

Relational Schema with Integrity Constraints

1. Customer –

Schema: **customerID**, name (first_name, last_name), address (street, city, state, pincode), phone_no, email, password, dob, age(), gender

| | |
|------------|--------------------------------------|
| customerID | INT AUTO_INCREMENT PRIMARY KEY |
| first_name | VARCHAR(50) NOT NULL |
| last_name | VARCHAR(50) |
| street | VARCHAR(100) NOT NULL |
| city | VARCHAR(50) NOT NULL |
| state | VARCHAR(50) NOT NULL |
| pincode | INT NOT NULL |
| phone_no | BIGINT UNIQUE NOT NULL |
| email | VARCHAR(100) UNIQUE NOT NULL |
| password | VARCHAR(50) NOT NULL |
| dob | DATE |
| age | INT |
| gender | VARCHAR(10) |

2. Admin –

Schema: **adminID**, password

| | |
|----------|--------------------------------------|
| adminID | INT AUTO_INCREMENT PRIMARY KEY |
| password | VARCHAR(50) NOT NULL |

3. ProductCategory –

Schema: **categoryID**, name, noOfProducts

| | |
|--------------|--------------------------------------|
| categoryID | INT AUTO_INCREMENT PRIMARY KEY |
| name | VARCHAR(50) NOT NULL |
| noOfProducts | BIGINT NOT NULL DEFAULT 0 |

4. Product –

Schema: **productID**, name, price, stock, brand, qty_bought, description, categoryID (fk)

| | |
|---|---|
| productID | INT AUTO_INCREMENT PRIMARY KEY |
| name | VARCHAR(50) NOT NULL |
| price | DECIMAL (10,2) NOT NULL |
| stock | INT NOT NULL DEFAULT 0 CHECK (stock>=0) |
| brand | VARCHAR(50) NOT NULL |
| qty_bought | INT NOT NULL DEFAULT 0 |
| description | VARCHAR(200) NOT NULL DEFAULT "A high-quality product." |
| categoryID (Product "Falls Under" ProductCategory relation) | INT NOT NULL FOREIGN KEY references productCategory(categoryID) ON DELETE CASCADE ON UPDATE CASCADE |

5. DeliveryAgent –

Schema: **agentID**, name (first_name, last_name), availabilityStatus, phone_no, email, password

| | |
|--------------------|--|
| agentID | INT AUTO_INCREMENT PRIMARY KEY |
| first_name | VARCHAR(50) NOT NULL |
| last_name | VARCHAR(50) |
| availabilityStatus | VARCHAR(20) NOT NULL DEFAULT "Offline" |
| phone_no | BIGINT UNIQUE NOT NULL |
| email | VARCHAR(100) UNIQUE NOT NULL |
| password | VARCHAR(50) NOT NULL |

6. Store

Schema: **storeID**, address (street, city, state, pin)

| | |
|---------|--------------------------------------|
| storeID | INT AUTO_INCREMENT PRIMARY KEY |
| street | VARCHAR(100) NOT NULL |
| city | VARCHAR(50) NOT NULL |
| state | VARCHAR(50) NOT NULL |
| pincode | INT NOT NULL |

7. Order

Schema: orderID, status, total_price, time, location, customerID (fk), agentID (fk)

| | |
|---|--|
| orderID | INT AUTO_INCREMENT PRIMARY KEY |
| status | VARCHAR(20) NOT NULL DEFAULT "Confirmed" |
| total_price | DECIMAL (10,2) NOT NULL |
| time | TIMESTAMP NOT NULL DEFAULT CURRENT_TIMESTAMP |
| location | VARCHAR(255) NOT NULL |
| customerID (Customer "places" Order relation) | INT NOT NULL FOREIGN KEY references customer(customerID) |
| agentID (Order "fulfilled by" DeliveryAgent relation) | INT NOT NULL FOREIGN KEY references deliveryAgent(agentID) |

Weak Entities :-

1. Wallet

Schema: customerID (discriminator/partial key), balance, upiID, rewardPoints

| | |
|---|---|
| customerID (Wallet "Belongs to" Customer identifying relation) | INT NOT NULL FOREIGN KEY references customer(customerID) ON DELETE CASCADE |
| balance | DECIMAL(10, 2) NOT NULL DEFAULT 0 CHECK (balance >= 0) |
| upiID | VARCHAR(100) NOT NULL |
| rewardPoints | INT NOT NULL DEFAULT 0 |

2. Delivery_agent_wallet

Schema: agentID (discriminator/partial key), earning_balance, earning_paid, earning_total, Transaction_history, upiID

| | |
|--|---|
| agentID (Agent_Wallet “Belongs to” Agent identifying relation) | INT NOT NULL FOREIGN KEY references deliveryAgent(agentID) ON DELETE CASCADE |
| earning_balance | DECIMAL(10, 2) NOT NULL DEFAULT 0 CHECK (earning_balance>=0) |
| earning_paid | DECIMAL(10, 2) NOT NULL DEFAULT 0 CHECK (earning_paid>=0) |
| earning_total | DECIMAL(10, 2) NOT NULL DEFAULT 0 |
| Transaction_history | VARCHAR(500) |
| upiID | VARCHAR(100) NOT NULL |

3. ProductReview

Schema: productReviewID (discriminator/partial key), orderID, customerID, comment, rating

| | |
|--|---|
| productReviewID | INT NOT NULL |
| orderID (Customer “purchases” Product Ternary relation) | INT NOT NULL FOREIGN KEY references order(orderID) ON DELETE CASCADE |
| customerID (Customer “purchases” Product Ternary relation) | INT NOT NULL FOREIGN KEY references customer(customerID) ON DELETE CASCADE |
| comment | TEXT |
| rating | INT DEFAULT 5 CHECK (rating >= 1 AND rating <= 5) |

4. DeliveryReview

Schema: deliveryReviewID (discriminator/partial key), orderID, agentID, comment, rating, tip

| | |
|---|---|
| deliveryReviewID | INT NOT NULL |
| orderID | INT NOT NULL FOREIGN KEY references order(orderID) ON DELETE CASCADE |
| agentID (Customer "rates" Delivery Ternary relation) | INT NOT NULL FOREIGN KEY references deliveryAgent(agentID) ON DELETE CASCADE |
| comment | TEXT |
| rating | INT DEFAULT 5 CHECK (rating >= 1 AND rating <= 5) |
| tip | DECIMAL(10, 2) DEFAULT 0 |

Relations Schema :-

1. AddsToCart - Customer Adds to Cart Product

Schema: customerID, productID, quantity

| | |
|------------|--|
| customerID | INT NOT NULL PRIMARY KEY FOREIGN KEY references customer(customerID) ON DELETE CASCADE |
| productID | INT NOT NULL PRIMARY KEY FOREIGN KEY references product(productID) ON DELETE CASCADE |
| quantity | INT NOT NULL DEFAULT 1 CHECK (quantity >= 1) |

2. OrderConsistsProduct - Order Consists Of Product

Schema: orderID, productID, quantity

| | |
|-----------|--|
| orderID | INT NOT NULL PRIMARY KEY FOREIGN KEY references order(orderID) ON DELETE CASCADE |
| productID | INT NOT NULL PRIMARY KEY FOREIGN KEY references product(productID) ON DELETE CASCADE |
| quantity | INT NOT NULL DEFAULT 1 CHECK (quantity >= 1) |

3. StoreContainsProduct - Store contains Products

Schema: storeID, productID, quantity

| | |
|-----------|--|
| storeID | INT NOT NULL PRIMARY KEY FOREIGN KEY references store(storeID) ON DELETE CASCADE |
| productID | INT NOT NULL PRIMARY KEY FOREIGN KEY references product(productID) ON DELETE CASCADE |
| quantity | INT NOT NULL DEFAULT 1 CHECK (quantity >= 1) |