**Sql query and Scripts**

-- create database Project

-- use project

-- CREATE TABLE Farmers (

-- farmer\_id INT PRIMARY KEY,

-- name VARCHAR(100),

-- phone VARCHAR(20),

-- address VARCHAR(200),

-- education VARCHAR(50)

-- );

-- CREATE TABLE Farms (

-- farm\_id INT PRIMARY KEY,

-- farmer\_id INT,

-- location VARCHAR(100),

-- total\_area DECIMAL(10, 2),

-- FOREIGN KEY (farmer\_id) REFERENCES Farmers(farmer\_id)

-- );

-- CREATE TABLE Crops (

-- crop\_id INT PRIMARY KEY,

-- farm\_id INT,

-- crop\_type VARCHAR(50),

-- planting\_date DATE,

-- expected\_harvest\_date DATE,

-- FOREIGN KEY (farm\_id) REFERENCES Farms(farm\_id)

-- );

-- CREATE TABLE Weather\_Data (

-- weather\_id INT PRIMARY KEY,

-- farm\_id INT,

-- date DATE,

-- temperature DECIMAL(5, 2),

-- rainfall DECIMAL(5, 2),

-- humidity DECIMAL(5, 2),

-- FOREIGN KEY (farm\_id) REFERENCES Farms(farm\_id)

-- );

-- CREATE TABLE Soil\_Data (

-- soil\_id INT PRIMARY KEY,

-- farm\_id INT,

-- date DATE,

-- ph\_level DECIMAL(4, 2),

-- nitrogen\_level DECIMAL(5, 2),

-- phosphorus\_level DECIMAL(5, 2),

-- potassium\_level DECIMAL(5, 2),

-- FOREIGN KEY (farm\_id) REFERENCES Farms(farm\_id)

-- );

-- CREATE TABLE Yield\_Predictions (

-- prediction\_id INT PRIMARY KEY,

-- crop\_id INT,

-- prediction\_date DATE,

-- predicted\_yield DECIMAL(10, 2),

-- actual\_yield DECIMAL(10, 2),

-- FOREIGN KEY (crop\_id) REFERENCES Crops(crop\_id)

-- );

-- Insert Farmers

INSERT INTO Farmers (farmer\_id, name, phone, address, education)

VALUES

(1, 'Wanjiru Kamau', '+254712345678', 'Nyeri County, Central Kenya', 'Primary'),

(2, 'Ochieng Otieno', '+254723456789', 'Siaya County, Western Kenya', 'Secondary'),

(3, 'Amina Hassan', '+254734567890', 'Kilifi County, Coastal Kenya', 'No formal education'),

(4, 'Daniel Kipchoge', '+254745678901', 'Uasin Gishu County, Rift Valley', 'Diploma in Agriculture'),

(5, 'Fatuma Yusuf', '+254756789012', 'Garissa County, North Eastern Kenya', 'Primary');

-- Insert Farms

INSERT INTO Farms (farm\_id, farmer\_id, location, total\_area)

VALUES

(1, 1, 'Tetu, Nyeri County', 2.5),

(2, 2, 'Gem, Siaya County', 1.8),

(3, 3, 'Kilifi North, Kilifi County', 3.0),

(4, 4, 'Moiben, Uasin Gishu County', 5.5),

(5, 5, 'Balambala, Garissa County', 2.0);

-- Insert Crops

INSERT INTO Crops (crop\_id, farm\_id, crop\_type, planting\_date, expected\_harvest\_date)

VALUES

(1, 1, 'Maize', '2023-03-15', '2023-08-15'),

(2, 1, 'Beans', '2023-03-20', '2023-06-20'),

(3, 2, 'Sorghum', '2023-04-01', '2023-07-30'),

(4, 3, 'Cassava', '2023-02-01', '2024-01-31'),

(5, 4, 'Wheat', '2023-05-01', '2023-09-30'),

(6, 5, 'Millet', '2023-04-15', '2023-08-15');

-- Insert Weather\_Data (sample data for one week)

INSERT INTO Weather\_Data (weather\_id, farm\_id, date, temperature, rainfall, humidity)

VALUES

(1, 1, '2023-03-15', 22.5, 0.0, 65),

(2, 1, '2023-03-16', 23.0, 5.2, 70),

(3, 1, '2023-03-17', 22.0, 10.5, 75),

(4, 1, '2023-03-18', 21.5, 2.0, 68),

(5, 1, '2023-03-19', 23.5, 0.0, 62);

-- Insert Soil\_Data

INSERT INTO Soil\_Data (soil\_id, farm\_id, date, ph\_level, nitrogen\_level, phosphorus\_level, potassium\_level)

VALUES

(1, 1, '2023-03-10', 6.5, 40, 35, 80),

(2, 2, '2023-03-12', 5.8, 30, 25, 60),

(3, 3, '2023-02-28', 7.2, 50, 40, 90),

(4, 4, '2023-04-25', 6.8, 45, 38, 85),

(5, 5, '2023-04-10', 6.0, 35, 30, 70);

-- Insert Yield\_Predictions

INSERT INTO Yield\_Predictions (prediction\_id, crop\_id, prediction\_date, predicted\_yield, actual\_yield)

VALUES

(1, 1, '2023-05-15', 3.5, NULL),

(2, 2, '2023-05-15', 1.2, NULL),

(3, 3, '2023-05-20', 2.8, NULL),

(4, 4, '2023-05-25', 15.0, NULL),

(5, 5, '2023-06-01', 4.2, NULL);

**SQL SCRIPTS**

-- Retrieve all crops planted by Wanjiru Kamau (farmer\_id = 1)

-- SELECT f.name AS farmer\_name, c.crop\_type, c.planting\_date, c.expected\_harvest\_date

-- FROM Crops c

-- JOIN Farms fm ON c.farm\_id = fm.farm\_id

-- JOIN Farmers f ON fm.farmer\_id = f.farmer\_id

-- WHERE f.farmer\_id = 1;

-- Calculate average predicted yield for each crop type

-- SELECT c.crop\_type, AVG(yp.predicted\_yield) as avg\_predicted\_yield

-- FROM Yield\_Predictions yp

-- JOIN Crops c ON yp.crop\_id = c.crop\_id

-- GROUP BY c.crop\_type;

-- Analyze the rainfall data for Wanjiru Kamau's farm

-- SELECT c.crop\_type, AVG(w.rainfall) as avg\_rainfall, MAX(w.rainfall) as max\_rainfall, MIN(w.rainfall) as min\_rainfall

-- FROM Weather\_Data w

-- JOIN Farms f ON w.farm\_id = f.farm\_id

-- JOIN Crops c ON f.farm\_id = c.farm\_id

-- WHERE f.farm\_id = 1

-- GROUP BY c.crop\_type;

-- Analyze the relationship between farm size and predicted yield

-- SELECT f.name AS farmer\_name, fm.total\_area AS farm\_size, c.crop\_type, yp.predicted\_yield

-- FROM Yield\_Predictions yp

-- JOIN Crops c ON yp.crop\_id = c.crop\_id

-- JOIN Farms fm ON c.farm\_id = fm.farm\_id

-- JOIN Farmers f ON fm.farmer\_id = f.farmer\_id

-- ORDER BY fm.total\_area DESC, yp.predicted\_yield DESC;