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**Cyprus International University**

**SOFTWARE QUALITY ASSURANCE AND TESTING**

**2024-2025 Spring Term Project**

**Inventory Management System**

**Prepared By;**

**22205643 Khaled Mughirah**

**22205611 Awab Al sadun**

**22206199 Yousef Altaher**

**Submitted to;**

**Instr. SHAHRZAD**

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### 1. Introduction

The Inventory Management System is a **Java terminal-based application** developed with an SQLite database. It is designed to allow users to manage product inventories directly from the command line. The system facilitates operations like adding, searching, updating, and deleting product records, helping users maintain a structured inventory through simple terminal interactions.

### 2. Objectives

* To simplify and automate the process of inventory tracking using a terminal interface.
* To provide essential inventory functions such as search, sort, and data export.
* To maintain an accurate, up-to-date list of products and stock levels.
* To help users make better decisions through calculated insights such as total value and low-stock alerts.

### 3. System Features

The application supports the following key functionalities:

1. **Add Product** – Insert a new product with name, price, and quantity into the inventory.
2. **View Products** – Display all product records stored in the inventory.
3. **View Products by Price Range** – Filter and list products within a user-defined price range.
4. **Update Product** – Modify details of an existing product.
5. **Delete Product** – Remove a product from the inventory.
6. **Search Product by Name** – Find a specific product by entering its full or partial name.
7. **View Low Stock Products** – List products whose quantity falls below a set threshold.
8. **Calculate Total Inventory Value** – Compute the cumulative value of all products based on their price and quantity.
9. **Sort Products by Price** – Arrange products in ascending or descending order based on price.
10. **Export Products to CSV** – Save the inventory data into a CSV file for external use or backup.

### 4. Tools and Technologies Used

* **Programming Language**: Java
* **Database**: SQLite
* **Development Environment**: IntelliJ IDEA
* **Database Access**: JDBC (Java Database Connectivity)
* **Operating Mode**: Terminal (Command Line Interface)
* **File Export Format**: CSV

### 5. Functional Overview

Each function is implemented as a separate method in Java, interacting with the SQLite database through SQL queries executed via JDBC. Input is handled via the terminal using standard Java input mechanisms, and the application prints outputs and menus directly to the screen.

Despite being a terminal-based system, the application offers a complete suite of inventory tools that are reliable and efficient. It ensures clean separation between user input, processing logic, and data storage, making the system easy to maintain and extend.

### 6. Data Flow and Control Flow Diagrams

This project is supported by two diagrams submitted in separate Word files:

* **Data Flow Diagram (DFD)** – Visualizes how data travels between the user, application functions, and the database.
* **Control Flow Diagram (CFD)** – Illustrates the sequence of operations and logical paths a user can follow through the application’s interface.

These diagrams are crucial in understanding the internal workflow and overall structure of the system.

### 7. Conclusion

The Inventory Management System achieves its goal of offering an efficient, reliable, and user-friendly solution for product tracking through a terminal interface. It supports all core inventory operations and offers helpful extras like sorting, filtering, and CSV export. Built with simplicity and practicality in mind, this project demonstrates effective use of Java and SQLite for real-world problem-solving.