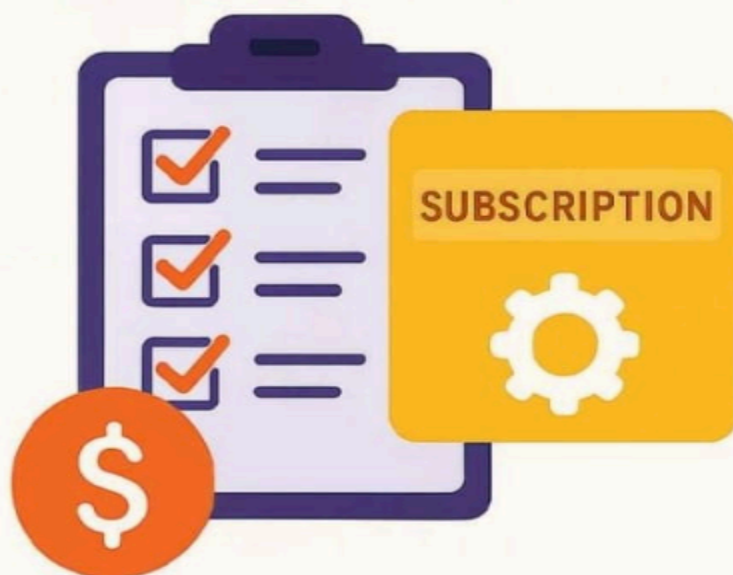




VIT BHOPAL

SUBSCRIPTION MANAGER



vityarthi

YOUR LEARNING DESTINATION

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INTRODUCTION:

Hotel Management Inventory Database System

Overview:

This project is a comprehensive Inventory Management System designed specifically for the hospitality industry. It replaces manual logbooks with a robust SQL-based database to track assets, manage suppliers, and monitor stock levels in real-time. This solution addresses the issues of revenue leakage and operational inefficiencies caused by traditional paper-based tracking.

Technologies Used:

- **Language: Python (for application logic)**
- **Database: SQL (MySQL / SQLite)**
- **Tools: VS Code, Git, Mermaid.js (for documentation)**

Steps to Install & Run:

Clone the repository:

git clone:

<https://github.com/pratul-kashyap1234/Hotel-Management-Inventory-Database-System>

Install dependencies:(Ensure you have Python installed)

pip install -r requirements.txt

Initialize the database: Run the SQL script to create the tables and relationships.

If using SQLite via a setup script

python setup_database.py

OR import 'database_schema.sql' into your MySQL Workbench

Run the application:

python main.py

Instructions for Testing:

Test Add Item:

- Navigate to the "Add Item" menu.
- Input a new product (e.g., "Liquid Soap 5L") with a quantity of 10.
- Verify it appears in the "View All Inventory" list.

Test Transaction (Stock Out):

- Select "Issue Stock".
- Choose the item "Liquid Soap 5L" and issue 2 units to "Housekeeping".
- Check the "View All Inventory" list again; the quantity should now be 8.

Test Low Stock Alert:

- Manually issue enough stock so the remaining quantity falls below the reorder level (e.g., below 5).
- Navigate to "Reports" -> "Low Stock"; the item should appear there.

Functional Requirements:

- **Product Management:** Create, Read, Update, and Delete (CRUD) inventory items with categorization.
- **Stock Tracking:** Real-time updates of stock levels via "Check-in" (Purchase) and "Check-out" (Issue) transactions.
- **Reporting:** Automatic detection of items below reorder levels (Low Stock Alerts).
- **Department Allocation:** Track which department (Kitchen, Laundry, etc.) is consuming the most resources.
- **Role-Based Access:** Security separation between Admin (full access) and General Staff (transaction access only).

Non-Functional Requirements:

- **Portability:** The system runs as a single Python script with no external dependencies or database installations required.
- **Performance:** Since data is stored in RAM (In-Memory), retrieval and updates are instantaneous (microsecond latency).
- **Usability:** The Command Line Interface (CLI) prompts are designed to be intuitive, guiding the user step-by-step.
- **Robustness:** The system handles basic logic errors, such as preventing users from consuming non-existent stock.

Problem Statement:

Hotels manage thousands of consumable items daily, from toiletries and linens to food ingredients. Manual tracking of this inventory using paper logs or disconnected spreadsheets leads to operational inefficiencies, including:

1. **Revenue Leakage:** Due to unrecorded consumption or theft.
2. **Operational Delays:** Running out of critical stock (e.g., soap, fresh towels) negatively impacts guest experience.
3. **Data Silos:** Purchasing teams do not know what the Housekeeping team actually needs in real-time.

Scope of the Project:

The scope of this project is limited to the internal inventory control of a single hotel property. It covers the lifecycle of a product from purchase (entry) to issuance (exit). It does not cover room booking or guest management.

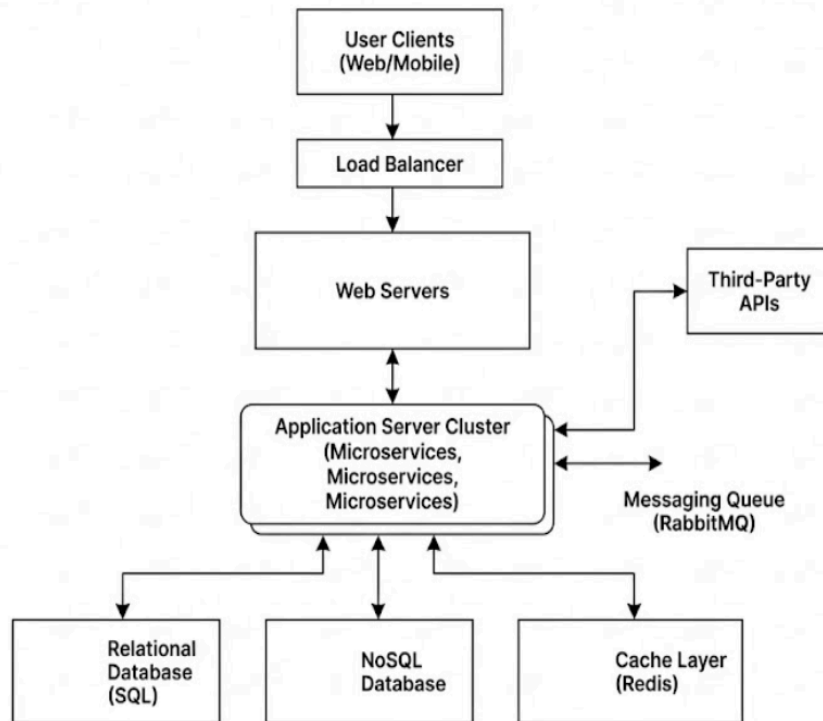
Target Users:

- **Hotel Store Manager:** Responsible for purchasing and maintaining stock levels.
- **Department Heads:** (e.g., Head Chef, Housekeeping Supervisor) who request items from the store.
- **Hotel Administrator:** Who oversees the overall efficiency and costs.

High-Level Features:

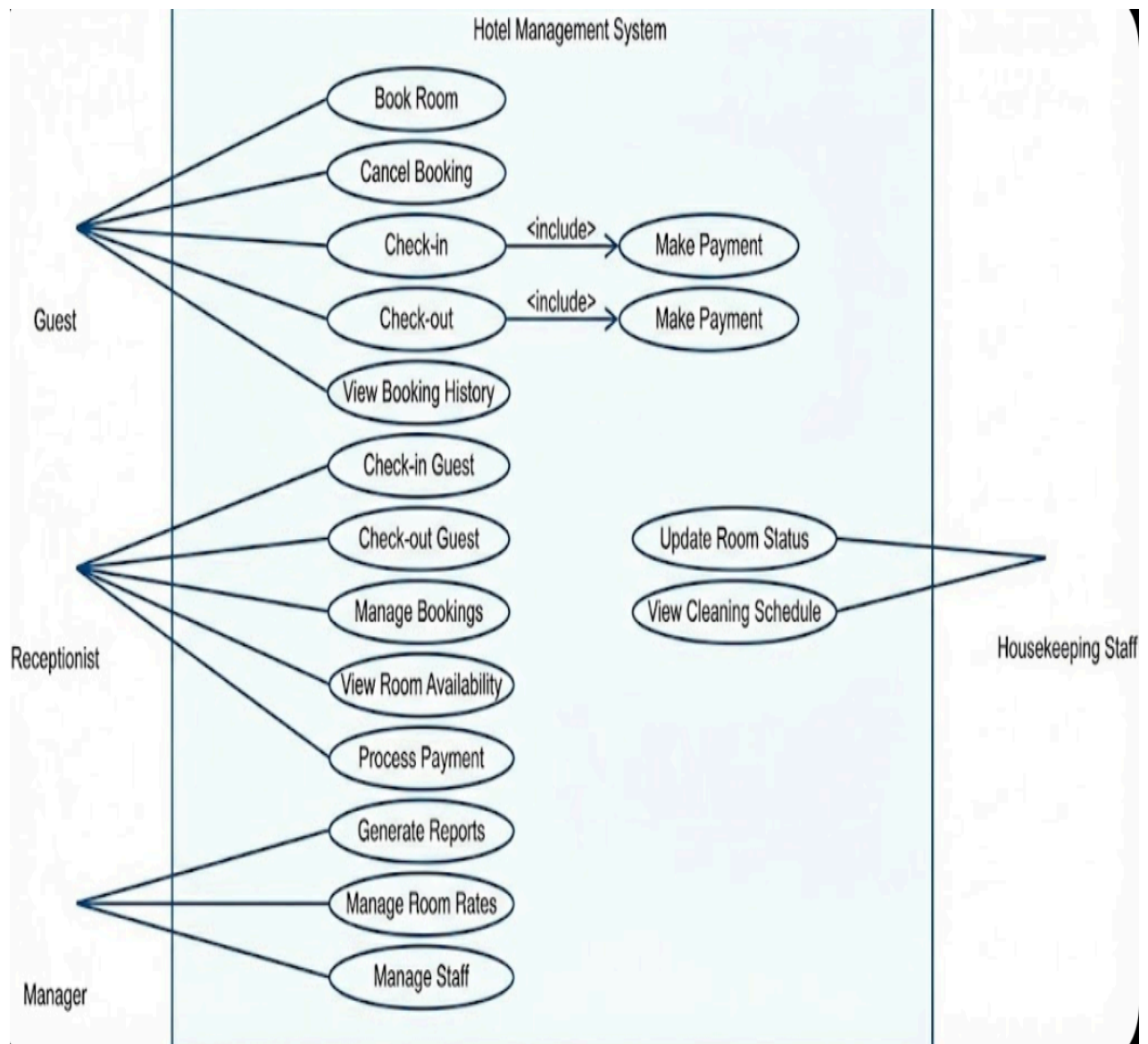
- **Centralized Database:** A single source of truth for all hotel assets.
- **Transaction Logging:** Immutable history of every item moved in or out.
- **Supplier Management:** Linking items to specific vendors for easier reordering.
- **Alert System:** Proactive notifications for low inventory.

SYSTEM ARCHITECTURE:

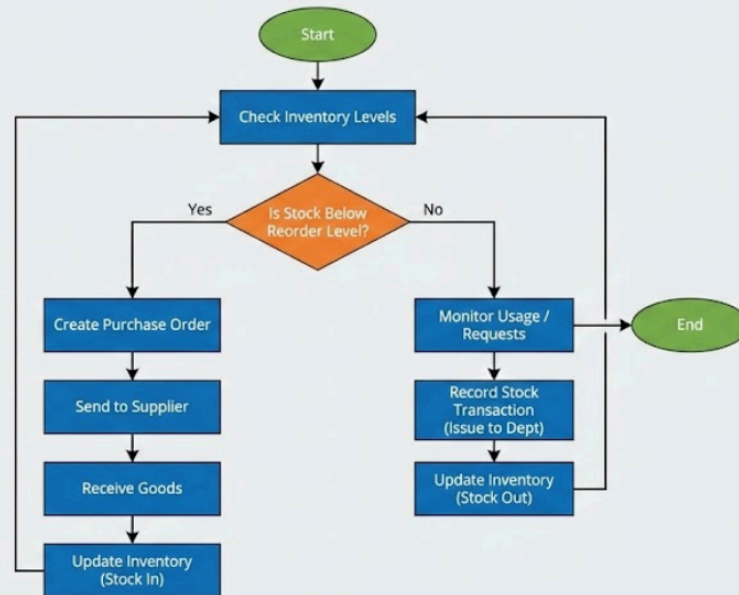


DESIGN DIAGRAMS:

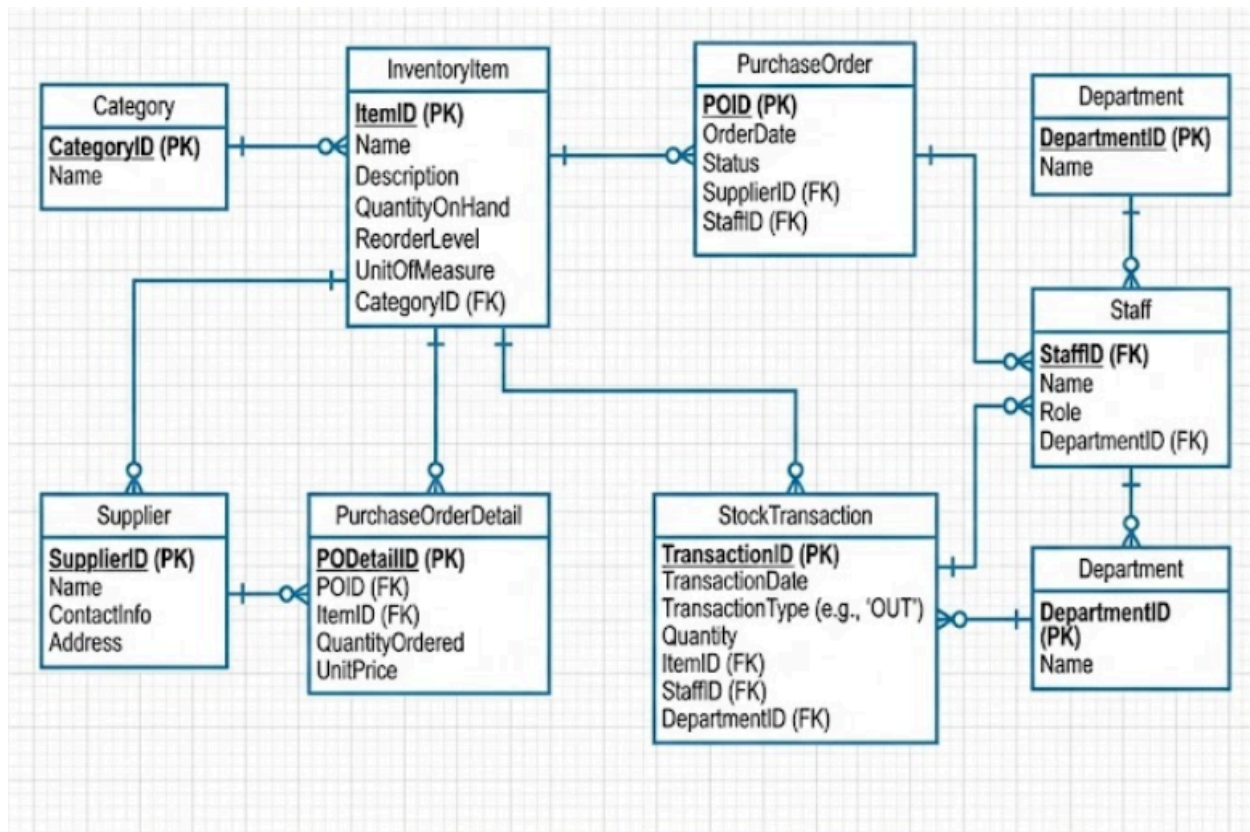
USE CASE DIAGRAM:



Hotel Inventory Management Process Flow



ER.DIAGRAM:



Implementation Details:

The core logic relies on list manipulation.

- Adding Items: `products.append(new_dictionary)` adds a new record.
- Updating Stock: The system iterates through the `products` list to find the matching `id`. Once found, it directly modifies the `stock` key.

Code Snippet: Stock Logic

```
if action == 'IN':  
    selected_product["stock"] += qty  
elif action == 'OUT':  
    if selected_product["stock"] >= qty:  
        selected_product["stock"] -= qty
```

Implementation Details (Data Structures)

- **Products List:** Stores the main inventory.

```
products = [  
    {"id": 1, "name": "Soap", "stock": 50, ...},  
    {"id": 2, "name": "Towel", "stock": 20, ...}  
]
```

- **Categories List:** Hardcoded categories to simplify data entry.

```
categories = [  
  
    {"id": 1, "name": "Housekeeping"},  
    {"id": 2, "name": "Kitchen"}  
  
]
```

SCREENSHOTS:

```
=== HOTEL INVENTORY SYSTEM (In-Memory) ===  
1. Add New Item  
2. View Inventory  
3. Update Stock (In/Out)  
4. Exit
```

```
=== HOTEL INVENTORY SYSTEM (In-Memory) ===  
1. Add New Item  
2. View Inventory  
3. Update Stock (In/Out)  
4. Exit  
Select an option (1-4): 1  
  
--- ADD NEW PRODUCT ---  
Enter Product Name (e.g., Soap): nirma  
  
Select Category:  
1. Housekeeping  
2. Kitchen  
3. Maintenance  
Enter Category ID: 2  
Enter Unit Price: 2.4  
Enter Reorder Level (default 5): 5  
Success! 'nirma' added to inventory with ID 1.
```

```
=== HOTEL INVENTORY SYSTEM (In-Memory) ===  
1. Add New Item  
2. View Inventory  
3. Update Stock (In/Out)  
4. Exit  
Select an option (1-4): 2  
  
--- CURRENT INVENTORY STATUS ---  
ID      Name      Stock      Price      Status  
-----  
1      nirma      0          $2.4      LOW STOCK!
```

=== HOTEL INVENTORY SYSTEM (In-Memory) ===

1. Add New Item
2. View Inventory
3. Update Stock (In/Out)
4. Exit

Select an option (1-4): 3

--- UPDATE STOCK ---

--- CURRENT INVENTORY STATUS ---

ID	Name	Stock	Price	Status
1	nirma	0	\$2.4	LOW STOCK!

Enter Product ID to update: 1

Type 'IN' to add stock (Purchase) or 'OUT' to issue stock: IN

Enter Quantity: 67

Stock updated successfully.

=== HOTEL INVENTORY SYSTEM (In-Memory) ===

1. Add New Item
2. View Inventory
3. Update Stock (In/Out)
4. Exit

Select an option (1-4): 2

--- CURRENT INVENTORY STATUS ---

ID	Name	Stock	Price	Status
1	nirma	67	\$2.4	OK

=== HOTEL INVENTORY SYSTEM (In-Memory) ===

1. Add New Item
2. View Inventory
3. Update Stock (In/Out)
4. Exit

Select an option (1-4): 4

Exiting system. Goodbye!

Testing Approach:

- **Functional Testing:**

- *Test:* Added "Soap" with 0 stock. Performed "Stock In" of 10.
- *Result:* View Inventory showed 10. Success.

- **Boundary Testing:**

- *Test:* Tried to "Stock Out" 15 units when only 10 were available.
- *Result:* System displayed "Insufficient stock" error message. Success.

- **Logic Verification:**

- *Test:* Verified that Reorder Level alerts appear exactly when stock matches or falls below the limit.

Challenges Faced:

- **Data Volatility:** Since we removed the database, all data is lost when the program closes. This was a trade-off for simplicity and ease of setup.

- **Input Handling:** Without `try/except` blocks, the program requires the user to be careful (e.g., ensuring they type numbers, not letters).
- **List Iteration:** Finding the correct item in a list required writing a manual loop, which taught me about list traversal.

Learnings & Key Takeaways:

- **Data Structures:** Gained a deep understanding of how to use Lists of Dictionaries to model real-world objects.
- **Logic Flow:** Learned how to structure a `while True` loop to create a continuous application experience.
- **State Management:** Understood how variables hold the "state" of the application during its runtime.

Future Enhancements:

- **File I/O:** Implement saving data to a `.txt` or `.csv` file so that inventory is remembered after closing the program.

- **Search Function:** Add a feature to search for products by Name, not just ID.
- **GUI:** Build a visual interface using **Tkinter** for better user experience.

References:

1. Python 3 Documentation (Data Structures).
2. "Automate the Boring Stuff with Python" - List/Dictionary manipulation.
3. Standard Hotel Inventory Procedures.