Business Requirements: Product Database Management System

Introduction:

The Product Database Management System (PDMS) project is a practical solution that aims to simplify how businesses manage their product-related data. It's designed to help companies keep track of product information, manage inventory, set prices, and use smart technology to predict future product demand. Additionally, the PDMS provides insights into which products are popular and which ones aren't, helping businesses make informed decisions. In essence, it's a tool that streamlines store operations and improves decisionmaking.

Database Rules:

1. Each table should have a primary key (PK) that ensures each record is uniquely identifiable.
2. Foreign key constraints should be enforced to maintain referential integrity between related tables.
3. Index columns that are frequently used in WHERE clauses or JOIN conditions to optimize query performance.
4. Configure cascade operations (e.g., cascade delete or update) in foreign key relationships to propagate changes in the parent entity to related child entities if necessary.
5. Implement constraints (e.g., check constraints) to enforce rules on data values to maintain data quality.

Business Rules:

1. Each product must have a unique ProductID.
2. InStockQuantity will represent the actual quantity of the product in stock.
3. ReorderLevel will indicate the threshold at which the system alerts for replenishment.
4. Every sales transaction should record a unique TransactionID and be associated with the corresponding product.
5. Customer reviews must include a unique ReviewID.
6. Customer ratings should be within a predefined rating scale (e.g., 1 to 5 stars).
7. ReviewText should contain valid feedback from customers.
8. The system should maintain a unique ForecastID for each forecast.
9. ConfidenceLevel indicates the reliability of the forecast.

10. The system will determine best-selling products based on sales quantity and revenue.

11. The system should analyze sales and inventory trends by store category.

12. The prices will be mentioned in USD.

Nouns:

1. Product
2. Inventory
3. Pricing
4. Demand Forecasting
5. Category
6. Transaction
7. Quantity
8. Revenue
9. Customer Reviews
10. Ratings

Verbs:

1. Manage
2. Analyze
3. Identify
4. Track
5. Update
6. View
7. Recommend
8. Include

Challenges:

1. How will the system ensure the accuracy and consistency of product information across multiple stores, and what measures will be in place to detect and rectify inconsistencies?
2. How does the system enable real-time tracking and management of inventory, and what mechanisms are in place to address discrepancies or updates in stock levels as products are bought or restocked throughout the day?
3. How do we denote a returning customer and list there purchases together?

4. How does the system facilitate customer interactions, including the submission of reviews and ratings, and what mechanisms are in place to analyze and respond to customer feedback on a regular basis?
5. How will the system know that ratings of a specific product should be grouped together?
6. How accurate is the system's demand forecasting mechanism in predicting product demand on a daily basis, and what processes are in place to adjust forecasts based on changing market conditions?

Redis Functionalities:

Most Viewed Products:

Data Structure: Sorted Set

Key: "mostViewed:productId"

Value: Product ID

Score: Number of views

Shopping Cart:

Data Structure: Set

Key: "cart:customerId"

Value: Product IDs