

**Faculty of Computing and Technology, University of Kelaniya**

Department of Software Engineering

**Introduction to Database Management Systems**

**[CSCI 11062]**

**Assignment – Realizing database design process**

**(Pharmacy Management Database)**

**CS/2020/026-W.G.Supuni Punsarani**

**Date Of Submission:2022/11/20**

**Declaration**

I hereby certify that this report does not contain any material previously published or written by another person except where due reference is made in the text.



……………………………



(Signature of the student)

Date: 20/11/2022

**Pharmacy Management Database**

**Requirements of the database:**

I selected a pharmacy management database as a business process database. It was based on managing pharmacy requirements. The system can encode both customer and medicines information. Pharmacy admin can identify the inventories of sales and stocks.

In this system, customers, suppliers, and employees in pharmacy are major characters. **Employee id** is used to uniquely identify an employee. Every employee has **name (considered as three pars first name, initials, and surname), mobile number, salary, role of the job, date of work and address.** An employee can addmany customersfor their business, but customers can add one employee of the pharmacy. Any customers who are added must have exactly one employee of the pharmacy. Whenever a customer is added by a employee, the pharmacy wishes to record their details. They give **customer id** for their customers, Also, they record **customer’s name, mobile number, address (considered as three parts house number, street, and city)**

Suppliers are special character of this scenario. A supplier can add many employees for their business, but employee can add one supplier, **Supplier id** is used to uniquely identify a supplier. New suppliers are required to produce their **company name, mobile** **number, address by the pharmacy**. An employee is added must have exactly one supplier of the pharmacy.

Another service is done by employees is write purchase invoice for suppliers. They include **purchase** **invoice id, date, total** **amount, payment type, discounts, paid amount, and remaining amount** in their purchase invoice. An employee can write many purchase invoices and a purchase invoice is written by one employee. A purchase invoice which is written must have exactly one employee. Many purchase invoices are written for one supplier. A purchase invoice which is given must have exactly one supplier. A supplier may or may not get purchase invoice.

Stored drugs have purchase invoice. Quantities of drugs and total of drug prices depend on purchase invoice. **Batch number** is used uniquely identify a stored drug. When a new supply of drugs is received, **date of entry, quantity, expire and manufacturing dates** are required by pharmacy. A stored drug belongs many purchase invoices and a purchase invoice has many drugs. A stored drug must belong exactly one purchase invoice and a purchase invoice must have exactly one stored drug.

Stored drugs have drug details. Drug details depend on stored drug. **Drug’s name, scientific name, category, storage temperature,** **number of units in package, unit price, storage location, manufacturer** is recorded by pharmacy. A stored drug has many drug details. In a stored drug, must have exactly one drug detail.

Another service is done by employees is write sale invoice for customers. They include **sale invoice id, date, total** **amount, payment type, discounts, paid amount, and remaining amount** in their sale invoice. An employee can write many sale invoices and a sale invoice is written by one employee. A sale invoice which is written must have exactly one employee. Many sale invoices are written for one customer. A sale invoice which is given must have exactly one customer. A customer may or may not get sale invoice. Stored drugs have sale invoices. Quantities of drugs and total of drug prices depend on sale invoice.

**ER Diagram of the database:**

M

SaleInvoice



Writes

N

M

OnSale

Invoice

M

OnPurchase

Invoice

M

DrugDetail

1

N

1

M

StoredDrug

M

1

1

M

PurchaseInvoice

M

For

Supplier

M

Writes

Adds

Customer

Adds

1

1

Employee

Has

1



for



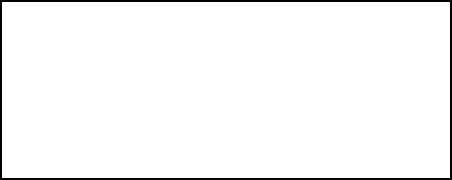
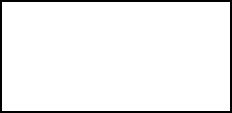
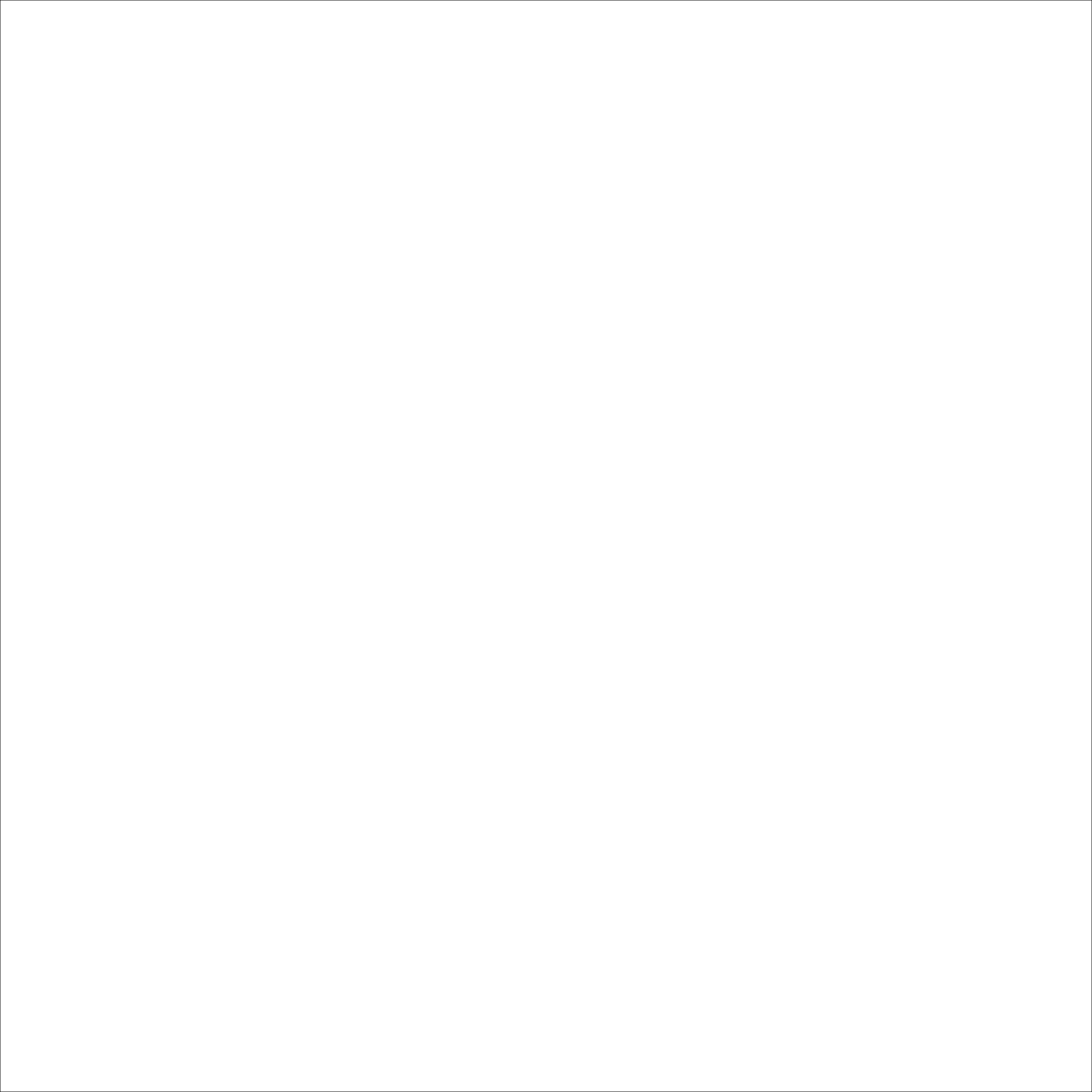
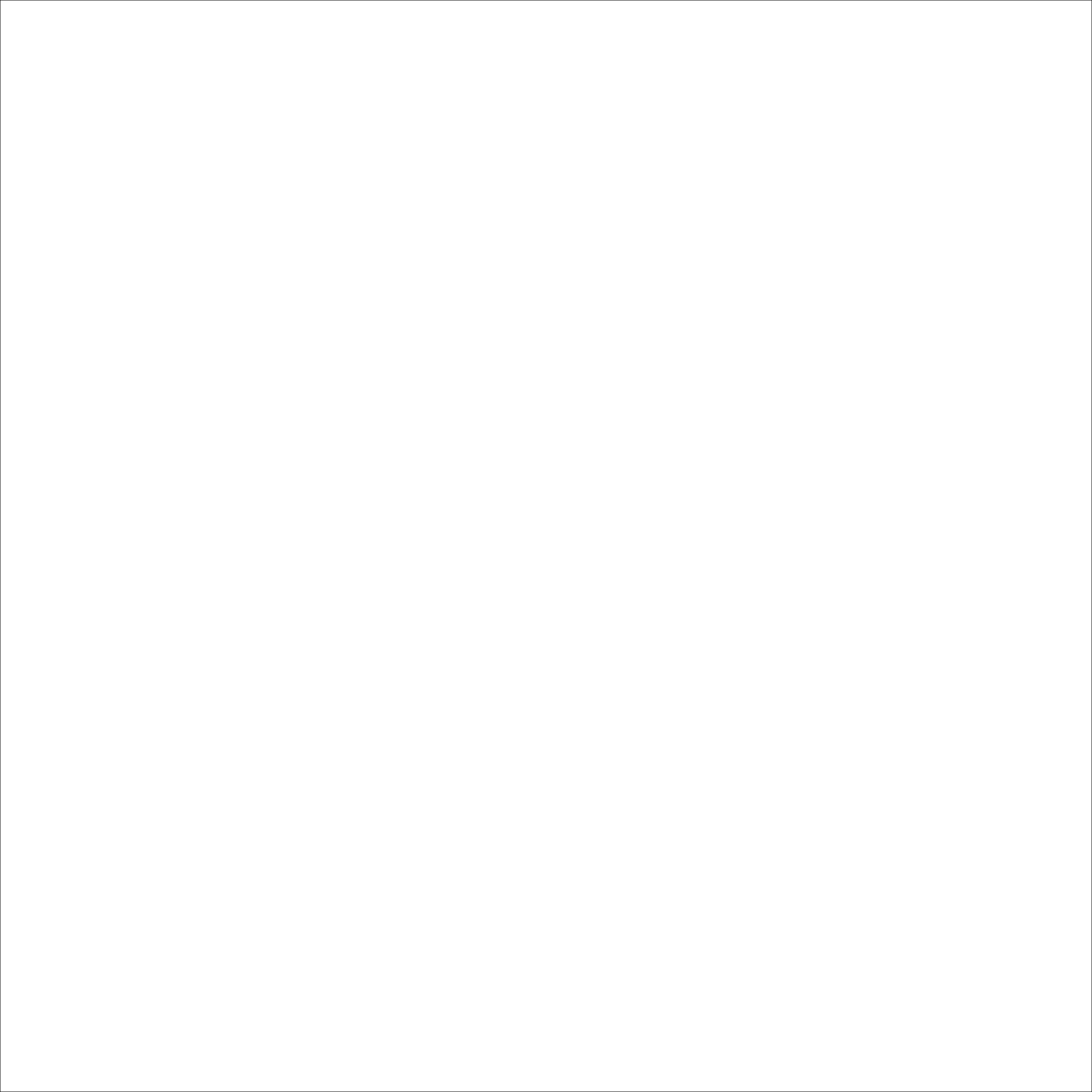
**Relational Data Model of the database:**



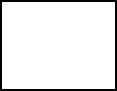
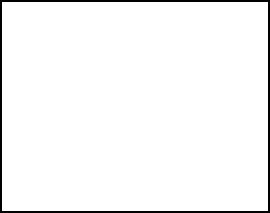
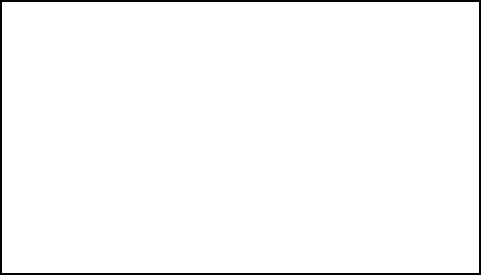
**EMPLOYEE(EmpId,**FirstName,LastName,SurName,Salary,Role,DateOfWork,Address)



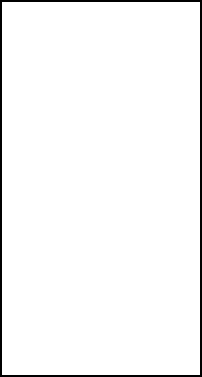
**MOBILENUM(EMPID,CUSID,SUPID,Mobile)**



**CUSTOMER(CusId,**CName,HomeNum,Street,City,**EMPID)**



**SALEINVOICE(SInvoiceId,**Date,TAmount,PayType,RemAmount, PAmount,Discount, **EMPID** ,



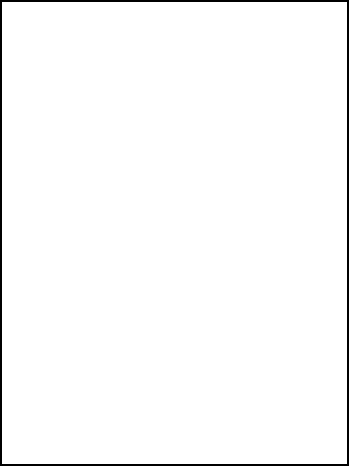
**CUSID)**

**SUPPLIER(SupId,**CompanyName,Address,**EMPID)**

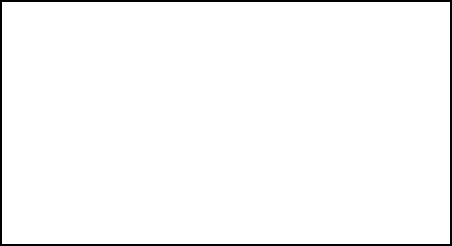


**PURCHASEINVOICE(PInvoiceId,**Date,TAmount,PAmount,PayType,RemAmount,Date**,SUPID,**

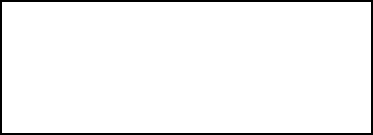
**EMPID)**



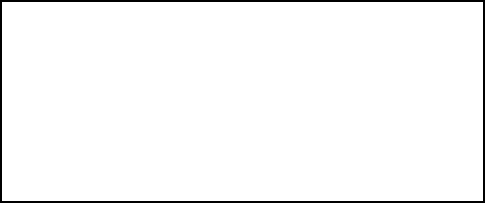
**STOREDDRUG(BatchNo,**ManuDate,ExpDate,DateOfEntry,Quantity**)**



**DRUGDETAIL(DRUGID,BATCHNO,**,Manufacturer,DName,SName,Category,Temp,NoOfUnit,



UPrice,Location**)**



**ONPURCHASEINVOICE(**DQuantity,DPriceTotal**,BATCHNO,PINVOICEID)**

**ONSALEINVOICE(**DQuantity,DPriceTotal,**SIONVOICEID,BATCHNO)**

**SQL Commands to create database tables:**

**Create Employee Table**

CREATE TABLE Emlpoyee

(

EmpId VARCHAR(10) PRIMARY KEY ,

FirstName VARCHAR(15) NOT NULL,

LastName VARCHAR(15) NOT NULL,

SurName VARCHAR(15) DEFAULT NULL,

Role VARCHAR(12) DEFAULT 'Pharmacist',

Salary REAL NOT NULL,

DateOfWork INTEGER DEFAULT 1,

Address VARCHAR(15) DEFAULT 'Malabe'

);

**Create Customer Table**

CREATE TABLE Customer

(

CusId VARCHAR(10) PRIMARY KEY,

EmpId VARCHAR(10) ,

CName VARCHAR(15) NOT NULL,

HomeNum VARCHAR(10),

Street VARCHAR(20),

City VARCHAR(10),

CONSTRAINT fk\_cusr FOREIGN KEY(EmpId) REFERENCES Employee(EmpId)

);

**Create SaleInvoice Table**

CREATE TABLE SaleInvoice

(

SInvoiceId VARCHAR(10) PRIMARY KEY,

EmpId VARCHAR(10),

CusId VARCHAR(10),

TAmount NUMERIC NOT NULL,

RemAmount NUMERIC DEFAULT 0.00,

PAmount NUMERIC CHECK(PAmount>0) ,

Discount NUMERIC DEFAULT 10.00 ,

PayType CHAR(10) DEFAULT 'CASH',

Date INTEGER NOT NULL,

CONSTRAINT fk\_sale FOREIGN KEY(EmpId) REFERENCES Employee(EmpId),

CONSTRAINT fk\_sale2 FOREIGN KEY(CusId) REFERENCES Customer(CusId)

);

**Create Supplier Table**

CREATE TABLE Supplier

(

EmpId VARCHAR(10),

SupId VARCHAR(10) PRIMARY KEY ,

CompanyName VARCHAR(15) NOT NULL,

Address VARCHAR(15) ,

CONSTRAINT fk\_supp FOREIGN KEY(EmpId) REFERENCES Emp(EmpId)

);

**Create PurchaseInvoice Table**

CREATE TABLE PurchaseInvoice

(

EmpId VARCHAR(10),

SupId VARCHAR(10),

PInvoiceId VARCHAR(10) PRIMARY KEY,

TAmount NUMERIC NOT NULL,

RemAmount NUMERIC DEFAULT 0.00 ,

PAmount NUMERIC NOT NULL ,

Discount NUMERIC DEFAULT 10.00,

PayType VARCHAR(10) DEFAULT 'CASH',

Date INTEGER NOT NULL,

CONSTRAINT fk\_purchase1 FOREIGN KEY(EmpId) REFERENCES Employee(EmpId),

CONSTRAINT fk\_purchas2 FOREIGN KEY(SupId) REFERENCES Supplier(SupId)

);

**Create StoredDrug Table**

CREATE TABLE StoredDrug

(

BatchNo VARCHAR(5) PRIMARY KEY,

ManuDate INTEGER NOT NULL ,

ExpDate INTEGER ,

DateOfEntry INTEGER NOT NULL,

Quantity INTEGER DEFAULT 50

);

**Create DrugDetail Table**

CREATE TABLE DrugDetail

(

BatchNo VARCHAR(5) ,

DrugId VARCHAR(5) NOT NULL,

Location VARCHAR(10) DEFAULT 'CUB1',

DName VARCHAR(20) UNIQUE,

SName VARCHAR DEFAULT NULL,

Category VARCHAR(10) DEFAULT 'BOTTLES',

Temp FLOAT DEFAULT 5.0 ,

NoOfUnit INTEGER DEFAULT 10,

UPrice NUMERIC,

Manufacturer VARCHAR(10) DEFAULT NULL,

PRIMARY KEY(BatchNo,DrugId),

FOREIGN KEY(BATCHNO) REFERENCES StoredDrug

ON DELETE CASCADE

);

**Create MobileNum Table**

CREATE TABLE MobileNum

(

EmpId VARCHAR(10) DEFAULT NULL,

SupId VARCHAR(10) DEFAULT NULL,

CusId VARCHAR(10) DEFAULT NULL,

Mobile VARCHAR(13) PRIMARY KEY,

CONSTRAINT fk\_mobile1 FOREIGN KEY(EmpId) REFERENCES Emp(EmpId),

CONSTRAINT fk\_mobile2 FOREIGN KEY(CusId) REFERENCES Custo(CusId),

CONSTRAINT fk\_mobile3 FOREIGN KEY(SupId) REFERENCES Supplier(SupId));

**Create OnPurchaseInvoice Table**

CREATE TABLE OnPurchaseInvoice

(

BatchNo VARCHAR(10),

PInvoiceId VARCHAR(5),

DQuantity INTEGER ,

DPriceTotal NUMERIC,

CONSTRAINT fk\_onpurchase1 FOREIGN KEY(BatchNo) REFERENCES

StoredDrug(BatchNo),

CONSTRAINT fk\_onpurchase2 FOREIGN KEY(PInvoiceId) REFERENCES

PurchaseInvoice(PInvoiceId)

);

**Create OnSaleInvoice Table**

CREATE TABLE OnSaleInvoice

(

BatchNo VARCHAR(10) ,

SInvoiceId VARCHAR(5) ,

DQuantity INTEGER ,

DPriceTotal NUMERIC,

CONSTRAINT fk\_onsale1 FOREIGN KEY(BatchNo) REFERENCES

StoredDrug(BatchNo),

CONSTRAINT fk\_onsale2 FOREIGN KEY(SInvoiceId) REFERENCES

SaleInvoice(SInvoiceId)

);

**SQL Commands to insert records for create tables**

**Insert records for Employee table**

* INSERT INTO Employee VALUES('E1','KAMAL', 'PERERA', 'WIDANAGAMA','ASSISTANT', 15000.00, 10, 'Matara');
* INSERT INTO Employee(EmpId,FirstName,LastName,Role,Salary,DateOfWork,Address) VALUES('E2','DINITHI','SANDARUWANI','MANAGER',25000.00,10,'NUWARA');
* INSERT INTO Employee(EmpId,FirstName,LastName,SurName,Salary) VALUES('E3','SADUN','GIMHAN','RATHNAYAKA',1000.00);
* INSERT INTO Employee(EmpId,FirstName,LastName,Salary) VALUES ('E4','WIMAL','PERERA',1000.00);
* INSERT INTO employee VALUES('E5','KASUN', 'PERERA', 'WIDANAGAMA','TECHNICIAN', 15000.00, 10,'MATARA');
* INSERT INTO employee(EmpId,FirstName,LastName,Role,Salary,DateOfWork) VALUES('E6','WIMAL','SANDARUWAN','MANAGER',50000.00,20);
* INSERT INTO Employee(EmpId,FirstName,LastName,SurName,Salary,DateOfWork,Address) VALUES('E7','THARUSHI','SANDARUWANI','WICKRAMANAYAKE',35000.00,22,'MAHARAGAMA');

**Insert records for Customer table**

* INSERT INTO Customer VALUES('C1','E3','SUNIL','NO.1','GALLE\_ROAD','COLOMBO');
* INSERT INTO Customer VALUES('C2','E3','KAMAL','NO.13','MATARA\_ROAD','GALLE');
* INSERT INTO Customer VALUES('C3','E4','AMAL','NO.15','MATARA\_ROAD','GALLE');
* INSERT INTO Customer VALUES('C4','E4','HIRUSHI','NO.26','GALLE\_ROAD','COLOMBO');
* INSERT INTO Customer VALUES('C5','E3','NIPUNI','NO.56','MATARA\_ROAD','GALLE');
* INSERT INTO Customer VALUES('C6','E6','SADUN','NO.67','MATARA\_ROAD','GALLE');
* INSERT INTO Customer VALUES('C7','E6','HIRUNI','NO.67','MATARA ROAD','GALLE');

**Insert records for SaleInvoice table**

* INSERT INTO SaleInvoice VALUES('S1','E3','C2',1500.00,10,1530.00,20,'card',2020-05-06 );
* INSERT INTO SaleInvoice(EmpId,CusId,SInvoiceId,Tamount,RemAmount,PAmount,Date)

VALUES ('E3','C2','S2',1700.00,20,2000.00,2019-07-08 );

* INSERT INTO SaleInvoice(EmpId,CusId,SInvoiceId,Tamount,PAmount,Date)

VALUES ('E5','C3','S3',1000.00,1020.00,2021-07-08 );

* INSERT INTO SaleInvoice(EmpId,CusId,SInvoiceId,Tamount,RemAmount,PAmount,PayType,Date)

VALUES ('E3','C2','S4',2500.00,20,2530.00,'cash',2022-08-08 );

* INSERT INTO SaleInvoice(EmpId,CusId,SInvoiceId,Tamount,PAmount,Date)

VALUES ('E6','C5','S5',1700.00,1900.00,2022-07-20) ;

* INSERT INTO SaleInvoice VALUES('S6','E6','C7',1300.00,20,1400.00,80,'card',2020-05-20 );
* INSERT INTO SaleInvoice VALUES('S7','E6','C7',1800.00,40,1900.00,60,'card',2020-05-22 );

**Insert records for Supplier table**

* INSERT INTO Supplier VALUES('E2','Q1','ABC','BELIATTA');
* INSERT INTO Supplier VALUES('E2','Q2','ABC','BELIATTA');
* INSERT INTO Supplier VALUES('E2','Q3','ABC','BELIATTA');
* INSERT INTO Supplier VALUES('E5','Q4','ERT','MATARA');
* INSERT INTO Supplier VALUES('E5','Q5','ET','GALLE');
* INSERT INTO Supplier VALUES('E2','Q6','AWP','GALLE');
* INSERT INTO Supplier VALUES('E1','Q7','APK','COLOMBO');

**Insert records for PurchaseInvoice table**

* INSERT INTO PurchaseInvoice VALUES('E2','Q1','P1',1500.00,10,1530.00,20,'card',2021-05-06 );
* INSERT INTO PurchaseInvoice(EmpId,SupId,PInvoiceId,Tamount,RemAmount,PAmount,Date)

VALUES ('E1','Q1','P2',1700.00,30,2010.00,2019-07-09);

* INSERT INTO PurchaseInvoice(EmpId,SupId,PInvoiceId,Tamount,PAmount,Date)

VALUES ('E2','Q2','P3',1000.00,1020.00,2021-08-08 );

* INSERT INTO PurchaseInvoice(EmpId,SupId,PInvoiceId,Tamount,RemAmount,PAmount,PayType,Date)

VALUES ('E1','Q1','P4',2500.00,20,2530.00,'cash',2021-08-09 );

* INSERT INTO PurchaseInvoice(EmpId,SupId,PInvoiceId,Tamount,PAmount,Date)

VALUES ('E5','Q3','P5',1700.00,1900.00,2021-07-20 );

* INSERT INTO PurchaseInvoice VALUES('E2','Q3','P6',1300.00,20,1400.00,80,'card',2020-08-20 );
* INSERT INTO PurchaseInvoice VALUES('E2','Q7','P7',1800.00,40,1900.00,60,'card',2022-05-22);

**Insert records for StoredDrug table**

* INSERT INTO StoredDrug VALUES('B1',2020-03-05,2025-08-09,2021-09-16,40);
* INSERT INTO StoredDrug (BatchNo,ManuDate,ExpDate,DateOfEntry)VALUES('B2',2021-07-05,2026-08-09,2022-05-03);
* INSERT INTO StoredDrug (BatchNo,ManuDate,ExpDate,DateOfEntry)VALUES('B3',2021-07-06,2025-10-12,2022-05-03);
* INSERT INTO StoredDrug (BatchNo,ManuDate,ExpDate,DateOfEntry)VALUES('B4',2022-07-05,2026-07-11,2022-05-03);
* INSERT INTO StoredDrug (BatchNo,ManuDate,ExpDate,DateOfEntry)VALUES('B5',2022-07-10,2027-09-09,2022-08-03);
* INSERT INTO StoredDrug VALUES('B6',2020-03-05,2024-08-09,2020-09-16,40);
* INSERT INTO StoredDrug VALUES('B7',2020-03-01,2025-12-09,2021-10-16,60);

**Insert records for DrugDetail table**

* INSERT INTO DrugDetail VALUES('B2','D1','CUB2','PANADOL','PARACETAMOL','PILLS',10.0,50,2.50,'ABC');
* INSERT INTO DrugDetail (BatchNo,DrugId,DName,Location,NoOfUnit,UPrice) VALUES ('B2','D2','COUGH\_SYRUP','CUB2',30,450.00);
* INSERT INTO DrugDetail (BatchNo,DrugId,DName,Manufacturer,UPrice) VALUES ('B3','D3','ANTISEPTIC','CER',580.00);
* INSERT INTO DrugDetail (BatchNo,DrugId,DName,Location,NoOfUnit,UPrice,Temp) VALUES ('B5','D4','EYEDROPS','CUB3',50,150.00,20.0);
* INSERT INTO DrugDetail VALUES('B5','D5','CUB2','CALCIUM','CALCIUM','PILLS',15.0,100,1.50,'ABC');
* INSERT INTO DrugDetail VALUES('B3','D6','CUB5','METFORMIN','1\_1\_DIMETHYL','CAPSULE',10.0,20,2.50,'ABC');
* INSERT INTO DrugDetail (BatchNo,DrugId,DName,Category,UPrice) VALUES ('B5','D7','OMEPRA-ZOLE','CAPSULE',10.00);

**Insert records for MobileNum Table**

* INSERT INTO MobileNum (EmpId,Mobile) VALUES ('E3','077-9452013');
* INSERT INTO MobileNum (EmpId,Mobile) VALUES ('E3','078-9452913');
* INSERT INTO MobileNum (EmpId,Mobile) VALUES ('E2','077-5456013');
* INSERT INTO MobileNum (EmpId,Mobile) VALUES ('E2','076-9462613');
* INSERT INTO MobileNum(SupId,Mobile) VALUES ('Q2','078-5634586');
* INSERT INTO MobileNum(SupId,Mobile) VALUES ('Q2','078-5934786');
* INSERT INTO MobileNum(SupId,Mobile) VALUES ('Q3','078-7674586');
* INSERT INTO MobileNum(SupId,Mobile) VALUES ('Q3','077-6634686');
* INSERT INTO MobileNum(CusId,Mobile) VALUES('C1','071-4029566’);
* INSERT INTO MobileNum(CusId,Mobile) VALUES('C1','071-4069566’);
* INSERT INTO MobileNum(CusId,Mobile) VALUES('C6','077-4029066');
* INSERT INTO MobileNum(CusId,Mobile) VALUES('C6','071-4529566');

**Insert records for OnPurchaseInvoice table**

* INSERT INTO OnPurchaseInvoice VALUES('B1','P1',100,5000.00);
* INSERT INTO OnPurchaseInvoice VALUES('B1','P2',50,7000.00);
* INSERT INTO OnPurchaseInvoice VALUES('B1','P3',40,8000.00);
* INSERT INTO OnPurchaseInvoice VALUES('B2','P1',10,7000.00);
* INSERT INTO OnPurchaseInvoice VALUES('B2','P2',10,5800.00);

**Insert records for OnSaleInvoice table**

* INSERT INTO OnSaleInvoice VALUES('B1','S1',10,500.00);
* INSERT INTO OnSaleInvoice VALUES('B1','S2',5,700.00);
* INSERT INTO OnSaleInvoice VALUES('B1','S3',4,8000.00);
* INSERT INTO OnSaleInvoice VALUES('B2','S1',1,70.00);
* INSERT INTO OnSaleInvoice VALUES('B6','S2',10,580.00);

**What the user can find in this database?**

* /\*Select all customer ids from sale invoice table\*/

SELECT ALL CusId FROM SaleInvoice;

* /\*Select customer names from customer table\*/

SELECT CName FROM Customer;

* /\*Select all purchase invoice ids which total amount greater than 1000 and paid amount greater than 2000\*/

SELECT PInvoiceId

FROM PurchaseInvoice

WHERE TAmount>1000 AND PAmount>2000;

* /\* Select batch numbers their drug price totals are betwween 7,000 and 8,500\*/

SELECT BatchNo

FROM OnPurchaseInvoice

WHERE DPriceTotal BETWEEN 7000 AND 8500;

* /\*list all the first names of employees their surnames are unknown\*/

SELECT FirstName

FROM Employee

WHERE SurName is NULL;

* /\*List all the supplier ids who are in Beliatta \*/

SELECT SupId

FROM Supplier

WHERE Address='BELIATTA';

* /\*Select details about all employees\*/

SELECT \* FROM Employee;

* /\*All details about mobile number= '071-4029566' \*/

SELECT \* FROM MobileNum

WHERE Mobile IN ('071-4029566');

* /\*Select id of employee starting with 'SAND' and ending with another one letter\*/

SELECT EmpId

FROM Employee

WHERE LastName LIKE 'SANDARUWA\_';

* /\*List batch numbers according to the assending order of drug's manufacture dates\*/

SELECT BatchNo

FROM StoredDrug

ORDER BY ManuDate ASC;

* /\*Count different number of units in drugs\*/

SELECT COUNT (DISTINCT NoOfUnit)

FROM DrugDetail;

* /\*Select first names of the employee, employee will be given a fixed allowance of Rs.20,000 what is the Net salary of each employee\*/

SELECT FirstName ,(Salary+20,000) AS “Net Salary”

FROM Employee;

* /\*Select minimum price of unit price in drugs\*/

SELECT Min(UPrice)

FROM DrugDetail;

* /\*list the different working days of employees \*/

SELECT DISTINCT DateOfWork

FROM Employee;

* /\*list the different working days of employees \*/

SELECT DISTINCT DateOfWork

FROM Employee;

* /\*list the number of suppliers in each locations\*/

SELECT COUNT (SupId) AS "Number of suppliers"

FROM Supplier

GROUP BY Address;

* /\*list employee id and the number of employees who adds customer, each employee id only if the number of employees is greater than 2'\*/

SELECT COUNT(EmpId) AS "Number of employees"

FROM Customer

GROUP BY EmpId

HAVING COUNT(EmpId)>2;

* /\*Find total price of a panadol packet \*/

SELECT SUM(UPrice\*NoOfUnit)

FROM DrugDetail

WHERE DName='PANADOL' ;