SQL Project: E-Commerce Database Management and Analysis

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INTRODUCTION

This project involves creating a schema for a SQL relational database system, exploring various aspects of database management, from basic CRUD operations to advanced topics like joins, aggregation, indexing, and optimization. It includes designing, implementing, and querying a relational database for a fictional e-commerce platform. This involves creating tables, performing data manipulations, and extracting meaningful insights using SQL queries.

01.

CRUD OPERATIONS

CRUD OPERATION

```sql
CREATE TABLE customers (
    customer_id serial PRIMARY KEY,
    name VARCHAR(100) NOT NULL,
    email VARCHAR(100) UNIQUE,
    phone_number VARCHAR(15),
    address TEXT
);
```

```sql
CREATE TABLE products (
    product_id serial PRIMARY KEY,
    product_name VARCHAR(100) NOT NULL,
    category VARCHAR(30),
    price NUMERIC,
    stock_quantity INTEGER
);
```

```sql
CREATE TABLE orders (
    order_id serial PRIMARY KEY,
    customer_id INTEGER REFERENCES customers (customer_id) ON DELETE CASCADE
    order_date DATE,
    total_amount NUMERIC
);
```

```sql
CREATE TABLE order_items (
    order_item_id serial PRIMARY KEY,
    order_id INTEGER REFERENCES orders (order_id) ON DELETE CASCADE, -- Wh
    product_id INTEGER REFERENCES products (product_id) ON DELETE CASCADE,
    quantity INTEGER,
    price NUMERIC
);
```

CRUD OPERATION

```sql
-- Add a new customer to the database
INSERT INTO customers (name, email, phone_number, address)
VALUES ('Kathleen Mcdaniel', 'kathleen.mcdaniel@email.com', '104-806-3986', '733 Robert Harbors Apt. 675 Huberhaven, WI

-- Update the stock quantity of a product after a purchase
UPDATE products
SET stock_quantity = stock_quantity - 3
WHERE product_id = 5;

-- Delete an order from the database
DELETE FROM orders
WHERE order_id = 9;

-- Retrieve all orders for a specific customer
SELECT o.order_id,
       o.order_date,
       o.total_amount
FROM Orders o
JOIN Customers c ON o.customer_id = c.customer_id
WHERE c.name = 'Charles Jennings';
```

02.

REVENUE ANALYSIS

QUERY RESULTS
REVENUE ANALYSIS

The total revenue generated from ORDERS table is $8,580

The total revenue generated by each products where the product Laptop generated the highest revenue followed by smartphone

product_name	total_revenue
Laptop	14,400
Smartphone	7,200
Monitor	5,100
Tablet	4,800
Desk	3,500
Headphones	3,200
Desk Chair	2,400
Printer	2,000
Keyboard	1,000
Mouse	390

The total revenue generated and the sum of price and quantity from order items may not match, as this dataset contains randomly generated sample data.

03.

CUSTOMER INSIGHTS

QUERY RESULTS
CUSTOMER INSIGHTS

Diane Pugh is the customer with the highest total spending of $700, followed by Tami Peterson

Kathleen Mcdaniel is the only customer that hasn’t made any purchases

A-Z customer_name	123 total_spending
Diane Pugh	700
Tami Peterson	680
Benjamin Fischer	580
Chad Henry	560
Ryan Daniels	540

The total revenue generated and the sum of price and quantity from order items may not match, as this dataset contains randomly generated sample data.

04.

TREND ANALYSIS

QUERY RESULTS
PRODUCT TRENDS

Top 3 selling products are Laptop, Smartphone, and Monitor

No product is out of stock

A-Z product_name	123 total_revenue
Laptop	14,400
Smartphone	7,200
Monitor	5,100

The total revenue generated and the sum of price and quantity from order items may not match, as this dataset contains randomly generated sample data.

QUERY RESULTS
MONTHLY TRENDS

The query calculates the number of orders and total revenue for each month. November had the recorded the highest total revenue.

123 monthno	A-Z month	123 number_of_orders	123 total_revenue
1	January	1	150
2	February	2	420
3	March	3	920
4	April	2	570
5	May	2	690
6	June	2	440
7	July	3	1,070
8	August	3	650
9	September	2	520
10	October	3	1,150
11	November	3	1,190
12	December	3	810

The total revenue generated and the sum of price and quantity from order items may not match, as this dataset contains randomly generated sample data.

QUERY RESULTS
WINDOW FUNCTION ANALYTICS

The query results uses a CTE to find customers whose total spendings is greater than $500. Returns 6 customers that satisfies that condition

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The total revenue generated and the sum of price and quantity from order items may not match, as this dataset contains randomly generated sample data.

SUMMARY

The analysis reveals that the total revenue generated from the orders table amounts to $8,580. Among the products, the Laptop generated the highest revenue, followed by the Smartphone, while the top three selling products overall are Laptop, Smartphone, and Monitor. Diane Pugh stands out as the customer with the highest total spending at $700, closely followed by Tami Peterson, whereas Kathleen McDaniel remains the only customer without any purchases. Additionally, all products are sufficiently stocked, with none being out of stock. A monthly analysis indicates that November recorded the highest total revenue.

THANK YOU