

E-commerce Website Schema Question

You are tasked with designing and querying a MySQL database schema for an e-commerce website. The website supports the following functionality:

- Customers can create accounts and place orders.
- Products are categorized into multiple categories.
- Each product can belong to multiple categories, and each category can have multiple products (many-to-many relationship).
- Orders can include multiple products, and the quantity of each product in the order is tracked.
- Customers should be able to retrieve details about their orders and available products.

Part 1: Table Creation

1. Create tables for the following entities:
 - **Customers:** Store basic customer details like customer_id, name, email, and created_at.
 - **Products:** Store product details like product_id, name, price, and stock_quantity.
 - **Categories:** Store category details like category_id and name.
 - **Orders:** Store order details like order_id, customer_id (foreign key), order_date, and status.
 - **Order_Items:** Store details about the products in each order, including order_id, product_id, quantity, and total_price.
 - **Product_Categories:** A bridge table for the many-to-many relationship between products and categories, with product_id and category_id.

Part 2: Relationships

1. Define the following relationships:
 - A customer can place multiple orders, but an order belongs to one customer.
 - A product can belong to multiple categories, and a category can include multiple products.
 - An order can include multiple products, and a product can be part of multiple orders.

Part 3: Data Retrieval

Write SQL queries for the following scenarios:

1. List all customers who placed at least one order in the last 30 days.
2. Retrieve all products under a specific category (e.g., "Electronics").
3. Fetch the details of an order by its order_id, including the customer's name, products ordered, their quantities, and the total order amount.
4. Find the top 5 best-selling products based on quantity sold.
5. Display categories along with the total number of products in each category.
6. Show the total revenue generated by the store.
7. List all products that are out of stock.
8. Retrieve all orders placed by a specific customer along with their order details.

Bonus Question

Optimize the schema to handle scenarios where:

1. Products might go on sale, and discounts should be tracked at the product level.
2. Customers should be able to review and rate products. Add tables for reviews and ratings.