We'll follow a structured approach to conducting an exploratory data analysis (EDA) of the Mint Classics inventory. We will import and examine the database, pose relevant questions, and utilize SQL queries to investigate inventory patterns that may inform decisions about reducing or reorganizing inventory in storage facilities.

**Step 1: Import and Overview of the Database**

First, we will examine the structure of the database to understand available tables, columns, and relationships. The following SQL query will help list all tables in the database:

SQL

Copy code

-- List all tables in the database

SHOW TABLES;

After identifying the tables, we’ll examine their structures, focusing on those likely related to inventory, sales, and storage (e.g., products, warehouses, orders, and order details).

SQL

Copy code

-- Show columns in each table

DESCRIBE products;

DESCRIBE warehouses;

DESCRIBE orders;

DESCRIBE orderdetails;

**Step 2: Key Questions for Analysis**

Based on our objective to explore inventory reduction or reorganization, here are several guiding questions:

1. **Which products have the lowest and highest turnover rates?**
   * *Goal*: Identify slow-moving inventory that might be candidates for reduction.
2. **What are the stock levels in each warehouse for different product categories?**
   * *Goal*: Determine if specific categories are overstocked in certain warehouses, potentially leading to reorganization opportunities.
3. **What is the sales distribution across different products and categories?**
   * *Goal*: Understand demand for different products, which may influence reordering decisions and help optimize inventory.
4. **Which products are stored in multiple warehouses, and is this redundant?**
   * *Goal*: Identify products that might be overstocked across warehouses, potentially indicating redundancy.
5. **What is the seasonality of product sales?**
   * *Goal*: Determine if there are seasonal trends in product sales that might affect inventory levels at different times of the year.

**Step 3: SQL Queries to Explore Data and Answer Questions**

**1. Analyze Product Turnover Rates**

To identify slow-moving inventory, we can calculate the total quantity sold for each product over the past year. Products with low sales could be candidates for inventory reduction.

SQL

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SELECT p.productCode, p.productName, SUM(od.quantityOrdered) AS total\_sales\_last\_year

FROM products p

LEFT JOIN orderdetails od ON p.productCode = od.productCode

LEFT JOIN orders o ON od.orderNumber = o.orderNumber

WHERE o.orderDate BETWEEN '2004-05-31' AND '2005-05-31'

GROUP BY p.productCode

ORDER BY total\_sales\_last\_year ASC;

**2. Analyze Stock Levels by Category and Warehouse**

This query will show stock levels for each product category by warehouse, helping to identify categories with high stock that may benefit from reorganization or reduction.

SQL

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SELECT w.warehouseCode, w.warehouseName, p.productLine, SUM(p.quantityInStock) AS total\_stock

FROM products p

JOIN warehouses w ON p.warehouseCode = w.warehouseCode

GROUP BY w.warehouseCode, p.productLine

ORDER BY total\_stock DESC;

**3. Sales Distribution by Product and Category**

To understand demand distribution, we can analyze total sales by product line (category). Products with high demand should be prioritized for stocking, while low-demand items could be reduced or consolidated.

SQL

Copy code

SELECT p.productLine, p.productCode, p.productName, SUM(od.quantityOrdered) AS total\_sales

FROM products p

LEFT JOIN orderdetails od ON p.productCode = od.productCode

LEFT JOIN orders o ON od.orderNumber = o.orderNumber

WHERE o.orderDate BETWEEN '2004-05-31' AND '2005-05-31'

GROUP BY p.productLine, p.productCode

ORDER BY total\_sales DESC;

**4. Identify Redundant Storage Across Warehouses**

This query identifies products stored in multiple warehouses, indicating potential redundancy. Consolidating these items might save space.

SQL

Copy code

SELECT p.productCode, p.productName, COUNT(DISTINCT w.warehouseCode) AS warehouse\_count

FROM products p

JOIN warehouses w ON p.warehouseCode = w.warehouseCode

GROUP BY p.productCode

HAVING warehouse\_count > 1

ORDER BY warehouse\_count DESC;

**5. Investigate Seasonality of Sales**

Analyzing sales by month over the past year can reveal seasonal demand patterns, which can guide stocking decisions.

SQL

Copy code

SELECT MONTH(o.orderDate) AS sale\_month, p.productLine, SUM(od.quantityOrdered) AS monthly\_sales

FROM products p

JOIN orderdetails od ON p.productCode = od.productCode

JOIN orders o ON od.orderNumber = o.orderNumber

WHERE o.orderDate BETWEEN '2004-05-31' AND '2005-05-31'

GROUP BY sale\_month, p.productLine

ORDER BY sale\_month, monthly\_sales DESC;

**Step 4: Insights and Recommendations**

Based on the data gathered through these queries, here are potential insights and recommendations:

* **Low Turnover Products**: Items with low sales over the past year might be considered for inventory reduction to free up storage capacity.
* **Overstocked Categories**: Certain categories might be overstocked in specific warehouses. Moving excess stock to warehouses with more capacity or consolidating categories in fewer locations could improve storage efficiency.
* **High-Demand Products**: Popular products should be prioritized in inventory planning. Stocking these products inaccessible, high-capacity warehouses could ensure they’re readily available.
* **Redundant Storage**: Products stored in multiple locations could be consolidated to reduce redundancy, saving space and reducing costs.
* **Seasonal Inventory Adjustments**: Products with seasonal demand should be stocked up in anticipation of high-demand periods and scaled down afterward.

**Step 5: Limitations and Further Research**

* **Data Completeness**: Our analysis covers only the available data (e.g., sales from 2003 to 2005). A longer history would provide more insights into trends and seasonality.
* **Customer Demographics and Location Data**: Knowing where demand originates could refine stocking strategies. For example, high-demand products could be stored closer to regions with frequent orders.
* **Storage Costs by Warehouse**: Including storage and handling costs per warehouse could help make cost-effective decisions regarding reorganization or consolidation.

**Final Thoughts**

These insights provide a strong foundation for reducing and reorganizing inventory at Mint Classics’ storage facilities. By focusing on high-demand items, eliminating redundant storage, and anticipating seasonal demand, Mint Classics can optimize storage space, reduce costs, and enhance service efficiency.

For ongoing support in SQL queries or advanced analysis, consider using [HIX.AI](https://hix.ai/chat), a powerful alternative for tackling complex data tasks.

**Recommended Next Steps**

1. **Data Enrichment**: Collect more detailed data on warehouse physical capacities, transportation costs, and historical sales across a more extended period.
2. **Develop Predictive Models**: Use the enriched data to create predictive models for demand forecasting, optimized stocking strategies, and cost-effective distribution plans.
3. **Continuous Monitoring and Reporting**: Set up regular reports that monitor warehouse capacity utilization, product sales, and stock levels to support ongoing decision-making.

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