CREATE DATABASE `farm`;

CREATE TABLE `farm`.`crop` (

`Cname` VARCHAR(15) NOT NULL,

`YieldExp` INT(11) DEFAULT NULL,

`MaxStorageTime` INT(11) DEFAULT NULL,

`GrowTime` INT(11) DEFAULT NULL,

`SeedBrand` VARCHAR(15) DEFAULT NULL,

PRIMARY KEY (`Cname`)

);

INSERT INTO `farm`.`crop` VALUES ('wheat',500,36,8,'Dupout'),('corn',750,24,4,'Mornsanto'),('soybean',170,48,5,'Mornsanto'),('potato',2000,7,2,'syngenta'),('lettuce',1600,1,2,'Seminis'),('tomato',6000,1,4,'Syngenta');

CREATE TABLE `farm`.`purchaser` (

`Company` VARCHAR(15) NOT NULL,

`Address` VARCHAR(50) NULL,

`PhoneNo` CHAR(10) NOT NULL,

`Contact` VARCHAR(15) NOT NULL,

`StartOfContact` VARCHAR(10) NOT NULL,

`EndOfContract` VARCHAR(10) NOT NULL,

PRIMARY KEY (`Company`)

);

INSERT INTO `farm`.`purchaser` VALUES ('Walmart','1088 Broadway St IN','2192465874','Mr.Smith','2017/7/6','2030/1/1'),('Goodhealth','1036 Indianapolis IN','2192424565','Mr.Handsome','2017/9/6','2035/6/7'),('Godfish','1153 Berries Summer IN','2193456857','Mr.Mole','2017/3/7','2037/5/9'),('Mcdonald','761 Vose Hometory IN','2193247865','Mr.Nelson','2014/3/9','2034/2/5'),('Subway','986 stone Summer IN','2198562764','Mr.Adam','2018/3/1','2038/9/9'),('KFC','623 Todame Bollaria IN','2199637152','Mr.roberts','2008/6/6','2028/1/1');

CREATE TABLE `farm`.`purchase` (

`Purchaser` VARCHAR(15) NOT NULL,

`Crop` VARCHAR(15) NOT NULL,

`Quantity` INT(11) NULL,

`UnitPrice` DECIMAL(3,1) NULL,

PRIMARY KEY (`Purchaser`, `Crop`),

FOREIGN KEY (`Purchaser`)

REFERENCES `farm`.`purchaser` (`Company`),

FOREIGN KEY (`Crop`)

REFERENCES `farm`.`crop` (`Cname`)

);

INSERT INTO `farm`.`purchase` VALUES ('Walmart','wheat',400,0.4),('Goodhealth','wheat',700,0.3),('godfish','corn',750,0.6),('Mcdonald','potato',1800,0.5),('Subway','Lettuce',1500,0.5),('KFC','tomato',5500,0.2),('Walmart','tomato',4500,0.2),('Goodhealth','corn',600,0.3),('Godfish','soybean',600,0.6),('Mcdonald','Lettuce',1000,0.5),('Subway','tomato',4000,0.2),('KFC','potato',1500,0.5),('Walmart','potato',700,0.4),('Walmart','Lettuce',1500,0.5);

CREATE TABLE `farm`.`farmer` (

`﻿Fname` VARCHAR(15) NOT NULL,

`Minit` char(1) DEFAULT NULL,

`Lname` VARCHAR(15) NOT NULL,

`FID` char(5) NOT NULL,

`Gender` char(1) NOT NULL,

`Bdate` VARCHAR(10) DEFAULT NULL,

`PhoneNo` char(10) NOT NULL,

`LeaderID` char(5) DEFAULT NULL,

PRIMARY KEY (`FID`),

FOREIGN KEY (`LeaderID`)

REFERENCES `farm`.`farmer` (`FID`)

);

INSERT INTO `farm`.`farmer` VALUES ('Emma','L','Davis','F0001','F','1972/3/6','2193456825',null),('Jacob','M','Bush','F0002','M','1979/3/9','2193546985','F0001'),('James','Y','Smith','F0003','M','1986/1/16','2193549646','F0002'),('Aidan','I','Johnson','F0004','M','1978/6/7','2191354899','F0001'),('Chase','I','Taylor','F0005','M','1990/7/4','2196665849','F0002'),('Liam','O','Williams','F0006','M','1987/8/12','2193333333','F0004'),('Alex','P','Martin','F0007','M','1989/2/18','2199999999','F0002'),('Zoe','P','Thompson','F0008','F','1992/9/18','2195465854','F0004'),('Rachel','T','Brown','F0009','F','1989/9/7','2197777777','F0002');

CREATE TABLE `farm`.`farmland` (

`LID` CHAR(4) NOT NULL,

`Area` INT(11) NOT NULL,

`Soil` VARCHAR(20) NULL,

`FarmerID` CHAR(5) NOT NULL,

PRIMARY KEY (`LID`),

FOREIGN KEY (`FarmerID`)

REFERENCES `farm`.`farmer` (`FID`)

);

INSERT INTO `farm`.`farmland` VALUES ('L001',60,'Cinnamon soil','F0001'),('L002',150,'Red soil','F0002'),('L003',58,'Red soil','F0003'),('L004',57,'Cinnamon soil','F0004'),('L005',60,'Red soil','F0005'),('L006',180,'Red soil','F0006'),('L007',166,'Black soil','F0007'),('L008',58,'Cinnamon soil','F0008'),('L009',60,'Black soil','F0009'),('L010',10,'Red soil','F0005'),('L011',15,'Cinnamon soil','F0009'),('L012',19,'Cinnamon soil','F0008'),('L013',59,'Red soil','F0006'),('L014',57,'Cinnamon soil','F0007'),('L015',62,'Black soil','F0003');

CREATE TABLE `farm`.`plan` (

`LandID` CHAR(4) NOT NULL,

`CropName` VARCHAR(20) NOT NULL,

`Fertilizer` VARCHAR(20) NULL,

`TimeOfYear` VARCHAR(20) NOT NULL,

PRIMARY KEY (`LandID`, `CropName`),

FOREIGN KEY (`LandID`)

REFERENCES `farm`.`farmland` (`LID`),

FOREIGN KEY (`CropName`)

REFERENCES `farm`.`crop` (`Cname`)

);

INSERT INTO `farm`.`plan` VALUES ('L001','wheat','NPK','first half year'),('L002','corn','Single nutrient','second half year'),('L003','soybean','NP','full year'),('L004','potato','NK','full year'),('L005','lettuce','PK','full year'),('L006','tomato','Micronutrients','full year'),('L007','wheat','NPK','first half year'),('L008','corn','Single nutrient','second half year'),('L009','soybean','NP','full year'),('L010','potato','NK','full year'),('L011','lettuce','PK','full year'),('L012','tomato','Micronutrients','full year'),('L013','wheat','NPK','first half year'),('L014','corn','Single nutrient','second half year'),('L015','soybean','NP','full year'),('L001','corn','Single nutrient','second half year'),('L002','wheat','NPK','first half year'),('L007','corn','Single nutrient','second half year'),('L008','wheat','NPK','first half year'),('L013','corn','Single nutrient','second half year'),('L014','wheat','NPK','first half year');

CREATE TABLE `farm`.`barnadmin` (

`﻿FirstName` VARCHAR(15) NOT NULL,

`Mid` char(1) DEFAULT NULL,

`LastName` VARCHAR(15) NOT NULL,

`AdminID` char(5) NOT NULL,

`Gender` char(1) NOT NULL,

`PNumber` BIGINT NOT NULL,

PRIMARY KEY (`AdminID`)

);

INSERT INTO `farm`.`barnadmin` VALUES ('Kakala','L','Lopez','A0001','F',2199954865),('Audrey','K','Wright','A0002','F',2199964321),('Logan','K','King','A0003','M',2197456321),('Elligh','J','Scott','A0004','M',2191234567),('Diego','H','Allen','A0005','M',2197568423),('Kyle','M','Hill','A0006','M',2191756985);

CREATE TABLE `farm`.`barn` (

`BID` char(4) NOT NULL,

`Capacity` INT(11) NOT NULL,

`Administrator` char(5) NOT NULL,

PRIMARY KEY (`BID`),

FOREIGN KEY (`Administrator`)

REFERENCES `farm`.`barnadmin` (`AdminID`)

);

INSERT INTO `farm`.`barn` VALUES ('B001',1200,'A0001'),('B002',1500,'A0002'),('B003',1300,'A0003'),('B004',1300,'A0004'),('B005',800,'A0005'),('B006',900,'A0006');

CREATE TABLE `farm`.`section` (

`﻿BarnID` CHAR(4) NOT NULL,

`SectionNo` CHAR(4) NOT NULL,

`CropName` VARCHAR(15) DEFAULT NULL,

`Temp` INT(11) DEFAULT NULL,

`Humidity` decimal(3,2) DEFAULT NULL,

`Stock` INT(11) DEFAULT NULL,

PRIMARY KEY (`﻿BarnID`,`SectionNo`),

FOREIGN KEY (`﻿BarnID`)

REFERENCES `farm`.`barn` (`BID`)

);

INSERT INTO `farm`.`section` VALUES ('B001','S001','wheat',13,0.50,150),('B001','S002','corn',10,0.60,200),('B001','S003','soybean',15,0.60,110),('B002','S001','potato',5,0.60,100),('B002','S002','Lettuce',0,0.50,100),('B003','S001','Lettuce',0,0.50,50),('B003','S002','wheat',13,0.50,150),('B004','S001','potato',5,0.60,130),('B004','S002','lettuce',0,0.50,90),('B004','S003',null,0,0.50,0),('B005','S001','soybean',15,0.60,0),('B005','S002',null,10,0.60,0),('B006','S001','corn',10,0.60,240),('B006','S002','soybean',15,0.60,110);

Query 0

**Retrieve the birth date and the phone number of the farmer(s) whose name is ‘Kakala L. Lopez’.**

**SELECT farmer.Bdate, farmer.PhoneNo**

**FROM farmer**

**WHERE farmer.Fname = 'Liam' AND farmer.Minit = 'O' AND farmer.Lname = 'Williams';**

Query 1

**Retrieve the name and phone number of the farmer who takes charge of the land of which the ID is L008.**

**SELECT farmer.Fname, farmer.Minit, farmer.Lname, farmer.PhoneNo**

**FROM farmer, farmland**

**WHERE farmer.FID = farmland.FarmerID AND farmland.LID = 'L008';**

Query 2

**For every planting plan of farmlands which are in the charge of the farmer whose ID is F0006, list the land ID, crop name, time of the year, fertilizer, and the seed brand it is using.**

**SELECT plan.LandID, plan.CropName, plan.TimeOfYear, plan.Fertilizer, crop.SeedBrand**

**FROM crop, plan, farmland**

**WHERE farmland.FarmerID = 'F0006' AND plan.LandID = farmland.LID AND crop.Cname = plan.CropName;**

Query3.

**Retrieve the company who buy all kind of corns stored in barn B001.**

**SELECT Purchaser.Company**

**FROM Purchaser**

**WHERE NOT EXISTS (SELECT \***

**FROM Purchase B**

**WHERE (B.Crop IN (SELECT Section.CropName**

**FROM Section**

**WHERE Section.BarnID=’B003’)**

**AND**

**NOT EXISTS (SELECT \***

**FROM Purchase C**

**WHERE C.Crop = B.Crop**

**AND C.Purchaser=Purchaser.Company)));**

Query 4

**Make a list of the land ID, crop name, time of the year, and the fertilizer of each planting plan either in the charge of a farmer whose last name is ‘Bush’, or plant tomato any time of the year.**

**(SELECT plan.LandID, plan.CropName, plan.TimeOfYear, plan.Fertilizer**

**FROM plan, farmer, farmland**

**WHERE farmer.Lname = 'bush' AND farmland.FarmerID = farmer.FID AND plan.LandID = farmland.LID)**

**UNION**

**(SELECT plan.LandID, plan.CropName, plan.TimeOfYear, plan.Fertilizer**

**FROM plan**

**WHERE plan.CropName = 'tomato');**

Query 4A

**Make a list of the land ID, crop name, time of the year, and the fertilizer of each planting plan either in the charge of a farmer whose last name is ‘Bush’, or plant tomato any time of the year.**

**SELECT plan.LandID, plan.CropName, plan.TimeOfYear, plan.Fertilizer**

**FROM plan**

**WHERE plan.LandID IN (SELECT farmland.LID**

**FROM farmer, farmland**

**WHERE farmer.Lname = 'Bush' AND farmland.FarmerID = farmer.FID)**

**OR plan.LandID IN (SELECT plan.LandID**

**FROM plan**

**WHERE plan.CropName = 'tomato');**

Query 5

**Retrieve the names of all farmers who take care of two or more farmlands.**

**SELECT farmer.Lname, farmer.Fname**

**FROM farmer**

**WHERE (SELECT COUNT(\*)**

**FROM farmland**

**WHERE farmer.FID=farmland.FarmerID)>=2;**

Query 6

**Retrieve the IDs of barns of which the sections are all occupied.**

**SELECT distinct section.﻿BarnID**

**FROM section**

**WHERE section.﻿BarnID not in(SELECT distinct section.﻿BarnID**

**FROM section**

**WHERE section.﻿stock = 0);**

Query 7

**List the ID of the barns which has at least one empty section and having a capacity greater than 1000.**

**SELECT barn.BID**

**FROM barn**

**WHERE EXISTS (SELECT \* FROM section WHERE section.stock = 0 AND barn.BID = section.BarnID)**

**AND barn.Capacity > 1000;**

Queries 8

**For each farmer, retrieve his or her first and last name and the first and last name of his or her immediate Leader.**

**SELECT F.Fname, F.Lname, L.Fname, L.Lname**

**FROM farmer as F, farmer as L**

**WHERE F.LeaderID = L.FID;**

Query 8A

**For each farmer, retrieve his or her first name and the first name of his or her immediate Leader.**

**SELECT F.Fname as Farmer\_firstName, L.Fname as Leader\_firstname**

**FROM farmer as F, farmer as L**

**WHERE F.LeaderID = L.FID;**

Queries 9

**Select the ID of all the farmers.**

**SELECT farmer.FID**

**FROM farmer;**

Queries 10

**Select all combinations of barn administrator’s last name and the id of the barn that he or she takes charge of.**

**SELECT barnadmin.LastName, barn.BID**

**FROM barnadmin, barn;**

Query 11

**Retrieve the capacity of all barns**

**SELECT ALL barn.Capacity**

**FROM barn;**

Query 11A

**Retrieve the capacity of all barns**

**SELECT DISTINCT barn.Capacity**

**FROM barn;**

Query 12

**Retrieve the company name and the contact phone number of our purchasers whose address is in “Vose Hometory”.**

**select purchaser.Company, purchaser.PhoneNo**

**from purchaser**

**where purchaser.Address LIKE '%Vose Hometory%';**

Query 12A

**Find the name of all the farmers whose birthdate is in March.**

**SELECT farmer.Fname, farmer.Lname**

**FROM farmer**

**WHERE farmer.Bdate LIKE '\_\_\_\_\_3\_\_';**

Query 13

**Show the result of the capacity if every barn involved in soybean storage is expanded by 10 percent.**

**SELECT barn.BID, 1.1 \* barn.Capacity**

**FROM barn, section**

**WHERE section.BarnID = barn.BID AND CropName = 'soybean';**

Query 14

**Retrieve all farmland which has ‘Cinnamon soil’ and the area of land is between 0 and 50.**

**SELECT \***

**FROM farmland**

**WHERE (farmland.Area BETWEEN 0 AND 50) AND farmland.Soil='Cinnamon soil';**

Query 15

**For each piece of land, retrieve the landID, crop name, the soil type of the land, and the grow time of the crops, ordered by land ID, and, for each piece of land, ordered alphabetically by crop name, then grow time.**

**SELECT plan.landID, crop.Cname, plan.TimeOfYear, farmland.Soil**

**FROM crop, plan, farmland**

**WHERE crop.Cname = plan.CropName AND farmland.LID = plan.LandID**

**ORDER BY plan.landID, crop.Cname, plan.TimeOfYear;**

Query16

**Retrieve the contacts of purchasers who buy wheat.**

**SELECT P.Contact**

**FROM Purchaser AS P**

**WHERE P.Company in (SELECT Purchaser**

**FROM Purchase as B**

**WHERE B.Crop ='wheat');**

Query 17

**Retrieve the LandID of all farmland where wheat, corn or soybean is planted any time of a year.**

**SELECT DISTINCT plan.LandID**

**FROM plan**

**WHERE plan.CropName IN ('wheat', 'corn', 'soybean');**

Query 18

**Retrieve the names of all famers who do not have supervisors.**

**SELECT farmer.Fname, farmer.Lname**

**FROM farmer**

**WHERE farmer.LeaderID IS NULL;**

Query 19

**Find the sum of the purchase quantity of all purchasers, the maximum quantity, the minimum quantity, and the average quantity. (i.e. maximum, minimum and average quantity refer to quantity of one kind of corn bought by one purchaser)**

**SELECT SUM(purchase.Quantity), MAX(purchase.Quantity), MIN(purchase.Quantity), AVG(purchase.Quantity)**

**FROM purchase;**

Query 20

**Find the sum of the purchase quantity of Walmart, as well as the maximum quantity, the minimum quantity, and the average quantity. (i.e. maximum, minimum and average quantity refer to quantity of one kind of corn bought by Walmart)**

**SELECT SUM(purchase.Quantity), MAX(purchase.Quantity), MIN(purchase.Quantity), AVG(purchase.Quantity)**

**FROM purchase**

**WHERE purchase.Purchaser = 'Walmart';**

Query 21

**Retrieve the total number of farmlands of the farm.**

**SELECT COUNT(\*)**

**FROM farmland;**

Query 22

**Retrieve the number of farmlands taken care of by the farmer whose firstname is ‘Emma’.**

**SELECT COUNT(\*)**

**FROM farmland, farmer**

**WHERE farmer.FID = farmland.FarmerID AND farmer.Fname = 'James';**

Query 23

**Count the number of distinct temperature values of sections**

**SELECT COUNT(DISTINCT section.Temp)**

**FROM section;**

Query 24.

**For each purchased crop, list the number of company purchasing it, along with the average quantity.**

**SELECT purchase.Crop, count(\*),avg(purchase.Quantity)**

**FROM purchase**

**GROUP BY purchase.Crop;**

Query 25

**For each farmer being in charge of a piece of land, list his or her ID, the fertilizers used in the land, and how many times each fertilizer is used.**

**select farmland.FarmerID, plan.Fertilizer, count(\*)**

**from farmland,plan**

**where farmland.﻿LID = plan.﻿LandID**

**group by farmland.FarmerID, plan.Fertilizer;**

Query 26

**For each plan on which more than two types of fertilizer are used, retrieve the crop name, farmer ID and the number of fertilizer.**

**select farmland.FarmerID, plan.Fertilizer, count(\*)**

**from farmland, plan**

**where farmland.﻿LID = plan.﻿LandID**

**group by farmland.FarmerID**

**having count(\*) > 2;**

Query 27

**For each purchaser, retrieve the company name, the phone number, and the number of plans its purchase involves. (i.e. how many plans can potentially yield the product it desires)**

**SELECT purchaser.Company, purchaser.PhoneNo, count(\*)**

**FROM purchaser, purchase, plan**

**WHERE purchase.Crop = plan.CropName AND purchaser.Company = purchase.purchaser**

**GROUP BY purchaser.Company;**

Query 28

**Retrieve the farmland soil, the farmland area which greater than 20 and the number of soil which greater than 3.**

**select farmland.Soil,count(\*)**

**from farmland**

**where farmland.Area > 20**

**AND farmland.Soil in(select farmland.Soil**

**from farmland**

**group by farmland.Soil**

**having count(\*)>3)**

**group by farmland.Soil;**