Entity-Relationship Diagram (ERD) for Clothing E-Commerce

Entities

1. **Users**

   o Represents the customers and administrators interacting with the platform.

2. **Products**

   o Represents the items available for sale on the platform.

3. **Orders**

   o Tracks customer orders.

4. **Order Items**

   o Links orders and products, recording details such as quantity and size.

5. **Categories**

   o Groups products into distinct categories (e.g., sweaters, pants).

6. **Inventory**

   o Tracks stock levels for each product, categorized by size.

7. **Shipping Details**

   o Stores delivery information for each order.

8. **Payments**

   o Tracks payment details for orders.

Attributes

1. **Users**

   - UserID (Primary Key)
   - FullName
   - Email
   - Password (Encrypted)
   - Role (e.g., Customer, Admin)
   - PhoneNumber
   - DateCreated
   - LastLogin

2. **Products**

   - ProductID (Primary Key)
   - Name
   - Description
   - Price
   - CategoryID (Foreign Key)
   - ImageURL
   - SKU (Stock Keeping Unit)
   - DateAdded
   - ActiveStatus (e.g., Active, Discontinued)

Orders

- o OrderID (Primary Key)
- o UserID (Foreign Key)
- o OrderDate
- o TotalAmount
- o Status (e.g., Pending, Shipped, Delivered, Cancelled)
- o PaymentID (Foreign Key)
- o TrackingNumber

3. **Order Items**

- o OrderItemID (Primary Key)
- o OrderID (Foreign Key)
- o ProductID (Foreign Key)
- o Quantity
- o Size
- o UnitPrice
- o Subtotal

4. **Categories**

- o CategoryID (Primary Key)
- o CategoryName
- o Description
- o ParentCategoryID (Foreign Key for hierarchical categories, nullable)

5. **Inventory**
   - o InventoryID (Primary Key)
   - o ProductID (Foreign Key)
   - o Size (e.g., S, M, L)
   - o QuantityAvailable
   - o ReorderThreshold

6. **Shipping Details**
   - o ShippingID (Primary Key)
   - o OrderID (Foreign Key)
   - o RecipientName
   - o Address
   - o City
   - o State/Province
   - o Country
   - o PhoneNumber
   - o ShippingMethod

7. **Payments**
   - o PaymentID (Primary Key)
   - o OrderID (Foreign Key)
   - o PaymentMethod (e.g., Credit Card, PayPal, Bank Transfer)
   - o PaymentDate
   - o PaymentStatus (e.g., Successful, Failed, Pending)
   - o TransactionID

Relationships

1. **Users and Orders**: One-to-Many
   - A user can place multiple orders, but each order is associated with one user.
2. **Orders and Order Items**: One-to-Many
   - Each order can have multiple items, but each item belongs to one order.
3. **Products and Order Items**: Many-to-Many (resolved through Order Items)
   - A product can appear in multiple orders, and an order can include multiple products.
4. **Products and Categories**: One-to-Many
   - A product belongs to one category, but a category can include many products.
5. **Categories (Hierarchical)**: One-to-Many (optional)
   - A category can have subcategories, forming a hierarchy.
6. **Products and Inventory**: One-to-Many
   - A product can have multiple inventory entries for different sizes.
7. **Orders and Shipping Details**: One-to-One
   - Each order has one set of shipping details.
8. **Orders and Payments**: One-to-One
   - Each order is linked to one payment record.

ERD

Users
UserID (PK)
FullName
Email
Password
Role
PhoneNumber
DateCreated
LastLogin

places

Products
ProductID (PK)
Name
Description
Price
CategoryID (FK)
ImageURL
SKU
DateAdded
ActiveStatus

Orders
OrderID (PK)
UserID (FK)
OrderDate
TotalAmount
Status
PaymentID (FK)
TrackingNumber

tracked by   belongs to   includes   contains   has   paid with

Inventory
InventoryID (PK)
ProductID (FK)
Size
QuantityAvailable
ReorderThreshold

Categories
CategoryID (PK)
CategoryName
Description
ParentCategoryID (FK, nullable)

Order Items
OrderItemID (PK)
OrderID (FK)
ProductID (FK)
Quantity
Size
UnitPrice
Subtotal

Shipping Details
ShippingID (PK)
OrderID (FK)
RecipientName
Address
City
State/Province
PostalCode
Country
PhoneNumber
ShippingMethod
EstimatedDeliveryDate

Payments
PaymentID (PK)
OrderID (FK)
PaymentMethod
PaymentDate
PaymentStatus
TransactionID

sub-category of