

Electronic Gadget

TechShop, an electronic gadgets shop

Instructions:

- Submitting assignments should be a single file or through git hub link shared with trainer and hexavarsity.
- Each assignment builds upon the previous one, and by the end, you will have a comprehensive application implemented in Java/C#/Python with a strong focus on SQL schema design, control flow statements, loops, arrays, collections, and database interaction.
- Follow object-oriented principles throughout the Java programming assignments. Use classes and objects to model real-world entities, encapsulate data and behavior, and ensure code reusability.
- Throw user defined exception from method and handle in the main method.
- The following Directory structure is to be followed in the application.
 - **entity/model**
 - Create entity classes in this package. All entity class should not have any business logic.
 - **dao**
 - Create Service Provider interface/abstract class to showcase functionalities.
 - Create the implementation class for the above interface/abstract class with db interaction.
 - **exception**
 - Create user defined exceptions in this package and handle exceptions whenever needed.
 - **util**
 - Create a DBPropertyUtil class with a static function which takes property file name as parameter and returns connection string.
 - Create a DBConnUtil class which holds static method which takes connection string as parameter file and returns connection object.
 - **main**
 - Create a class MainModule and demonstrate the functionalities in a menu driven application.

You are working as a database administrator for a fictional company named "TechShop," which sells electronic gadgets. TechShop maintains data related to their products, customers, and orders. Your task is to design and implement a database for TechShop based on the following requirements:

Implement OOPs

Task 1: Classes and Their Attributes:

You are working as a software developer for TechShop, a company that sells electronic gadgets. Your task is to design and implement an application using Object-Oriented Programming (OOP) principles to manage customer information, product details, and orders. Below are the classes you need to create:

Customers Class:

Attributes:

- CustomerID (int)
- FirstName (string)
- LastName (string)
- Email (string)
- Phone (string)
- Address (string)

Methods:

- CalculateTotalOrders(): Calculates the total number of orders placed by this customer.
- GetCustomerDetails(): Retrieves and displays detailed information about the customer.
- UpdateCustomerInfo(): Allows the customer to update their information (e.g., email, phone, or address).

Products Class:

Attributes:

- ProductID (int)
- ProductName (string)
- Description (string)
- Price (decimal)

Methods:

- GetProductDetails(): Retrieves and displays detailed information about the product.
- UpdateProductInfo(): Allows updates to product details (e.g., price, description).
- IsProductInStock(): Checks if the product is currently in stock.

Orders Class:

Attributes:

- OrderID (int)
- Customer (Customer) - Use composition to reference the Customer who placed the order.
- OrderDate (DateTime)
- TotalAmount (decimal)
- CalculateTotalAmount() - Calculate the total amount of the order.
- GetOrderDetails(): Retrieves and displays the details of the order (e.g., product list and quantities).
- UpdateOrderStatus(): Allows updating the status of the order (e.g., processing, shipped).
- CancelOrder(): Cancels the order and adjusts stock levels for products.

OrderDetails Class:

Attributes:

- OrderDetailID (int)
- Order (Order) - Use composition to reference the Order to which this detail belongs.
- Product (Product) - Use composition to reference the Product included in the order detail.
- Quantity (int)

Methods:

- CalculateSubtotal() - Calculate the subtotal for this order detail.
- GetOrderDetailInfo(): Retrieves and displays information about this order detail.
- UpdateQuantity(): Allows updating the quantity of the product in this order detail.
- AddDiscount(): Applies a discount to this order detail.

Inventory class:

Attributes:

- InventoryID(int)
- Product (Composition): The product associated with the inventory item.
- QuantityInStock: The quantity of the product currently in stock.
- LastStockUpdate

Methods:

- GetProduct(): A method to retrieve the product associated with this inventory item.
- GetQuantityInStock(): A method to get the current quantity of the product in stock.
- AddToInventory(int quantity): A method to add a specified quantity of the product to the inventory.
- RemoveFromInventory(int quantity): A method to remove a specified quantity of the product from the inventory.
- UpdateStockQuantity(int newQuantity): A method to update the stock quantity to a new value.
- IsProductAvailable(int quantityToCheck): A method to check if a specified quantity of the product is available in the inventory.
- GetInventoryValue(): A method to calculate the total value of the products in the inventory based on their prices and quantities.
- ListLowStockProducts(int threshold): A method to list products with quantities below a specified threshold, indicating low stock.
- ListOutOfStockProducts(): A method to list products that are out of stock.