**Assignment: Python Programming for DL**

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**Problem 2: : Inventory Management System Optimization**

**Scenario:**

You have been hired by a retail company to optimize their inventory management system. The company wants to minimize stockouts and overstock situations while maximizing inventory turnover and profitability.

**Tasks:**

1. **Model the inventory system**: Define the structure of the inventory system, including products, warehouses, and current stock levels.

2. **Implement an inventory tracking application**: Develop a Python application that tracks inventory levels in real-time and alerts when stock levels fall below a certain threshold.

3. **Optimize inventory ordering**: Implement algorithms to calculate optimal reorder points and quantities based on historical sales data, lead times, and demand forecasts.

4. **Generate reports**: Provide reports on inventory turnover rates, stockout occurrences, and cost implications of overstock situations.

5. **User interaction**: Allow users to input product IDs or names to view current stock levels, reorder recommendations, and historical data.

**Deliverables:**

* **Data Flow Diagram**: Illustrate how data flows within the inventory management system, from input (e.g., sales data, inventory adjustments) to output (e.g., reorder alerts, reports).
* **Pseudocode and Implementation**: Provide pseudocode and actual code demonstrating how inventory levels are tracked, reorder points are calculated, and reports are generated.
* **Documentation**: Explain the algorithms used for reorder optimization, how historical data influences decisions, and any assumptions made (e.g., constant lead times).
* **User Interface**: Develop a user-friendly interface for accessing inventory information, viewing reports, and receiving alerts.
* **Assumptions and Improvements**: Discuss assumptions about demand patterns, supplier reliability, and potential improvements for the inventory management system's efficiency and accuracy.

Solution:

# Real-Time Weather Monitoring System

# 1.Data Flow Diagram

**Creating a inventory system**

**Ask the user to choose option**

**Ask the user to for amount in stock**

**Ask user to continue order or exit**

# 2. Implementation

|  |
| --- |
|  |

# 3.Display the Current weather information

Choose Any One of The Following :-

1)Admin

2)User

3)Exit

Enter Your Choice Here :-

2

======= Welcome to the User Inventory Management System ====

1)Display All Products With Details

2)Display Specific Product With Details

3)Display All Purchase Bills

4)Buy The Product

5)Exit

Enter Your Choice :-

4

Enter Your User ID if You are Old Customer else press '0' To New User ID :-

0

Enter Number of Products You Want To Buy :-

2

Enter Data As Follows :-

Enter Product ID of Product 1 that you want to buy

1002

For Product lotion Available Quantity is :- 100

Enter Quantity of Product 1 that you want to buy

1

Enter Product ID of Product 2 that you want to buy

1002

For Product lotion Available Quantity is :- 99.0

Enter Quantity of Product 2 that you want to buy

2

========= Bill ========

#######################

User ID :- 1000

#################

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Purchase number 1

Purchase Time :- Wed Jul 17 15:33:31 2024

Product ID :- 1002

Name Of Product :- lotion

Category Of Product :- beauty & personal

Price of Product per Item :- 250

Purchase Quantity :- 1

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Purchase number 2

Purchase Time :- Wed Jul 17 15:33:47 2024

Product ID :- 1002

Name Of Product :- lotion

Category Of Product :- beauty & personal

Price of Product per Item :- 250

Purchase Quantity :- 2

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\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Total Payable Bill :- 750.0 Transaction ID :- XBKHA864B2

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1)Display All Products With Details

2)Display Specific Product With Details

3)Display All Purchase Bills

4)Buy The Product

5)Exit

Enter Your Choice :-

5

**5.Documentation**

#### Inventory Management System Documentation

#### Table of Contents

#### [Introduction](https://chatgpt.com/#introduction)

#### [Features](https://chatgpt.com/#features)

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### Introduction

The Inventory Management System is designed to help businesses manage their inventory effectively. It allows users to track inventory levels, manage stock, and generate reports

**Features**

#### Add, update, and delete inventory items

#### Track inventory levels

#### Generate inventory reports

#### User authentication

#### Search functionality

### Installation

* **Clone the repository.**
* **Create a virtual environment and activate it.**
* **Install the required dependencies.**
* **Set up the database.**
* **Run the application**

**Usage**

* **Starting the Application:** After running **python app.py**, the application will start, and you can access it through your web browser at **http://localhost:5000**.
* **User Authentication:**
  + Register a new user or log in with existing credentials.
  + Only authenticated users can manage the inventory.
* **Managing Inventory:**
  + **Add Item:** Navigate to the "Add Item" page to add new inventory items.
  + **Update Item:** Edit item details from the inventory list.
  + **Delete Item:** Remove items from the inventory.
  + **View Inventory:** View all inventory items, including their details and current stock levels.
* **Generating Reports:**
  + Navigate to the "Reports" section to generate and view inventory reports.

**Conclusion**

* This Inventory Management System provides a simple yet effective way to manage and track inventory. It can be extended with additional features like advanced reporting, barcode scanning, and integration with other business systems.