**POS System Specifications Document**

**1. System Overview**

A lightweight Point of Sale (POS) system designed for retail operations with automatic database persistence.  
Core functionalities include:

* Product and inventory management
* Sales transaction processing
* Invoice generation
* Revenue tracking
* Secure user authentication (bcrypt password encryption)

**2. Core Entities**

**2.1 Product Entity**

Represents sellable items in inventory.

**2.2 Invoice Entity**

Records completed sales transactions.

**2.3 User Entity**

System operators with authentication and role-based access.

**2.4 Inventory Entity**

Tracks product quantities and reorder thresholds.

**Entity Attributes.3**

**Product Schema3.1**

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Constraints | Data Type | Field |
| Auto-incremented product identifier | PRIMARY KEY | INT | id |
| Product display name | NOT NULL | VARCHAR(100) | name |
| Product classification | NOT NULL | VARCHAR(50) | category |
| Retail price per unit | NOT NULL | DECIMAL(10,2) | Unit price |
| Whosesale purchase price | NOT NULL | DECIMAL(10,2) | Purchase price |
| Available stock quantity | INT | NOT NULL | quantity |

**Invoice Schema 3.2**

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Constraints | Data Type | Field |
| Unique transaction ID | PRIMARY KEY | INT | Invoice number |
| Transaction timestamp | NOT NULL | DATETIME | Created at |
| Final payable amount | NOT NULL | DECIMAL(10,2) | Total amount |

**3.3 User Schema**

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Constraints | Data Type | Field |
| Staff identifier | PRIMARY KEY | INT | User id |
| Login credential | UNIQUE | VARCHAR(50) | username |
| Secure password encoding | NOT NULL | VARCHAR(255) | Password hash |
| Access level | ('ADMIN','CASHIER') | ENUM | role |

**3.4 Inventory Schema**

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **Constraints** | **Data Type** | **Field** |
| Auto-incremented inventory ID | INT | PRIMARY KEY | Inventory id |
| Linked product ID | INT | FOREIGN KEY → Product(id) | Product id |
| Low stock threshold | INT | DEFAULT 2 | Reorder level |

**3.5 Sales Schema**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Description** | **Constraints** | **Data Type** | | **Field** | |
| Auto-incremented sale record ID | INT | PRIMARY KEY | | Sale id | |
| Related invoice number | INT | FOREIGN KEY → Product(id) | | Invoice id | |
| |  | | --- | | Related product ID |  |  | | --- | |  | | INT | FOREIGN KEY → Product(id) | | Product id | |
| |  | | --- | | Quantity of product sold |  |  | | --- | |  | | INT | | NOT NULL | | |  | | --- | | Quantity sold |  |  | | --- | |  | |
| Total sale value for that product | |  | | --- | | DECIMAL(10,2) |  |  | | --- | |  | | | |  | | --- | | NOT NULL |  |  | | --- | |  | | | Total price |

|  | | |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | |  |  |  |
|  |  |

**4. Business Processes**

**4.1 Inventory Management**

* **Add product**: Insert a new product record.
* **Update stock**: Adjust inventory levels.
* **Get low stock**: Return items below their reorder threshold.

**4.2 Sales Operations**

* **Create invoice**: Initialize a new transaction.
* **Add line item**: Associate products with an invoice.
* **Process payment**: Finalize a sale.

**4.3 Reporting**

* **Generate daily sales**: Aggregate sales by date.
* **Inventory status**: Display current stock levels.