Information Systems and Data Modeling – IT1090

Assignment

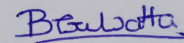| Title: Online Pharmacy Portal	
Batch Number: Y1 S1 WD IT 1.1	Group Number: MLB_01.01_03

Declaration:

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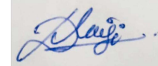
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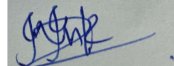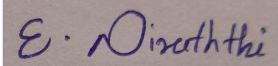
Submitted on: <03/06/2023>

1. Hypothetical Scenario

Gateway Medical is an online pharmacy system where users can purchase medicine online and have it delivered to their homes. There are two main categories of users who can access the system, guest users and registered users. The system allows the guests to view the website and the available medicine, but the users must register to the system to buy medicine.

Registered users are able to search medicines by category, purchase medicine, maintain their user profiles, and give feedback. The user should upload a valid prescription before they buy medicine, and a pharmacist should verify the prescription for the order to be confirmed. The user should choose their payment method and enter the required banking details and other details such as the delivery address to place the order. The system verifies the details and sends a message confirming the order. Then the order will be packed by a pharmacist and delivered to the users by a delivery person. All the medicine in the pharmacy is managed by the pharmacy manager.

2. Requirements Analysis Document

2.1. Functional Requirements

1) User

- Users must be able to register for an account with the online pharmacy system.
- Users must be able to manage their account information, including their password, address, and payment information.
- Users must be able to upload their prescriptions.
- Users must be able to place their orders.
- Users must be able to receive their orders.

2) Employee

- The manager must be able to track the inventory of all medications in the pharmacy.
- The manager must be able to manage their account information, including their password, address, and payment information.
- The manager must be able to manage feedback and FAQs.

3) Pharmacist

- Pharmacists must be able to manage their account information, including their passwords, address, and payment information.
- Pharmacists must be able to verify prescriptions.
- Pharmacists must be able to pack medicines.

4) Delivery person

- The delivery person must be able to return to the pharmacy with any undelivered orders.

- The delivery person must be able to deliver the order to the customer on time.

- The delivery person must be able to select an order and view the details of the order, including the address of the delivery location.

- The delivery person must be able to access the system to view orders that are ready for delivery.

5) System

- The system must allow new registrations.
- The system must be able to check the validity of login details.
- The system must store all the user and employee details.
- The system must store the payment details and check the validity of the payment details.

2.2. Non-functional Requirements

The features and characteristics that are crucial for the system's performance, usability, security, scalability, and other factors are referred to as non-functional requirements for an online pharmacy portal. Non-functional requirements for an online pharmacy portal are shown below:

- **Performance**

  In this system, customers need to visit the website swiftly and carry out tasks like looking for medicine, placing orders, and paying bills. In that case, the system process quickly and responds so as not to take too long time.

- **Usability**

  The portal needs to be user-friendly, offering a simple and intuitive layout that makes it possible for users to navigate with ease, obtain the needed data, and complete orders without difficulty.

- **Reliability**

  The system should be extremely dependable, able to manage several concurrent users without crashing, losing data, or experiencing service interruptions, and work regularly.

- **Security**

  Sensitive user information, such as personal information, medical information, and payment data, should be protected by the portal using strong security methods. To maintain the confidentiality and integrity of user data, it should have strong encryption methods, authentication techniques, and frequent security assessments.

- **Scalability**

  The system must be scalable to handle future increases in user demand and traffic. It needs to be able to manage an increasing volume of orders, users, and transactions without noticeably degrading its performance.

- **Compatibility**

  The online pharmacy portal should work with a variety of hardware and operating systems, including tablets, smartphones, and desktop computers, so consumers may visit the portal from numerous platforms without encountering any compatibility problems.

- **Compliance**

  Regarding the sale and delivery of pharmaceutical items, the online pharmacy portal should abide by all pertinent laws, rules, and standards of the industry, including those governing data privacy and healthcare.

- **Maintainability**

  To facilitate simple updates, bug repairs, and future improvements, the system should be constructed and structured in a modular and maintainable manner. It should have adequate documentation and clean code to make continuing support and maintenance easier.

3. Data Requirements

The online pharmacy system has the following data requirement when designing the database.

Employee table

- Employee ID (EID)
- Employee name (Name)
- Employee position (Position)
- Employee address (Address)
- Employee contact number (Contact_No)
- Employee NIC (NIC)

EID is the primary key.

Contact_No is a multivalued attribute that will be separated into a table called Employee_Contact.

Prescription table

- Prescription ID (PID)
- Dosage (Dosage)
- Medicine name (Med_Name)

PID is the primary key.

Users table

- User ID (UID)
- User name (Name)
- User address (Address)
- User NIC (NIC)
- User contact number (Contact_No)

UID is the primary key.

Contact_No is a multivalued attribute that will be separated into a table called User_Contact.

Account table

- Account username (Username)
- Account email address (Email)
- Account password (Password)

Username and Password are primary key.

Orders table

- Order ID (OID)
- Payment method (Payment_Method)
- Delivery address (Delivery_ Address)
- Total amount (Tot_Amount)

OID is the primary key.

Medicine table

- Medicine ID (MID)
- Expiry date (Exp_Date)
- Medicine quantity (Quantity)
- Medicine supplier (Supplier)
- Medicine price (Price)
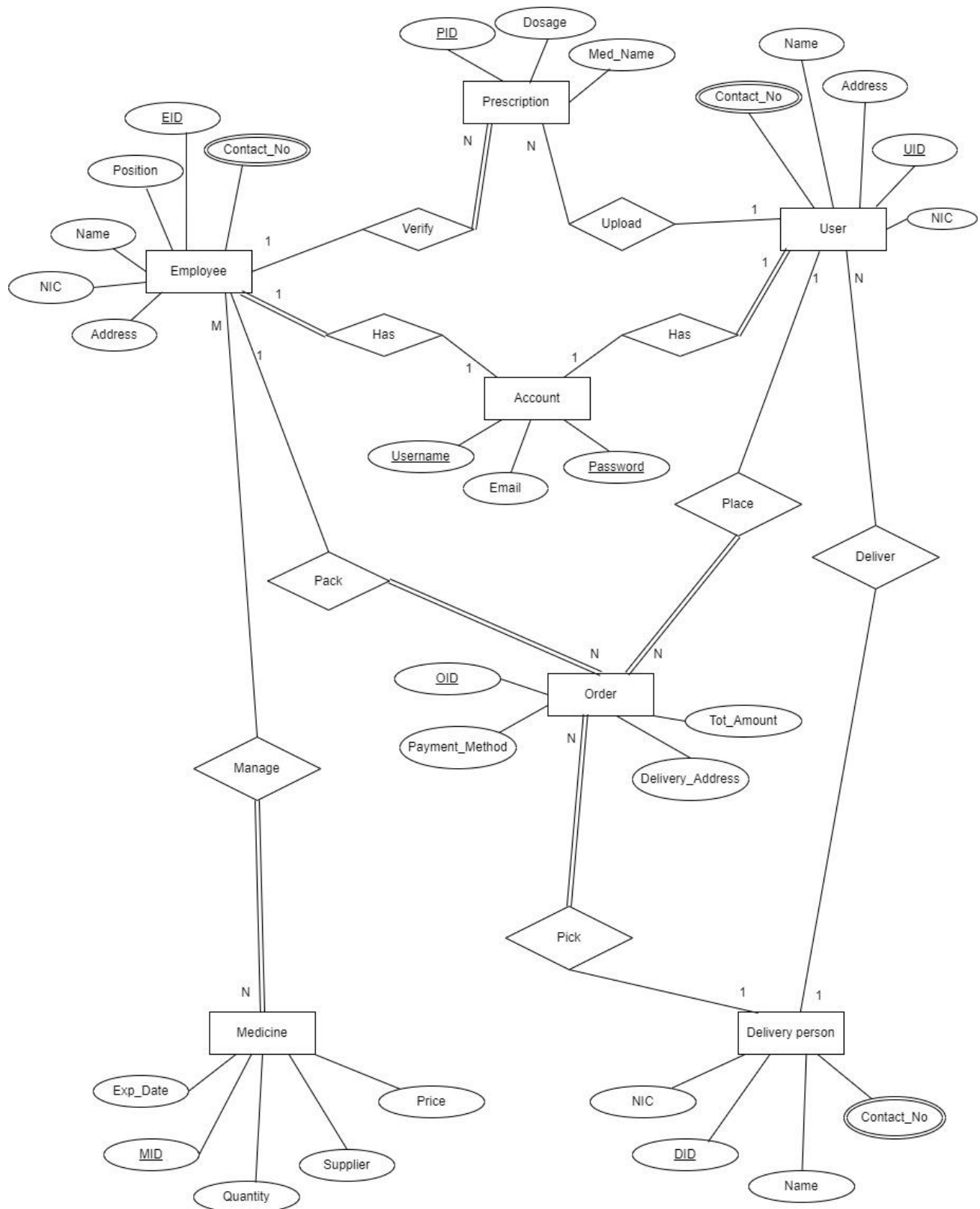
MID is the primary key.

Delivery Person table

- Delivery person ID (DID)
- Delivery person NIC (NIC)
- Delivery person name (Name)
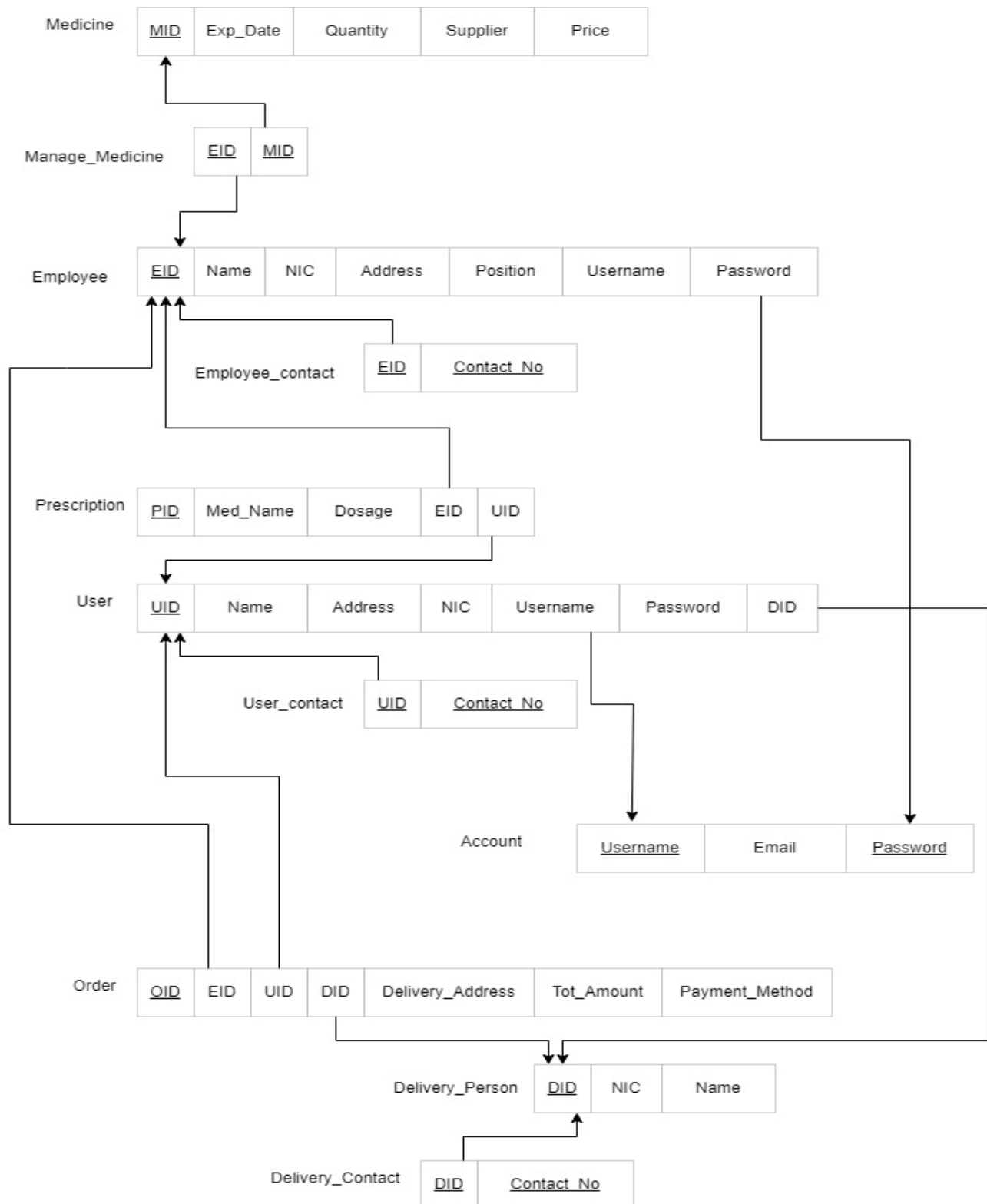- Delivery person contact number (Contact_No)

DID is the primary key.

Contact_No is a multivalued attribute that will be separated into a table called Delivery_Contact.

4. ER Diagram

5. Relational Schema

Medicine

MID	Exp_Date	Quantity	Supplier	Price

Manage_Medicine

EID	MID

Employee

EID	Name	NIC	Address	Position	Username	Password

Employee_contact

EID	Contact_No

Prescription

PID	Med_Name	Dosage	EID	UID

User

UID	Name	Address	NIC	Username	Password	DID

User_contact

UID	Contact_No

Account

Username	Email	Password

Order

OID	EID	UID	DID	Delivery_Address	Tot_Amount	Payment_Method

Delivery_Person

DID	NIC	Name

Delivery_Contact

DID	Contact_No

6. SQL Commands

6.1. Create Database

CREATE DATABASE OnlinePharmacy;

Medicine table

```
CREATE TABLE Medicine (
MID char(5) NOT NULL,
Quantity int,
Supplier varchar(50) NOT NULL,
Exp_date Date,
Price int,
PRIMARY KEY (MID)
);
```

Manage_Medicine table

```
CREATE TABLE Manage_Medicine (
EID char(5) NOT NULL,
MID char(5) NOT NULL,
CONSTRAINT PK_Manage_Medicine PRIMARY KEY (EID, MID),
CONSTRAINT FK_M_Medicine1 FOREIGN KEY (EID) REFERENCES Employee (EID),
CONSTRAINT FK_M_Medicine2 FOREIGN KEY (MID) REFERENCES Medicine (MID)
);
```

Employee table

```
CREATE TABLE Employee (
EID char(5) NOT NULL,
Name varchar(100) NOT NULL,
NIC varchar(20) NOT NULL,
```

Address varchar(200) NOT NULL,

Position varchar(20) NOT NULL,

Username varchar(50) NOT NULL,

Password varchar(10) NOT NULL,

PRIMARY KEY (EID),

CONSTRAINT FK_Employee FOREIGN KEY (Username, Password) REFERENCES Account

(Username, Password)

);

Employee_Contact table

CREATE TABLE Employee_Contact (

EID char(5) NOT NULL,

Contact_No int NOT NULL,

CONSTRAINT PK_Employee_Contact PRIMARY KEY (EID, Contact_No),

CONSTRAINT FK_E_Contact FOREIGN KEY (EID) REFERENCES Employee (EID)

);

Prescription table

CREATE TABLE Prescription (

PID char(5) NOT NULL,

Med_Name varchar(100) NOT NULL,

Dosage char(20) NOT NULL,

UID char(5) NOT NULL,

EID char(5) NOT NULL,

PRIMARY KEY (PID),

CONSTRAINT FK_Prescription1 FOREIGN KEY (UID) REFERENCES Users (UID),

CONSTRAINT FK_Prescription2 FOREIGN KEY (EID) REFERENCES Employee (EID)

);

Users table

```
CREATE TABLE Users (
UID char(5),
Name varchar(100) NOT NULL,
NIC varchar(20) NOT NULL,
Address varchar(200) NOT NULL,
Username varchar(50) NOT NULL,
Password varchar(10) NOT NULL,
DID char(5) NOT NULL,
PRIMARY KEY (UID),
CONSTRAINT FK_Users1 FOREIGN KEY (Username, Password) REFERENCES Account
(Username, Password),
CONSTRAINT FK_Users2 FOREIGN KEY (DID) REFERENCES Delivery_Person (DID)
);
```

User_Contact table

```
CREATE TABLE User_Contact (
UID char(5) NOT NULL,
Contact_No int NOT NULL,
CONSTRAINT PK_User_Contact PRIMARY KEY (UID, Contact_No),
CONSTRAINT FK_U_Contact FOREIGN KEY (UID) REFERENCES Users (UID)
);
```

Account table

```
CREATE TABLE Account (
Username varchar(50) NOT NULL,
Password varchar(10) NOT NULL,
Email varchar(100) NOT NULL,
CONSTRAINT PK_Account PRIMARY KEY (Username, Password)
);
```

Orders table

```sql
CREATE TABLE Orders (
OID char(5) NOT NULL,
Payment_Method varchar(50) NOT NULL,
Delivery_Address varchar(200) NOT NULL,
Tot_Amount float NOT NULL,
EID char(5) NOT NULL,
UID char(5) NOT NULL,
DID char(5) NOT NULL,
PRIMARY KEY (OID),
CONSTRAINT FK_Orders1 FOREIGN KEY (EID) REFERENCES Employee (EID),
CONSTRAINT FK_Orders2 FOREIGN KEY (UID) REFERENCES Users (UID),
CONSTRAINT FK_Orders3 FOREIGN KEY (DID) REFERENCES Delivery_Person (DID)
);
```

Delivery_Person table

```sql
CREATE TABLE Delivery_Person (
DID char(5) NOT NULL,
Name varchar(100) NOT NULL,
NIC varchar(20) NOT NULL,
PRIMARY KEY (DID)
);
```

Delivery_Contact table

```sql
CREATE TABLE Delivery_Contact (
DID char(5) NOT NULL,
Contact_No int NOT NULL,
CONSTRAINT PK_Delivery_Contact PRIMARY KEY (DID, Contact_No),
CONSTRAINT FK_D_Contact FOREIGN KEY (DID) REFERENCES Delivery_Person (DID)
);
```

6.2. Insert Data

Medicine table

INSERT INTO Medicine VALUES ('M0010', '200', 'Perera', '2023-11-15', '700');
INSERT INTO Medicine VALUES ('M0011', '300', 'Madhu', '2025-02-25', '900');
INSERT INTO Medicine VALUES ('M0012', '200', 'Perera', '2023-10-11', '400');
INSERT INTO Medicine VALUES ('M0013', '400', 'Sunil', '2026-05-11', '1500');
INSERT INTO Medicine VALUES ('M0014', '500', 'Kumara', '2025-05-11', '3500');

Manage_Medicine table

INSERT INTO Manage_Medicine VALUES ('E0010', 'M0010');
INSERT INTO Manage_Medicine VALUES ('E0011', 'M0011');
INSERT INTO Manage_Medicine VALUES ('E0010', 'M0012');
INSERT INTO Manage_Medicine VALUES ('E0010', 'M0013');
INSERT INTO Manage_Medicine VALUES ('E0011', 'M0014');

Employee table

INSERT INTO Employee VALUES ('E0010', 'Amara Weerasinga', '9135782936', '155 Prince Street, Colombo', 'Manager', 'Amara', 'A1123w');
INSERT INTO Employee VALUES ('E0011', 'Nimal Ratna', '8893746283', '164/B, Kirulapone Avenue, Colombo', 'Manager', 'Nimal', 'NRimal12');
INSERT INTO Employee VALUES ('E0012', 'Buddhika Perera', '7482649274', '53, Alpitiya Rd. Ambalangoda', 'Pharmacist', 'Buddhika', 'Buddhi99');
INSERT INTO Employee VALUES ('E0013', 'Isuri Fernando', '9674629465', '87C, High Level Plaza, Delkanda', 'Pharmacist', 'Isuri', 'IS746');
INSERT INTO Employee VALUES ('E0014', 'Sanjeewa Amaratunga', '7035755372', '26, Quarry Road, Colombo', 'Pharmacist', 'Sanjeewa', 'San$$');

Employee_Contact table

INSERT INTO Employee_Contact VALUES ('E0010', '0714498896');

INSERT INTO Employee_Contact VALUES ('E0011', '0712634569');

INSERT INTO Employee_Contact VALUES ('E0012', '0704531472');

INSERT INTO Employee_Contact VALUES ('E0013', '0778374839');

INSERT INTO Employee_Contact VALUES ('E0014', '0775852846');

Prescription table

INSERT INTO Prescription VALUES ('P0010', 'Acetaminophen', '325mg', 'U0010', 'E0012');

INSERT INTO Prescription VALUES ('P0011', 'Jardiance', '10mg', 'U0011', 'E0012');

INSERT INTO Prescription VALUES ('P0012', 'Cyclobenzaprine', '100mg', 'U0012', 'E0013');

INSERT INTO Prescription VALUES ('P0013', 'Doxycycline', '350mg', 'U0013', 'E0013');

INSERT INTO Prescription VALUES ('P0014', 'Benzonatate', '10mg', 'U0014', 'E0014');

Users table

INSERT INTO Users VALUES ('U0010', 'Salinda Madhubashana', '199378986632', 'NO 20, Wawa Road, Anuradapura', 'Salinda', 'Salinda123', 'D0010');

INSERT INTO Users VALUES ('U0011', 'Wishwa Jayasekara', '199078277352', '12/B, Welivita Road, Malabe', 'Wishwa', 'Wish888', 'D0011');

INSERT INTO Users VALUES ('U0012', 'Sachini Gunasekare', '200392677863', 'NO 450, Mallika Road, Kandy', 'Sachini', 'sach11', 'D0012');

INSERT INTO Users VALUES ('U0013', 'Sashika Sadruwan', '200078096630', 'NO 30, Wawala Road, Moratuwa', 'Sashika', 'ShaShi', 'D0013');

INSERT INTO Users VALUES ('U0014', 'Lakmini Wijesuriya', '199778092835', '45/b, Meennana, Eheliyagoda', 'Lakmini', 'lak45', 'D0014');

User_Contact table

INSERT INTO User_Contact VALUES ('U0010', '0717383748');
INSERT INTO User_Contact VALUES ('U0011', '0729748274');
INSERT INTO User_Contact VALUES ('U0012', '0719476567');
INSERT INTO User_Contact VALUES ('U0013', '0778473624');
INSERT INTO User_Contact VALUES ('U0014', '0708367539');

Account table

INSERT INTO Account VALUES ('Sachini', 'sach11', 'Sachini@gmail.com');
INSERT INTO Account VALUES ('Wishwa', 'Wish888', 'Wishwajay@gmail.com');
INSERT INTO Account VALUES ('Lakmini', 'lak45', 'Lakmini@gmail.com');
INSERT INTO Account VALUES ('Salinda', 'Salinda123', 'Salinda@gmail.com');
INSERT INTO Account VALUES ('Sashika', 'ShaShi', 'Sashika@gmail.com');
INSERT INTO Account VALUES ('Amara', 'A1123w', 'amara.weera@gmail.com');
INSERT INTO Account VALUES ('Nimal', 'NRimal12', 'ratna.nimal@gmail.com');
INSERT INTO Account VALUES ('Buddhika', 'Buddhi99', 'Buddhika@gmail.com');
INSERT INTO Account VALUES ('Isuri', 'IS746', 'Isuri@gmail.com');
INSERT INTO Account VALUES ('Sanjeewa', 'San$$', 'Sanjeewa@gmail.com');

Orders table

INSERT INTO Orders VALUES ('O0010', 'Paypal', 'NO 20, Wawa Road, Anuradapura', '1250.00', 'E0014', 'U0010', 'D0010');
INSERT INTO Orders VALUES ('O0011', 'AMEX', '12/B, Welivita Road, Malabe', '450.70', 'E0012', 'U0011', 'D0011');
INSERT INTO Orders VALUES ('O0012', 'Paypal', 'NO 450, Mallika Road, Kandy', '890.60', 'E0012', 'U0012', 'D0012');
INSERT INTO Orders VALUES ('O0013', 'Paypal', 'NO 30, Wawala Road, Moratuwa', '875.00', 'E0013', 'U0013', 'D0013');
INSERT INTO Orders VALUES ('O0014', 'AMEX', '45/b, Meennana, Eheliyagoda', '4500.20', 'E0014', 'U0014', 'D0014');

Delivery_Person table

```sql
INSERT INTO Delivery_Person VALUES ('D0010', 'Saman Kumara', '199778000632');
INSERT INTO Delivery_Person VALUES ('D0011', 'Rusiru Lakshan', '19902356855');
INSERT INTO Delivery_Person VALUES ('D0012', 'Surith Madushanka', '2002582029');
INSERT INTO Delivery_Person VALUES ('D0013', 'Kasun Sudheera', '19805226387');
INSERT INTO Delivery_Person VALUES ('D0014', 'Sanka Sineth', '19968545263');
```

Delivery_Contact table

```sql
INSERT INTO Delivery_Contact VALUES ('D0010', '0714456896');
INSERT INTO Delivery_Contact VALUES ('D0011', '0752234569');
INSERT INTO Delivery_Contact VALUES ('D0012', '0702231212');
INSERT INTO Delivery_Contact VALUES ('D0013', '0778523249');
INSERT INTO Delivery_Contact VALUES ('D0014', '0705851436');
```

7. Special Performance Considerations

- The portal's swift reaction time guarantees a seamless user experience. Pages of the website should load quickly, and processes like looking for prescription medicines, adding items to a cart, and checking out should go without any observable delays.

- The system must be used at anytime and anywhere.

- The system's user-friendly interface makes it simple for customers to use, and downtime should be kept to a minimum to sustain continuous service.

- Products are accurately and appropriately categorized.

- An effective search engine is necessary for an online pharmacy because Pharmaceuticals should be quickly and precisely found by users utilizing several search criteria (such as name, brand, or illness).

- Ability to access the system from any browser.

- The payment and transaction processing system needs to be trustworthy and secure. It should efficiently manage online payments and integrate with well-known payment gateways. Customers should get order confirmations and real-time status updates from the system.

8. Special Security Requirements

- Implement a reliable user authentication system to confirm the users' identities when they access the portal. Combinations of username and password may be included.

- The website and the user's browser are connected securely. This guarantees secrecy and guards against the interception of data sent across the network.

- Implement strong password regulations, such as those requiring password complexity and routine password changes.

- Sensitive user data, including personal information, medical history, and financial information, should be encrypted by the system both at rest and while in transit.

- The system ought to Use safe payment gateways that have been verified and trusted to manage online transactions. Do not keep financial or credit card information on the site.

- Assuring adherence to applicable data protection laws, the online pharmacy portal's privacy policy is precisely defined and communicated.