SQL Developer Internship - Task 1 Completion

Part 1: Database Setup and Schema Design

Domain: E-commerce (Online Shopping System)

Entities:

• Customer: Stores user/buyer information.

• Product: Stores details about items for sale.

• Order: Stores details about a specific purchase transaction.

• OrderItem: Links Order and Product with item-specific details.

SQL Schema Script:

```
-- SQL Script for E-commerce Database Schema

CREATE DATABASE IF NOT EXISTS EcommerceDB;
USE EcommerceDB;

CREATE TABLE Customer (
CustomerID INT AUTO_INCREMENT,
FirstName VARCHAR(100) NOT NULL,
LastName VARCHAR(100) NOT NULL,
Email VARCHAR(255) UNIQUE NOT NULL,
Phone VARCHAR(15),
Address TEXT,
PRIMARY KEY (CustomerID)
);

CREATE TABLE Product (
ProductID INT AUTO_INCREMENT,
Name VARCHAR(255) NOT NULL,
Description TEXT,
```

```
Price DECIMAL(10, 2) NOT NULL,
StockQuantity INT NOT NULL DEFAULT 0,
PRIMARY KEY (ProductID)
);

CREATE TABLE `Order` (
OrderID INT AUTO_INCREMENT,
CustomerID INT NOT NULL,
OrderDate DATETIME NOT NULL DEFAULT CURRENT_TIMESTAMP,
TotalAmount DECIMAL(10, 2) NOT NULL,
OrderStatus ENUM('Pending', 'Shipped', 'Delivered', 'Canceled') NOT NULL DEFAULT 'Pending',
PRIMARY KEY (OrderID),
FOREIGN KEY (CustomerID) REFERENCES Customer(CustomerID)
ON DELETE RESTRICT
ON UPDATE CASCADE
);

CREATE TABLE OrderItem (
OrderItemID INT AUTO_INCREMENT,
OrderID INT NOT NULL,
ProductID INT NOT NULL,
Quantity INT NOT NULL,
PriceAtPurchase DECIMAL(10, 2) NOT NULL,
PRIMARY KEY (OrderItemID),
UNIQUE KEY (OrderID, ProductID),
FOREIGN KEY (OrderID) REFERENCES `Order`(OrderID)
ON DELETE CASCADE
ON UPDATE CASCADE,
FOREIGN KEY (ProductID) REFERENCES Product(ProductID)
```

```
ON DELETE RESTRICT

ON UPDATE CASCADE

);

CREATE INDEX idx_order_status ON `Order`(OrderStatus);
```

Part 2: Key Concepts Explanation

Normalization:

A process of organizing database tables to reduce redundancy and avoid anomalies.

Primary vs Foreign Key:

• Primary Key: Uniquely identifies each record.

• Foreign Key: References a primary key in another table to create relationships.

Constraints:

Rules applied on table columns such as NOT NULL, UNIQUE, PRIMARY KEY, FOREIGN KEY, CHECK, DEFAULT.

Surrogate Key:

A system-generated identifier with no business meaning.

Avoiding Data Redundancy:

Achieved using normalization and establishing correct relationships via foreign keys.

ER Diagram:

A visual representation of tables and relationships in a database.

Types of Relationships:

• One-to-One

• One-to-Many

• Many-to-Many (resolved using junction tables)

AUTO_INCREMENT:

Automatically generates unique sequential values for primary keys.

Default Storage Engine in MySQL:

InnoDB – supports transactions, foreign keys, and row-level locking.

Composite Key:

A primary key composed of multiple columns whose combination uniquely identifies a record.