E-commerce Platform

Database Purpose:
The e-commerce database's purpose is to empower sellers with efficient product, customer, and order management through intuitive data tools and comprehensive reporting, facilitating data-driven decision-making for business growth. Besides, enable customers to utilize it for managing orders and payments.

Business Problems Addressed:
- Enhance product, customer, inventory and order management for sellers, streamlining daily operations and reducing inefficiencies.
- Simplify the order management process, reducing errors and ensuring accurate and speedy order fulfillment including return processor or coupon discount.
- Provide intuitive data tools to manage each seller's own e-commerce shop's information efficiently.
- Facilitate the orders and payments between sellers and customers by utilizing accurate data.

Business Rules:
- Each seller may have zero or more products.
- Each seller may have zero or more payments.
- Each seller may have zero or more revenues.
- Each seller may have zero or more products.
- Each order contains a single kind of product.
- Each order contains a single coupon.
- Each order contains the total cost.
- Each payment is mapped to a revenue.
- Each return is mapped to a payment.
- Products could contain multiple orders, and vice versa.
- Products could contain multiple categories, and vice versa.
- Users could contain multiple addresses, and vice versa.

Design Requirements:
- Use Crow's Foot Notation.
- Specify the primary key fields.
- Use lines to show the relationships between tables.
- Specify tables on one or many sides by placing symbols at both ends of lines.

Design Decisions:

Entity Name	Why Entity Included	How Entity is Related to Other Entities
1. users	We need to use users to store login information and personal data. This entity is also the basis of the entire e-commerce system	There are two entities extended by users, one for sellers and one for customers, and we extract another address entity from the relatively complex address information
2. users_addresses	The intermediate entity	Connect the users and addresses. (many to many)
3. addresses	The address can provide the location where the customer's order will be sent, received and even returned	Only related to the entity of users_addresses
4. sellers	Sellers are critical to our e-commerce platform. They are aligned to products to ensure an accurate amount and price. And sellers' inventory is important to inventory control. Payments and coupons (discounts) to sellers need to be tracked to ensure the accountability of revenues	There are two main approaches for sellers related to other entities. One is product related entities. Another one is for the financial part involves payments, revenues and coupons
5. customers	Customers is also associated with the users table Customers table relates to the ordering and payment process of orders. And includes functionality to write reviews	Related to users for storing account information. Mainly linked to orders tables which represent the buyer. Customers could write zero or multiple reviews to products and also could have zero or multiple returns for their own orders
6. products	Products are an important form for the entire platform. It is related to inventory	There are two important intermediary tables related to products:

	management, products on sale, product ratings, and which seller manages the product	products_categories and orders_products which are generated by the normalization process due to many to many relationships
7. products_categories	The intermediate entity	Connect the products and categories. (many to many)
8. categories	It plays a central role in providing a user-friendly experience, enhancing search and navigation, and supporting the growth and flexibility of a platform	Connected to products through the products_categories table
9. reviews	It is a valuable component as it empowers customers to share their experiences and opinions, enhances trust, provides valuable product insights, and contributes to the overall success and credibility of online business	Linked to products to associate reviews with specific products. Each customer can write multiple reviews, it's a one-to-many relationship between the "customers" entity and the "reviews" entity. Each review is usually related to one specific product. This creates a many-to-one relationship between the "reviews" entity and the "products" entity
10. orders_products	The intermediate entity	Connect the orders and products. (many to many)
11. orders	It comprises a distinct order ID, the customer responsible for the order, whether a coupon was utilized, the total amount, and the date of the order placement	There are 4 entities related to orders: orders_products, coupons, payments, returns.
12. coupons	It is included to manage and track promotional discounts offered by sellers. It records vital	There are 2 entities related to coupons: sellers and orders.

	details like coupon ID, seller information, discount value, coupon code, and validity, enabling efficient discount management and usage tracking for sellers	Sellers entity has a one-to-many relationship with coupons. Orders entity has a one-to-one relationship with coupons
13. payments	It is crucial for tracking financial transactions. It contains payment id, order id, seller id, total amount, and updated date. This information facilitates the management and record-keeping of payments made for orders, ensuring transparency and accuracy in financial transaction	There are 4 entities related to payments: sellers, revenues, returns, and orders. Sellers entity has a one-to-many relationship with payments. Revenues has a one-to-many relationship with payments Returns entity has a many-to-one relationship with payments. Orders entity has a one-to-one relationship with payments
14. revenues	It is included to monitor a seller's income. It stores revenue id, seller id, total earnings, and creation date. This allows for precise financial tracking and reporting, aiding sellers in managing their income effectively	There are 2 entities related to revenues: sellers and payments. Sellers entity has a one-to-many relationship with revenues. Payments entity has a many-to-one relationship with revenues
15. returns	It is essential for handling product returns. It includes return id, order id, customer id, payment id, and creation date. This information helps track and manage return transactions, ensuring	There are 3 entities related to returns: payments, customers and orders. Payments entity have a one-to-many relationship with returns. Customers entity has a

	efficient customer service and accurate financial alignment	one-to-many relationship with returns. Orders entity has a one-to-many relationship with returns