Inventory Management System (Java + MySQL CLI)

Authors: Rohan, Shivam Kumar, Sachin

Date: January 2026

1. Abstract

This project presents a Command-Line Interface (CLI) based Inventory Management System developed using Java and MySQL. The system enables users to manage inventory items, categories, and user roles efficiently. It supports user registration, authentication, and role-based access control for administrators, storekeepers, and customers.

2. Introduction

Managing inventory manually can lead to errors, inefficiencies, and data loss. This project addresses these issues by providing a CLI-based inventory system that allows users to perform CRUD operations on items and categories, while enforcing role-based access.

Objectives:

- Develop a CLI-based inventory system using Java and MySQL.

- Implement user authentication and registration.

- Provide role-based access for admin, storekeeper, and customer.

- Enable item and category management.

3. System Design

Architecture:

- Java CLI application using JDBC to connect to MySQL database.

- DAO pattern for database operations.

- Role-based access control.

Database Schema:

1. users (user_id, username, password, role)

2. categories (category_id, name)

3. items (item_id, item_code, item_name, category_id, unit, sku, user_id, purchase_price, sale_price, quantity, gst, expiry_date)

Roles:

- Admin: Full access to all features.

- Storekeeper: Can manage items and categories.

- Customer: Can view items only.

4. Implementation

CLI Menus:

- Login/Register screen.

- Role-based menus for Admin, Storekeeper, Customer.

DAO Classes:

- UserDAO: Handles user registration, login, and role checks.

- ItemDAO: Manages item CRUD operations.

- CategoryDAO: Manages category CRUD operations.

Authentication Flow:

- User enters username and password.

- System verifies credentials and loads appropriate menu.

Role-Based Restrictions:

- Admin: Add/edit/delete users, items, categories.

- Storekeeper: Add/edit/delete items and categories.

- Customer: View items only.

5. Results

Sample CLI Output:

=== Welcome to Inventory System ===

1. Register

2. Login

Choose option: 1

Enter username: rohan

Enter password: ****

Select role (admin/storekeeper/customer): admin

Registration successful!

Sample SQL Insert:

INSERT INTO users (username, password, role) VALUES ('rohan', 'hashedpass', 'admin');

INSERT INTO categories (name) VALUES ('Groceries');

INSERT INTO items (item_code, item_name, category_id, unit, sku, user_id, purchase_price, sale_price, quantity, gst, expiry_date)

VALUES ('ITM001', 'Rice', 1, 'kg', 'RICE001', 1, 40.0, 50.0, 100, 5.0, '2026-12-31');

6. Conclusion

This project successfully demonstrates a CLI-based inventory management system with role-based access. It allows efficient management of users, items, and categories.

Achievements:

- Functional CLI with authentication and role-based menus.

- JDBC integration with MySQL.

- Modular DAO structure.

Limitations:

- No GUI interface.

- No reporting or analytics.

Future Improvements:

- Add GUI using JavaFX or Swing.

- Develop a web-based version using Spring Boot.

- Add inventory alerts and reporting features.

7. References

- Java Documentation: https://docs.oracle.com/javase/

- JDBC Guide: https://docs.oracle.com/javase/tutorial/jdbc/

- MySQL Documentation: https://dev.mysql.com/doc/

- FPDF for Python: https://pyfpdf.github.io/