

(a) Background Information:

Akorma Farms is an agricultural enterprise that owns and operates multiple farms. Akorma Farms, situated in Accra, Ghana, specializes in various animals and crops. Akorma farms aim to maximize efficiency, cut expenses, and improve revenues by utilising economies of scale and pooling resources among the several farms.

(b) Database Functionalities:

Store information about staff members, including their personal details and job roles

Track information about farmers and their associated farms, including type of farm, start date, and bonus/commission details

Manage information about specific types of farms, such as poultry, cattle, and crop farms, including farm size, number of animals/crops, and vaccination/medication records

Monitor sales and accounting information, including allowances, commissions, and sales data for the farm shop

Maintain information about farm equipment, including model, year of purchase, and cost

Record information about specific products sold in the farm shop, including name, date, price, description, and quantity

Specialization/Generalization:

Akoma farms has three types of farms: poultry, cattle, and crop farms. These farms share some common attributes, such as farm size and number of employees, but also have unique attributes specific to their type. For example, poultry farms track the number of birds and types of birds,

while crop farms record information about soil type and fertilizer quantity. This can be represented as a specialization/generalization structure in the database design.

## STRONG ENTITIES

Farmer

PoultryFarm

CattleFarm

CropFarm

## Key and Non Key Attributes

list of tables, key and non-key attributes, and primary and foreign keys for each table in the database:

Staff Member table

Key attribute: staffID

Non-key attributes: firstName, lastName, address, phone, gender, email, birthdate

Primary key: staffID

Farmer table

Key attribute: farmerID

Non-key attributes: TypeOfFarmerStartDate, bonus

Primary key: farmerID

Foreign key: staffID (from Staff Member table)

Poultry Farmer table

Key attribute: poultryFarmerID

Non-key attributes: allowance, commissions, numOfBirds

Primary key: poultryFarmerID

Foreign key: farmerID (from Farmer table)

Poultry Farm table

Key attribute: poultryFarmID

Non-key attributes: farmSize, noOfBirds, typesOfBirds, feedType, numOfEmployees,  
Vaccination, equipment, medRecord

Primary key: poultryFarmID

Foreign key: poultryFarmerID (from Poultry Farmer table)

Cattle Farmer table

Key attribute: cattleFarmerID

Non-key attributes: allowance, commissions, numOfCattle

Primary key: cattleFarmerID

Foreign key: farmerID (from Farmer table)

Cattle Farm table

Key attribute: cattleFarmID

Non-key attributes: numOfCattle, breed, age, gender, productionRec, feedType, vaccination, medRecord, numOfEmployees

Primary key: cattleFarmID

Foreign key: cattleFarmerID (from Cattle Farmer table)

Crop Farmer table

Key attribute: cropFarmerID

Non-key attributes: allowance, commissions, numOFCrops

Primary key: cropFarmerID

Foreign key: farmerID (from Farmer table)

Crop Farm table

Key attribute: cropFarmID

Non-key attributes: cropType, acreage, soilType, fertilizerType, quantity\_Fertilizer, plantDate, harvestDate, Pesticide, irrigationMethod, yield

Primary key: cropFarmID

Foreign key: cropFarmerID (from Crop Farmer table)

Manager table

Key attribute: managerID

Non-key attributes: managerStartDate, bonus

Primary key: managerID

Foreign key: staffID (from Staff Member table)

Sales & Accounting table

Key attribute: salesAndAccountingID

Non-key attributes: allowance, commission

Primary key: salesAndAccountingID

Foreign key: staffID (from Staff Member table)

Farm Shop table

Key attribute: farmShopID

Non-key attributes: name, date, price, description, quantity

Primary key: farmShopID

Farm Equipment table

Key attribute: equipmentID

Non-key attributes: model, yearOfPurchase, cost, warranty

Primary key: equipmentID

Note: The foreign keys are represented as the primary keys of the referenced tables.

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Staff Member table

Key attribute: staffID

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Primary key: staffID

Farmer table

Key attribute: farmerID

Non-key attributes: TypeOfFarmerStartDate, bonus

Primary key: farmerID

Foreign key: staffID (from Staff Member table)

Poultry Farmer table

Key attribute: poultryFarmerID

Non-key attributes: allowance, commissions, numOfBirds

Primary key: poultryFarmerID

Foreign key: farmerID (from Farmer table)

Poultry Farm table

Key attribute: poultryFarmID

Non-key attributes: farmSize, noOfBirds, typesOfBirds, feedType, numOfEmployees,  
Vaccination, equipment, medRecord

Primary key: poultryFarmID

Foreign key: poultryFarmerID (from Poultry Farmer table)

Cattle Farmer table

Key attribute: cattleFarmerID

Non-key attributes: allowance, commissions, numOfCattle

Primary key: cattleFarmerID

Foreign key: farmerID (from Farmer table)

Cattle Farm table

Key attribute: cattleFarmID

Non-key attributes: numOfCattle, breed, age, gender, productionRec, feedType, vaccination, medRecord, numOfEmployees

Primary key: cattleFarmID

Foreign key: cattleFarmerID (from Cattle Farmer table)

Crop Farmer table

Key attribute: cropFarmerID

Non-key attributes: allowance, commissions, numOFCrops

Primary key: cropFarmerID

Foreign key: farmerID (from Farmer table)

Crop Farm table

Key attribute: cropFarmID

Non-key attributes: cropType, acreage, soilType, fertilizerType, quantity\_Fertilizer, plantDate, harvestDate, Pesticide, irrigationMethod, yield

Primary key: cropFarmID

Foreign key: cropFarmerID (from Crop Farmer table)

Manager table

Key attribute: managerID

Non-key attributes: managerStartDate, bonus

Primary key: managerID

Foreign key: staffID (from Staff Member table)

Sales & Accounting table

Key attribute: salesAndAccountingID

Non-key attributes: allowance, commission

Primary key: salesAndAccountingID

Foreign key: staffID (from Staff Member table)

Farm Shop table

Key attribute: farmShopID

Non-key attributes: name, date, price, description, quantity

Primary key: farmShopID

Farm Equipment table

Key attribute: equipmentID

Non-key attributes: model, yearOfPurchase, cost, warranty

Primary key: equipmentID

Note: The foreign keys are represented as the primary keys of the referenced tables.



Entities:

Customer (customer\_id PK, first\_name, last\_name, email, phone, address)

Staff (staff\_id PK, first\_name, last\_name, date\_of\_birth, phone, email, hire\_date, job\_title, salary)

Farmer (farmer\_id PK, staff\_id FK, farm\_type, years\_of\_experience)

Poultry\_Farmer (poultry\_farmer\_id PK, farmer\_id FK)

Cattle\_Farmer (cattle\_farmer\_id PK, farmer\_id FK)

Crop\_Farmer (crop\_farmer\_id PK, farmer\_id FK)

Farm (farm\_id PK, farmer\_id FK, farm\_type, farm\_name, farm\_location)

Poultry\_Farm (poultry\_farm\_id PK, farm\_id FK, poultry\_farmer\_id FK)

Cattle\_Farm (cattle\_farm\_id PK, farm\_id FK, cattle\_farmer\_id FK)

Crop\_Farm (crop\_farm\_id PK, farm\_id FK, crop\_farmer\_id FK)

Manager (manager\_id PK, staff\_id FK, department)

Staff\_Manager (staff\_id PK/FK, manager\_id PK/FK)

Sales\_Accounting (department PK, staff\_id FK)

Farm\_Shop (shop\_id PK, farm\_id FK, shop\_name, shop\_location)

Product (product\_id PK, shop\_id FK, product\_name, price, quantity)

Farm\_Equipment (equipment\_id PK, farm\_id FK, equipment\_name, purchase\_date,  
purchase\_price)Relationships:

ER Diagram

