

E-commerce Vendor

Scenario

An e-commerce company wants to build a Multi-Vendor SaaS application where multiple vendors can register and sell their products to customers. Each vendor must provide details such as business name, contact person, email, phone number, business address, and the subscription plan they are using. A vendor can list many products on the platform.

Every product has information like product name, description, price, stock quantity, and status (active/inactive). A product must belong to a single vendor but can also fall under one or more categories. Each category has its own name and description, and a product may appear in multiple categories.

The application also allows customers to register with their name, email, phone number, and address. A customer can place multiple orders. Each order contains an order date, total amount, and order status. Since a single order may include products from different vendors, there is a need for an order item entity that keeps track of each product in an order along with the quantity, unit price, and subtotal.

For every order, the customer must make a payment. A payment has a unique ID, method (such as Card, Bkash, PayPal, or Cash on Delivery), amount, payment date, and payment status.

Finally, the system supports subscription plans for vendors. Each subscription plan has a plan name, price, duration, and features. A vendor can only subscribe to one plan at a time.

Questions

Part A: ERD & Database Design

1. Based on the given scenario, identify at least 7 entities and their attributes.
2. Draw the ERD diagram with correct relationships and cardinalities (1:1, 1:N, M:N).
3. Convert the ERD into Relational Schema (tables with PK, FK).

Part B: SQL DDL (Table Creation)

4. Write the SQL command to create a table for Vendor, including primary key and foreign key reference to SubscriptionPlan.
5. Write the SQL command to create the ProductCategory table, ensuring it properly handles the M:N relationship between Product and Category.

Part C: SQL DML (Insert/Update/Delete)

6. Insert a new vendor named "SmartTech Ltd.", with contact person Rahim Khan, email rahim@smarttech.com, phone 017XXXXXXX, address Dhaka, Bangladesh, under the Basic plan.
7. Insert a product called "Laptop" under the Electronics category, price 75,000, stock 10, status active, belonging to SmartTech Ltd.
8. Update the stock quantity of "Laptop" product to 15.
9. Delete a customer whose email is "oldcustomer@gmail.com".

Part D: SQL Queries (DQL)

10. Write a query to display all vendors along with their subscription plan name and price.
11. Find all products under the category "Electronics" with their name, price, and stock quantity.
12. List all orders placed by customer "Karim Uddin", showing order_id, date, total_amount, and status.
13. Show the payment details (method, amount, status) for order_id = 1.
14. Find the top 5 best-selling products based on total quantity sold.

Part E: Advanced SQL

15. Write a query to calculate the total sales amount per vendor.
16. Find the names of customers who have not placed any orders.
17. Show the total number of active products available in the platform.
18. Retrieve the details of vendors who are subscribed to the Enterprise plan.
19. Write a query to calculate the average order amount per customer.
20. Display the list of customers who purchased products from more than one vendor.

Submission Guidelines:

1. Create ERD in DrawSQL or Lucidchart or any ERD tool. → take screenshot or share link.
2. Save all SQL DDL/DML/Queries in a single .sql file. (Comment each query clearly using -- to explain its purpose.)
3. Zip the ERD screenshot/link + SQL file and submit.