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Retails & Inventory Management Systems

Project Description:

The **Retail & Inventory Management System** is designed to streamline and optimize the operations of a retail business. This system manages the entire retail workflow, from inventory tracking and product management to customer orders and payments. It helps businesses efficiently handle their stock, monitor supplier relationships, manage customer data, and keep track of sales and payments. The system enables real-time updates to inventory levels, provides insights into sales trends, and supports seamless order processing from customers.

Project Objective:

The objective of this project is to design and implement a robust database system for a retail business. The database will capture essential business operations, including product management, supplier information, customer orders, inventory control, employee management, and payment processing. The database will allow the organization to track stock levels, process orders, manage suppliers and employees, and generate insights for decision-making.

Core Features:

1. **Product Management**:
    - Categorization of products
    - Pricing, stock levels, and product descriptions
    - Managing product suppliers
2. **Inventory Management**:
    - Track product stock levels across multiple warehouses
    - Manage inventory in real-time to prevent overstocking or stockouts
3. **Order Processing**:
    - Customer order creation and management
    - Maintaining order status (Pending, Shipped, Delivered, etc.)
    - Order details including items, quantity, price, and total amount
4. **Supplier Management**:
    - Maintain supplier details (name, contact information, address)
    - Link products to their respective suppliers for easy tracking
5. **Customer Management**:

   - Track customer details, including name, contact information, and registered address
   - Support order history and customer preferences
6. **Employee Management**:
   - Store employee details such as name, role, and contact information
   - Link employees to specific warehouses for tracking purposes
7. **Payment Processing**:
   - Record customer payments for orders
   - Track different payment methods (Credit Card, Debit Card, PayPal, Cash)
   - Payment status tracking
8. **Reporting and Analytics**:
   - Sales and order history reports
   - Inventory usage and stock alerts
   - Financial summaries, including payment details and revenue tracking

Key Tables in the Database:

1. **Categories**
2. **Products**
3. **Suppliers**
4. **Customers**
5. **Orders**
6. **OrderItems**
7. **Inventory**
8. **Warehouses**
9. **Employees**
10. **Payments**

Technologies & Tools:

- **Database**: SQL (Relational Database Management System SQL Server)
- **SQL**: For querying the database, including DDL, DML, and SELECT queries
- **Mockaroo**: For generating mock data to populate the tables during testing and simulation
- **Git & Github**: version Controlling system

Project Deliverables:

1. **Database Design**:
    - The database schema for the Retail & Inventory Management System.
    - Proper use of tables, columns, and relationships (Foreign Keys).
2. **Structured SQL Code**:
    - SQL queries for creating tables with data types and necessary constraints.
    - SQL queries for inserting data into the database using Mockaroo data.
3. **Data Manipulation**:
    - Queries for retrieving, updating, and deleting records.
    - Usage of **string functions**, **date functions**, **casting**, and **window functions** as part of querying tasks.
4. **Report Generation**:
    - SQL queries to generate reports such as sales by product, order history by customer, and inventory usage.
    - Aggregation and summary queries.
5. **Documentation**:
    - A report outlining the design, table structures, relationships, and any assumptions made during database development.
6. **Future Enhancements**:
    - Propose possible improvements or enhancements to the system (e.g., implementing triggers, stored procedures, or views).

Learning Outcomes for Students:

- **Database Design**: Understanding the key concepts of database structure, normalization, and relationships between entities.
- **SQL Skills**: Developing proficiency in writing SQL queries for creating, updating, and managing database records.
- **Advanced SQL**: Learning to use **window functions**, **string functions**, **date functions**, and **casting** in SQL queries.
- **Problem Solving**: Applying database theory to real-world business scenarios and solving problems with SQL-based solutions.

This **Retail & Inventory Management System** project will help students develop a deep understanding of database design and SQL concepts while working on a real-world scenario. Let me know if you'd like to add anything else!