcia</td><td>Golden Harvest</td></tr></table></td></tr>
</table>

Aggregate function (average)	
SELECT AVG(FSize) AS Average_Farm_Size FROM FARM;	
Counting Records	
SELECT COUNT(*) AS Number_Of_Fields FROM FIELD;	
Group by and aggregate function	
SELECT CROP.CropType, AVG(HARVEST.Quantity) AS Average_Quantity FROM HARVEST JOIN CROP ON HARVEST.CropID = CROP.CropID GROUP BY CROP.CropType;	
Join and aggregate function	
SELECT FARM.FarmName, AVG(HARVEST.Quantity) AS Average_Quantity FROM FARM JOIN FIELD ON FARM.FarmID = FIELD.FarmID JOIN CROP ON FIELD.FieldID = CROP.FieldID JOIN HARVEST ON CROP.CropID = HARVEST.CropID GROUP BY FARM.FarmName;	

<table>
<tr><td colspan="2">Subquery</td></tr>
<tr><td>SELECT FarmName
FROM FARM
WHERE FarmID IN (SELECT FarmID
FROM FIELD WHERE FArea > 50);</td><td>

FARMNAME
Green Acres
Sunny Fields
Happy Farm

</td></tr>
<tr><td colspan="2">Ordering results</td></tr>
<tr><td>SELECT *
FROM LIVESTOCK
ORDER BY LBirthDate DESC;</td><td>

LIVESTOCKID	FARMID	ATYPE	LBIRTHDATE	HEALTHSTATUS
5	3	Chicken	05-MAY-21	Healthy
4	2	Pig	30-APR-21	Healthy
3	2	Goat	25-MAR-21	Healthy
2	1	Sheep	20-FEB-21	Healthy
1	1	Cattle	15-JAN-21	Healthy

</td></tr>
<tr><td colspan="2">Using DISTINCT</td></tr>
<tr><td>SELECT DISTINCT CropType
FROM CROP;</td><td>

CROPTYPE
Corn
Barley
Rice
Wheat
Soybeans

</td></tr>
</table>

Using BETWEEN

```
SELECT * FROM FARM
WHERE FSize BETWEEN 100 AND
200;
```

FARMID	FARMNAME	LOCATION	FSIZE	OWNERID
1	Green Acres	Springfield	150.5	1
2	Sunny Fields	Shelbyville	200	2
3	Happy Farm	Ogdenville	120	3
4	Farm Fresh	North Haverbrook	180	4

Using IN

```
SELECT *
FROM EQUIPMENT
WHERE EType IN ('Vehicle', 'Tool');
```

EQUIPMENTID	FARMID	ENAME	ETYPE	EPURCHASEDATE	MAINTENANCESCHEDULE
1	1	Tractor	Vehicle	01-JAN-22	Quarterly
2	1	Plow	Tool	01-FEB-22	Yearly

Join with condition

```
SELECT FIELD.FieldName,
CROP.CropType
FROM FIELD
JOIN CROP ON FIELD.FieldID =
CROP.FieldID
WHERE CPlantingDate > DATE
'2023-05-01';
```

FIELDNAME	CROPTYPE
Field D	Soybeans
Field E	Rice

Join and Condition

```
SELECT OWNER.FName,
OWNER.LName, FARM.FarmName,
FARM.FSize
FROM OWNER
JOIN FARM ON OWNER.OwnerID =
FARM.OwnerID
WHERE FARM.FSize > 150;
```

FNAME	LNAME	FARMNAME	FSIZE
John	Doe	Green Acres	150.5
Jane	Smith	Sunny Fields	200
Robert	Brown	Farm Fresh	180
Maria	Garcia	Golden Harvest	250

UPDATE

SELECT * FROM FARM WHERE FarmID = 1;

UPDATE FARM SET FSize = 160.0 WHERE FarmID = 1;

SELECT * FROM FARM WHERE FarmID = 1;

OUTPUT:

FARMID	FARMNAME	LOCATION	FSIZE	OWNERID
1	Green Acres	Springfield	150.5	1

Download CSV

1 row(s) updated.

FARMID	FARMNAME	LOCATION	FSIZE	OWNERID
1	Green Acres	Springfield	160	1

DELETE

SELECT * FROM LIVESTOCK;

DELETE FROM LIVESTOCK WHERE LivestockID = 5;

SELECT * FROM LIVESTOCK;

OUTPUT

LIVESTOCKID	FARMID	ATYPE	LBIRTHDATE	HEALTHSTATUS
1	1	Cattle	15-JAN-21	Healthy
2	1	Sheep	20-FEB-21	Healthy
3	2	Goat	25-MAR-21	Healthy
4	2	Pig	30-APR-21	Healthy

Download CSV

4 rows selected.

0 row(s) deleted.

LIVESTOCKID	FARMID	ATYPE	LBIRTHDATE	HEALTHSTATUS
1	1	Cattle	15-JAN-21	Healthy
2	1	Sheep	20-FEB-21	Healthy
3	2	Goat	25-MAR-21	Healthy
4	2	Pig	30-APR-21	Healthy