**Assignment On: "TechShop, an electronic gadgets shop"**

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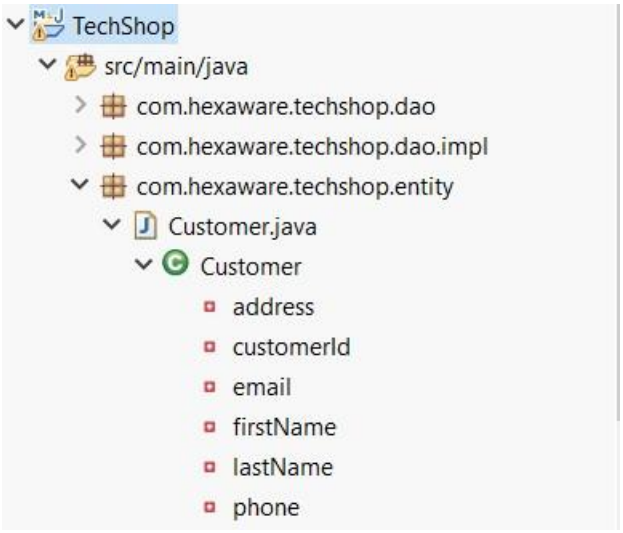
## Implement OOPs

### Task 1: Classes and Their Attributes:

**Customers Class:**

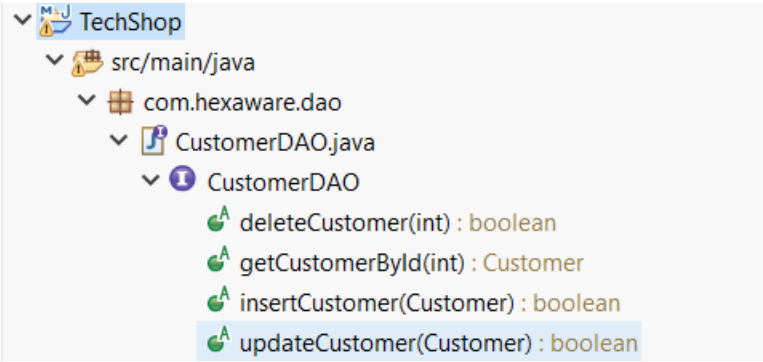
Attributes:

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




Methods:

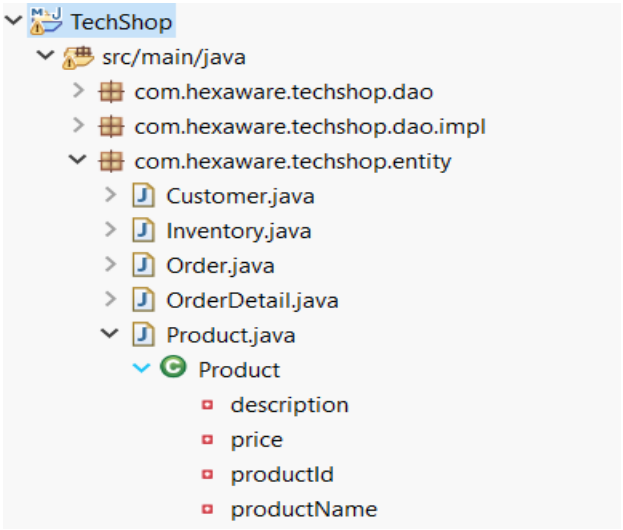
- CalculateTotalOrders(): Calculates the total number of orders placed by this customer.
- GetCustomerDetails(): Retrieves and displays detailed information about the customer.
- UpdateCustomerInfo(): Allows the customer to update their information (e.g., email, phone, or address).




**Products Class:**

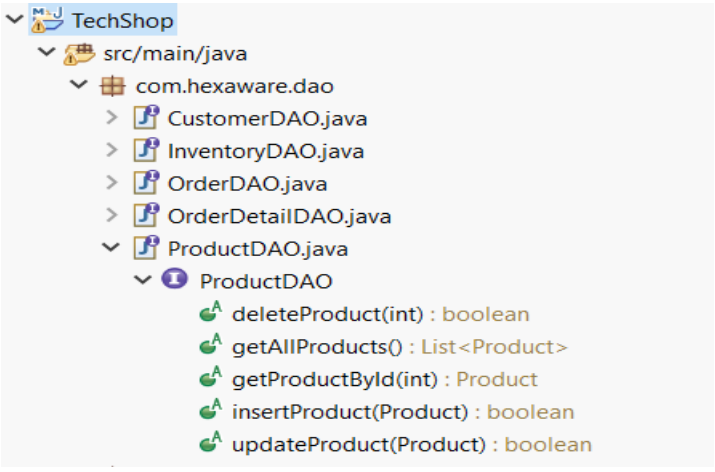
Attributes:

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




Methods:

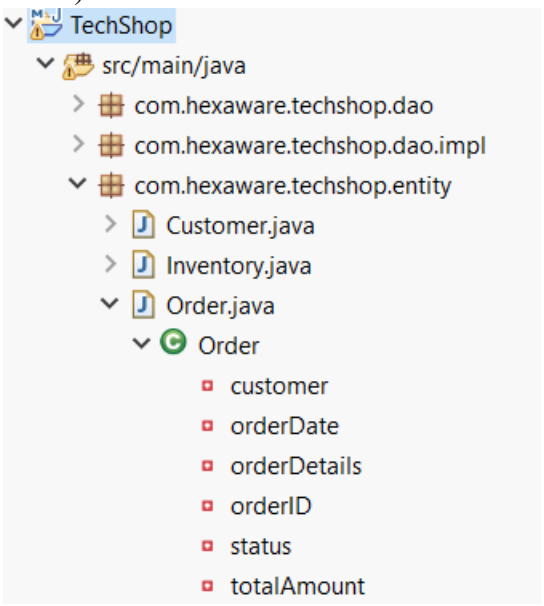
- GetProductDetails(): Retrieves and displays detailed information about the product.
- UpdateProductInfo(): Allows updates to product details (e.g., price, description).
- IsProductInStock(): Checks if the product is currently in stock.



**Orders Class:**

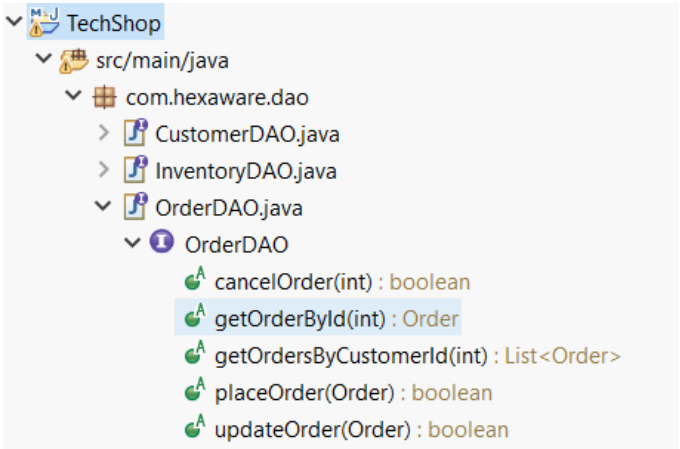
Attributes:

- OrderID (int)
- Customer (Customer) - Use composition to reference the Customer who placed the order.
- OrderDate (DateTime)
- TotalAmount (decimal)




Methods:

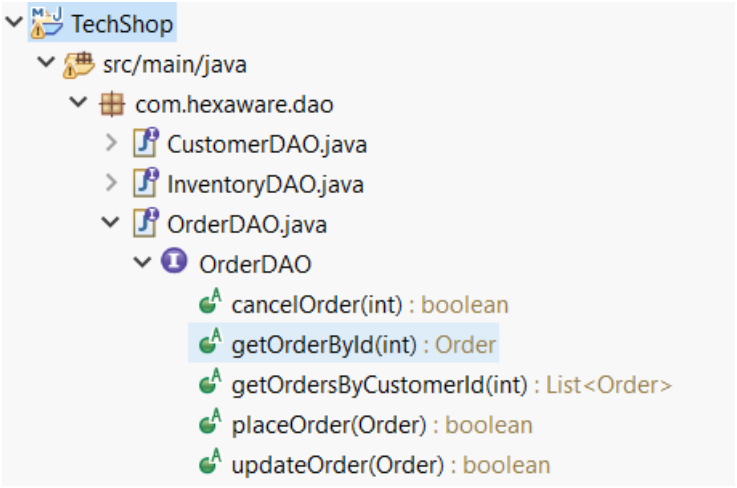
- CalculateTotalAmount() - Calculate the total amount of the order.
- GetOrderDetails(): Retrieves and displays the details of the order (e.g., product list and
- quantities).
- UpdateOrderStatus(): Allows updating the status of the order (e.g., processing, shipped).
- CancelOrder(): Cancels the order and adjusts stock levels for products.



**OrderDetails Class:**

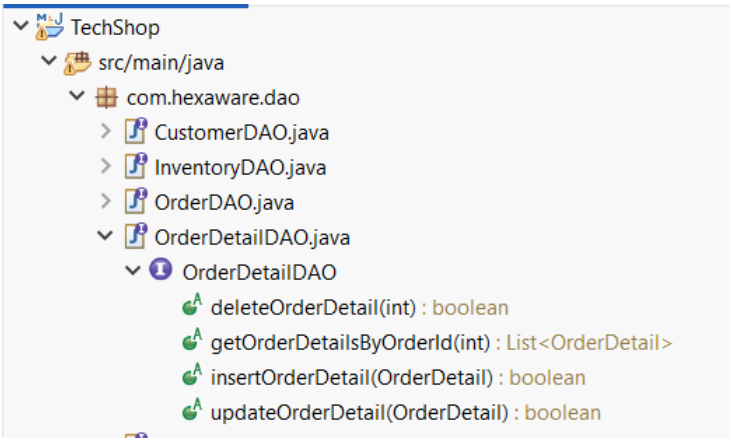
Attributes:

- 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:

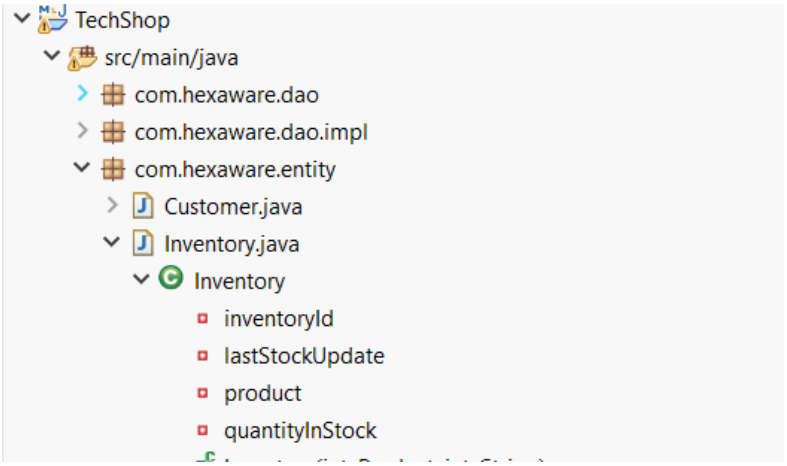
- CalculateSubtotal() - Calculate the subtotal for this order detail.
- GetOrderDetailInfo(): Retrieves and displays information about this order detail.
- UpdateQuantity(): Allows updating the quantity of the product in this order detail.
- AddDiscount(): Applies a discount to this order detail.




**Inventory class:**

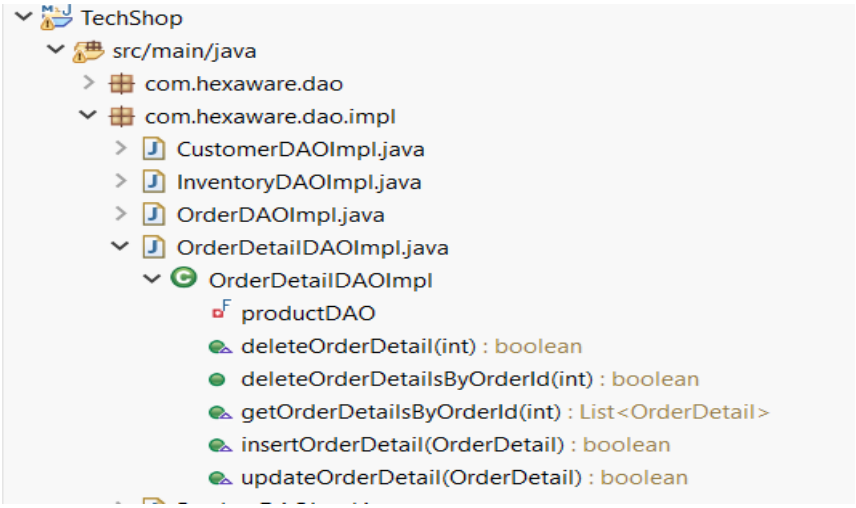
Attributes:

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

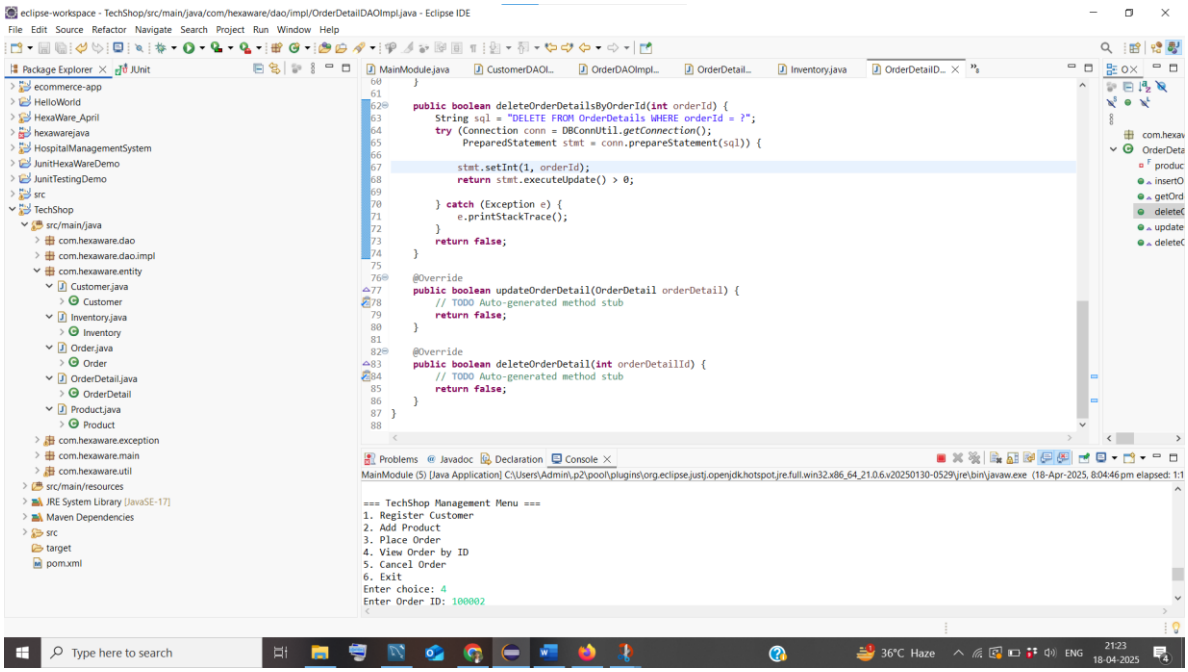



Methods:

- 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.

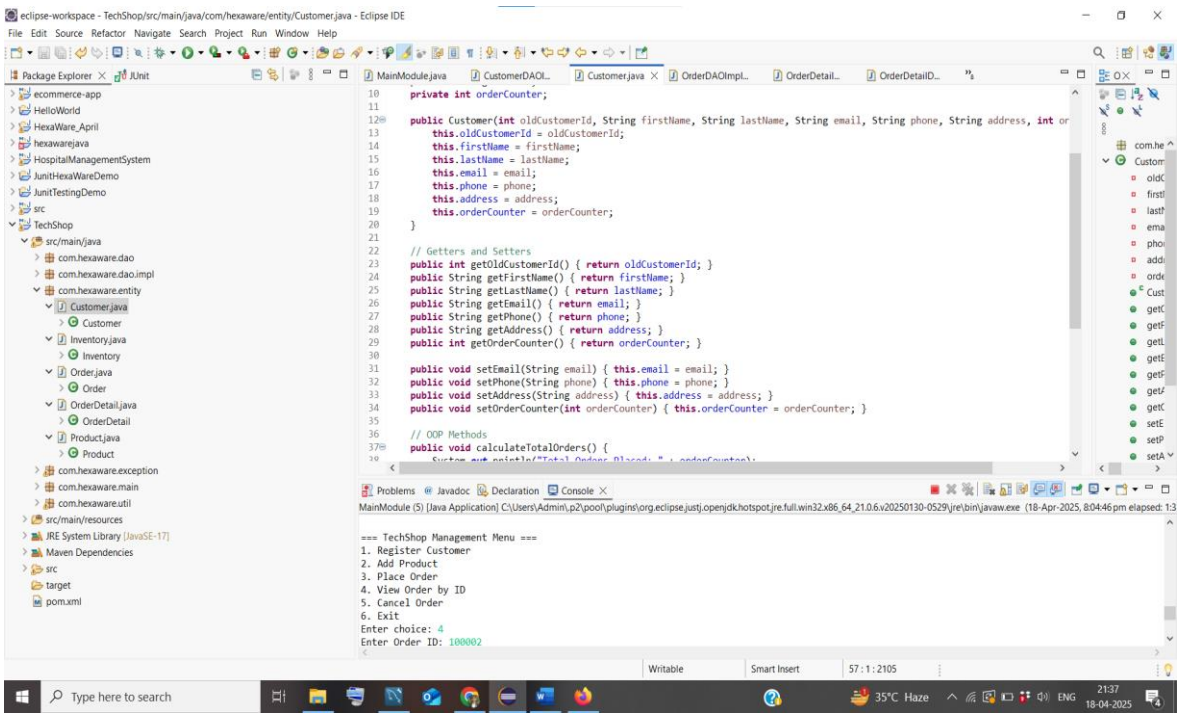


## Task 2: Class Creation

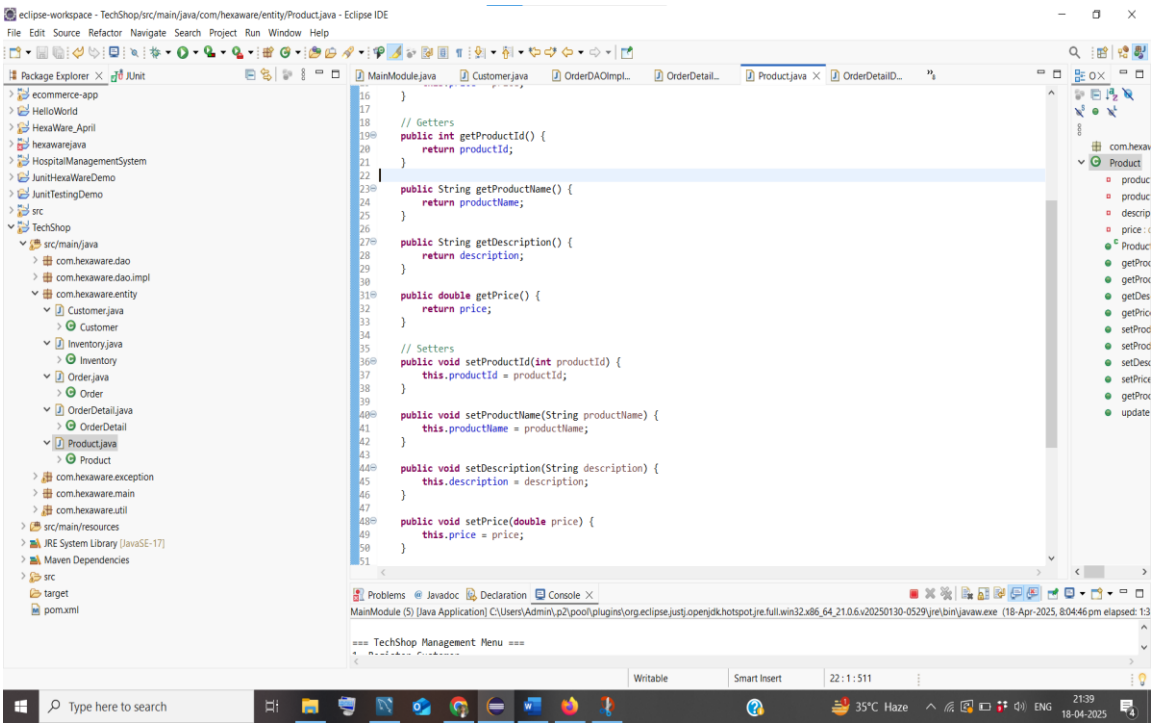



## Task 3: Encapsulation:

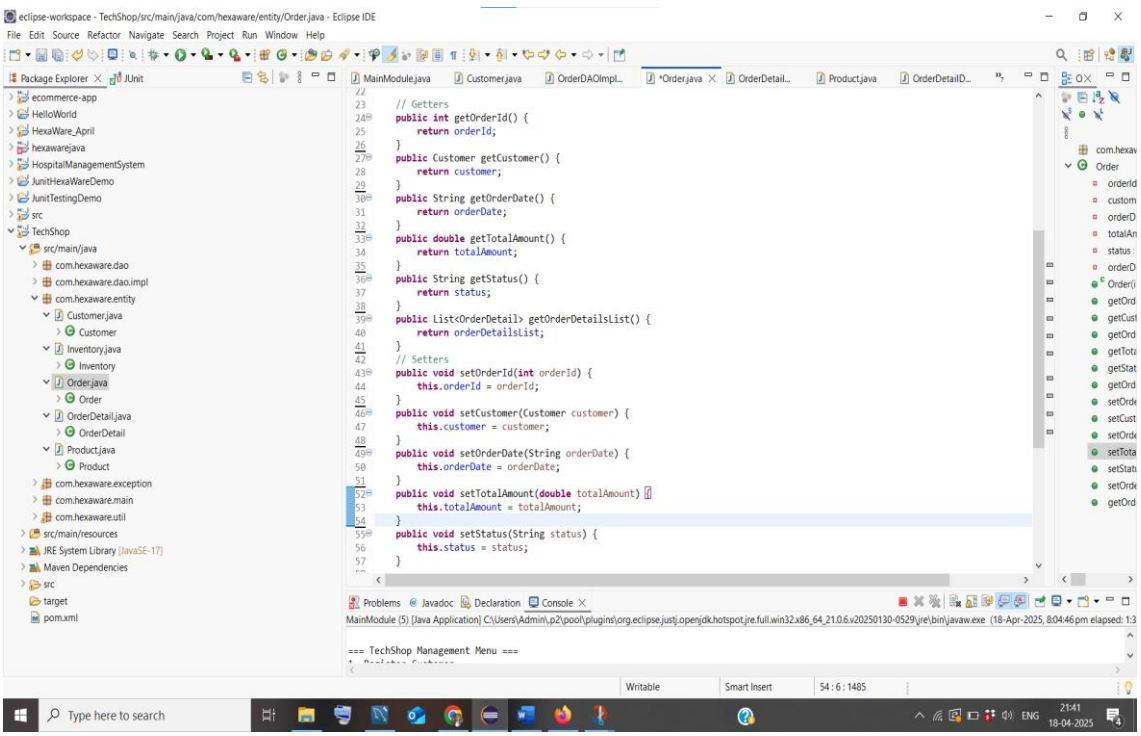
- **Customers(getter & setter)**



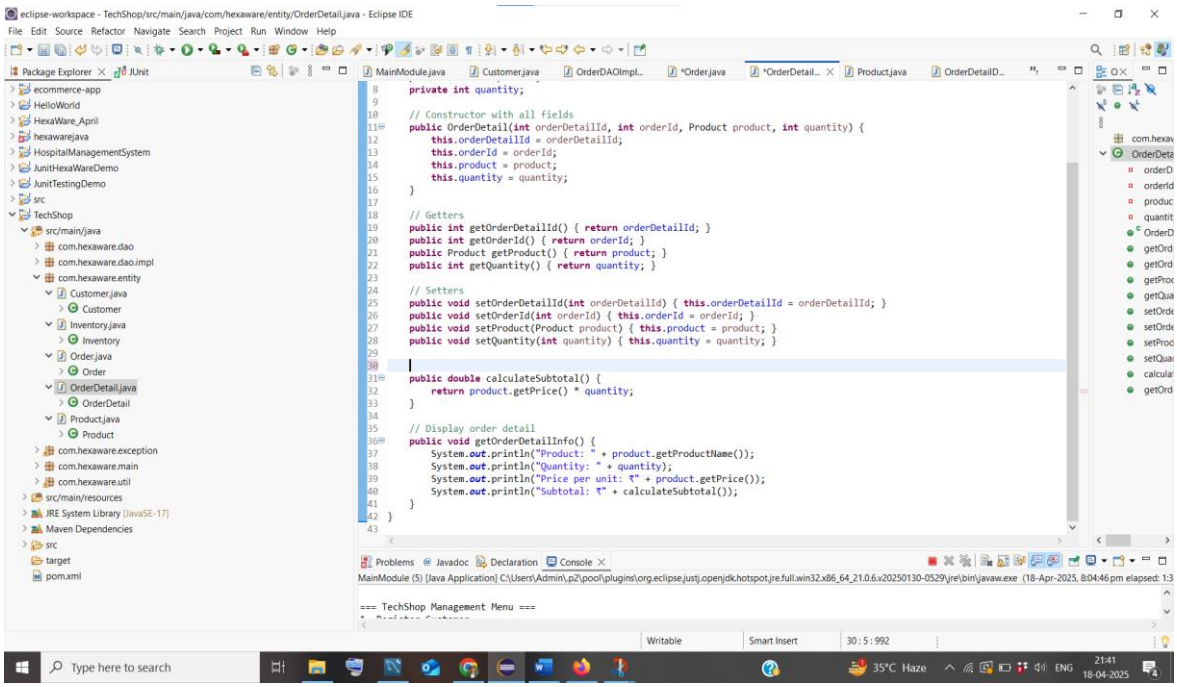
- **Product (getter & setter)**



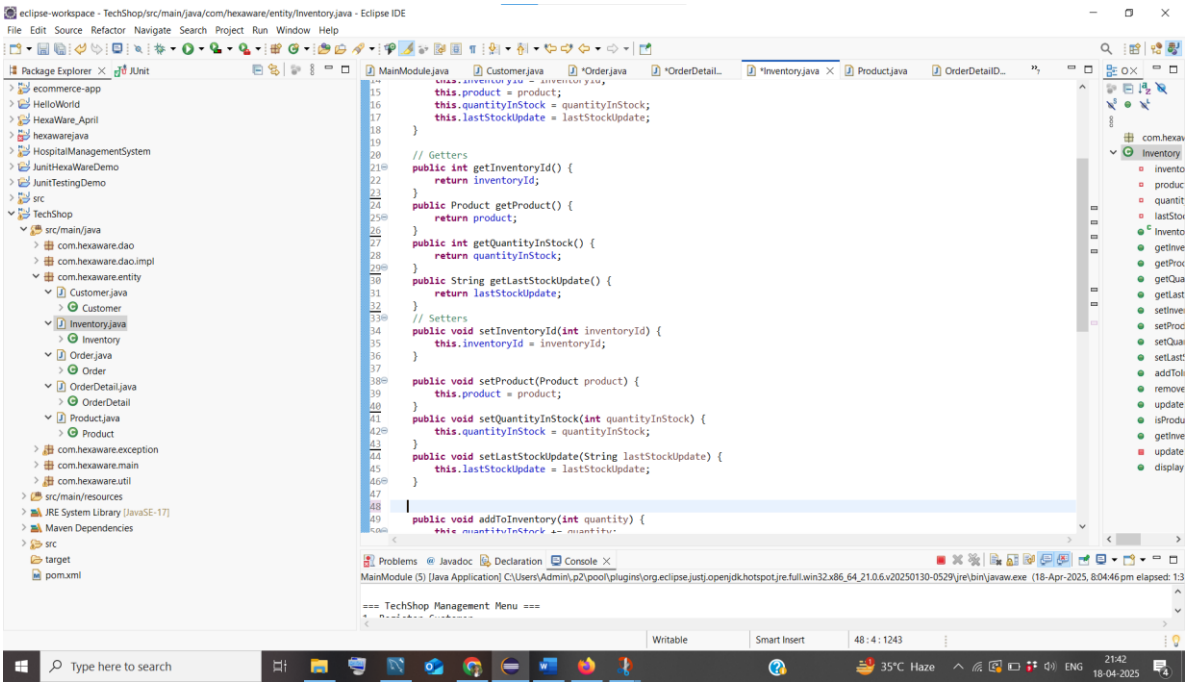

- **Order (getter & setter)**



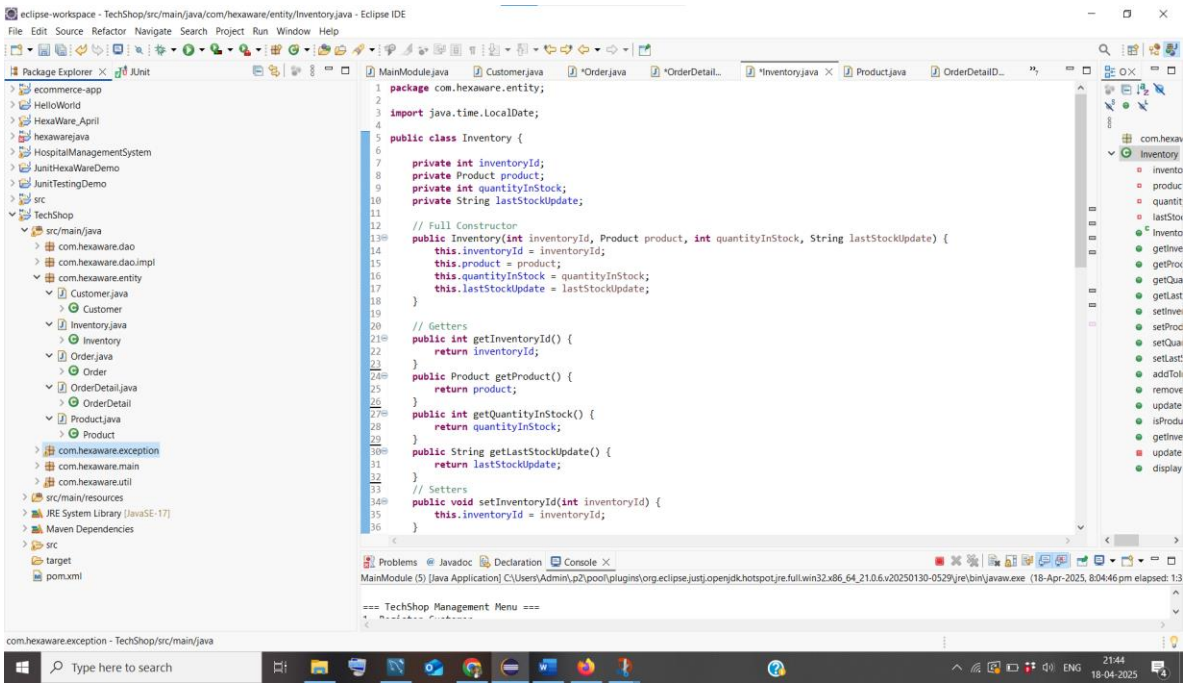
- **Orderdetails (getter & setter)**



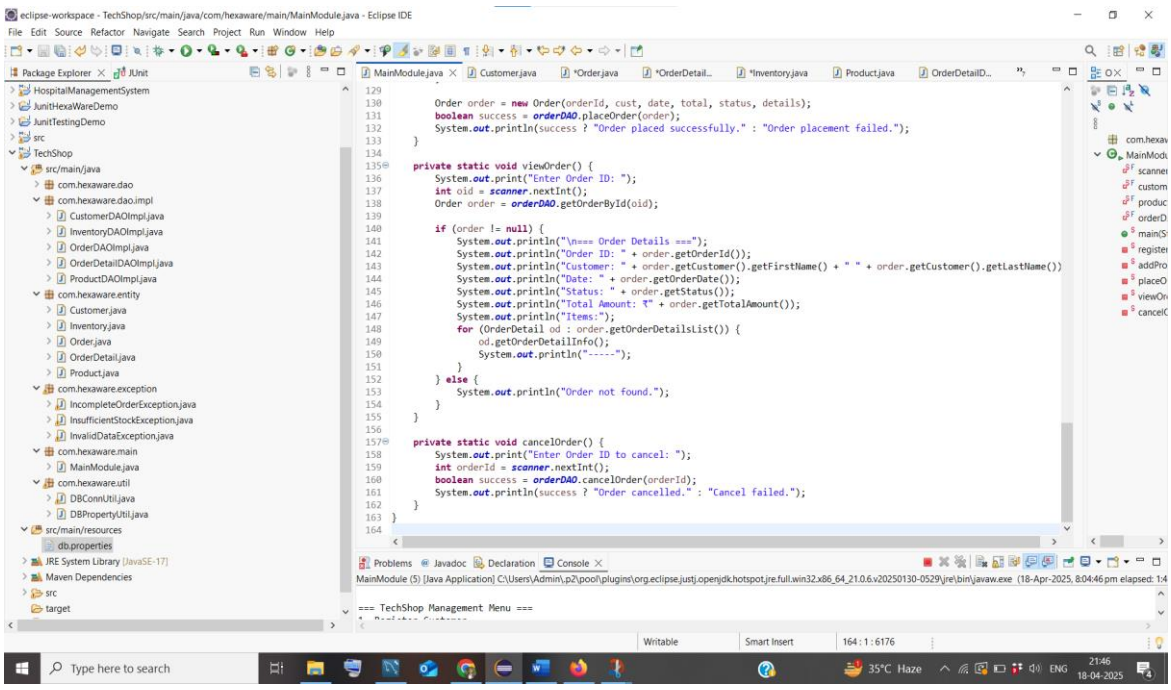

- **Inventory (getter & setter)**



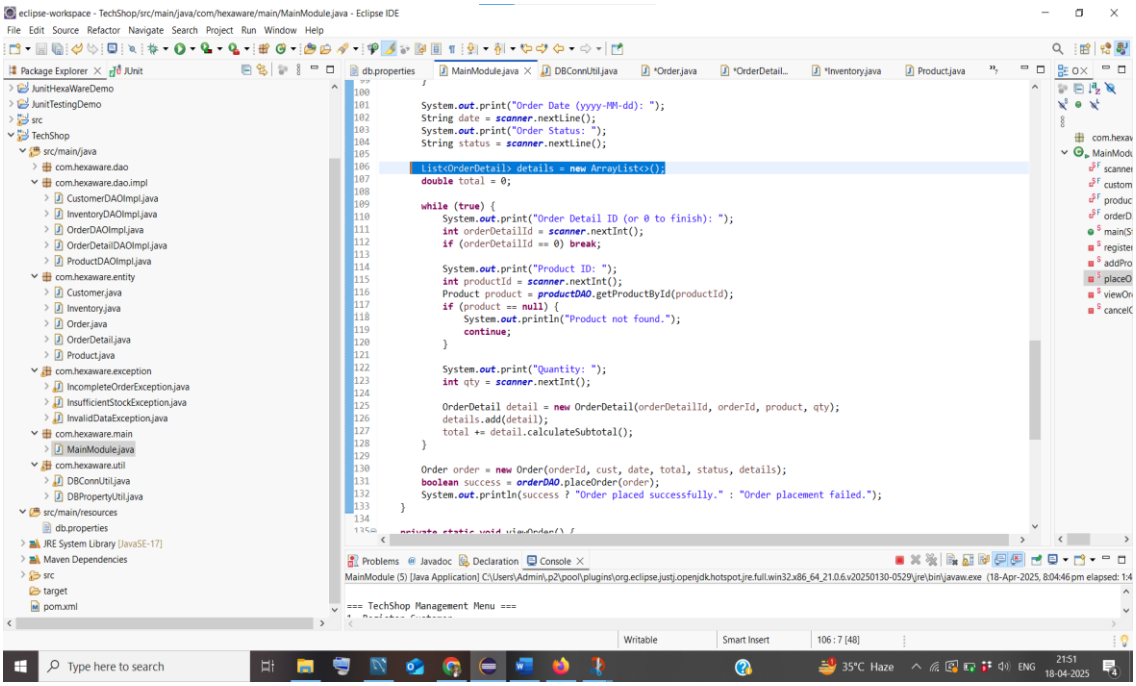
## Task 4: Composition



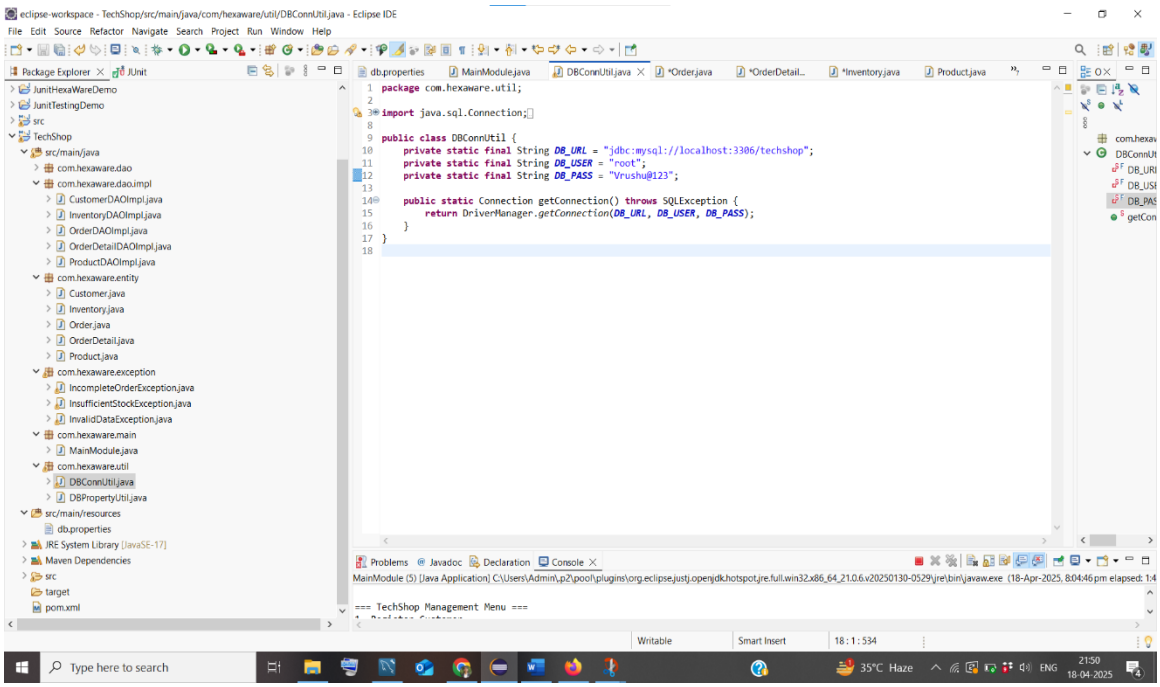

## Task 5: Exceptions handling



## Task 6: Collections




## Task 7: Database Connectivity



**Project Output**

- **Register Customer**

```
=== TechShop Management Menu ===
1. Register Customer
2. Add Product
3. Place Order
4. View Order by ID
5. Cancel Order
6. Exit
Enter choice: 1
Old Customer ID: 115
First Name: rayan
Last Name: roy
Email: rayan@gmail.com
Phone: 8529637412
Address: Mumbai
Order Counter: 1
Customer registered successfully.
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

| oldcustomerID | FirstName | LastName | Email | Phone | Address | OrderCount | orderCounter |
|---|---|---|---|---|---|---|---|
| 105 | Kiran | Singh | kiransingh@email.com | 9632585621 | Mumbai | 1 | 0 |
| 106 | David | Miller | david.miller@email.com | 9519511594 | Kolkata | 1 | 0 |
| 107 | Vismay | Wagh | vismaywagh@email.com | 8888232321 | Chennai | 1 | 0 |
| 108 | Farah | Moore | frarahmoore@email.com | 7854442222 | Chennai | 1 | 0 |
| 109 | Anjali | Sharma | anjali@email.com | 7778889999 | Mumbai | 1 | 0 |
| 110 | Vishal | Raj | vishalraj1@email.com | 9991112222 | Bangalore | 1 | 0 |
| 111 | Raj | Roy | rajroy@example.com | 9638522589 | Tamilnadu | 0 | 0 |
| 112 | vrushu | NULL | vru@gmail.com | 2356897845 | nagpur | NULL | 0 |
| 113 | joh | NULL | johleh@gmail.com | 8954621321 | Delhi | NULL | 0 |
| 115 | rayan | roy | rayan@gmail.com | 8529637412 | Mumbai | NULL | 1 |

- **Add Product**

```
=== TechShop Management Menu ===
1. Register Customer
2. Add Product
3. Place Order
4. View Order by ID
5. Cancel Order
6. Exit
Enter choice: 2
Product ID: 13
Product Name: HP Laptop
Description: Latest Model
Price: 950000
Product added successfully.
```

Result Grid | Filter Rows: | Edit: | Export/Import:

| ProductID | ProductName | Description | Price |
|---|---|---|---|
| 4 | Headphones | Noise-canceling headphones | 209.00 |
| 5 | Smartwatch | Wearable fitness tracker | 1540.00 |
| 6 | Monitor | 24-inch HD monitor | 26400.00 |
| 7 | Keyboard | Mechanical keyboard | 880.00 |
| 8 | Mouse | Wireless mouse | 539.00 |
| 9 | Printer | All-in-one printer | 18700.00 |
| 10 | External Hard Drive | 1TB portable storage | 1320.00 |
| 11 | Earbuds | LatestModel | 90000.00 |
| 12 | Smartphone | Latest model smartphone | 60000.00 |
| 13 | HP Laptop | Latest Model | 950000.00 |
| NULL | NULL | NULL | NULL |

- **Place Order**

```
=== TechShop Management Menu ===
1. Register Customer
2. Add Product
3. Place Order
4. View Order by ID
5. Cancel Order
6. Exit
Enter choice: 3
Order ID: 10011
Customer Old ID: 111
Order Date (yyyy-MM-dd): 2025-04-19
Order Status: shipped
Order Detail ID (or 0 to finish): 0
Order placed successfully.
```

Result Grid | Filter Rows: | Edit: | Exp

| OrderID | CustomerID | OrderDate | TotalAmount | Status |
|---|---|---|---|---|
| 10001 | 100 | 2024-04-01 | 209000.00 | Shipped |
| 10002 | 101 | 2024-04-02 | 363000.00 | Shipped |
| 10003 | 103 | 2024-04-03 | 2640000.00 | Shipped |
| 10004 | 104 | 2024-04-04 | 14630.00 | Shipped |
| 10005 | 105 | 2024-04-05 | 1309000.00 | Shipped |
| 10006 | 106 | 2024-04-06 | 14256000.00 | Shipped |
| 10007 | 107 | 2024-04-07 | 378400.00 | Shipped |
| 10008 | 108 | 2024-04-08 | 16170.00 | Shipped |
| 10009 | 109 | 2024-04-09 | 748000.00 | Shipped |
| 10010 | 110 | 2024-04-10 | 852269 | Shipped |
| NULL | NULL | NULL | NULL | NULL |

- **View Order By ID**
- **Cancel Order**

```
=== TechShop Management Menu ===
1. Register Customer
2. Add Product
3. Place Order
4. View Order by ID
5. Cancel Order
6. Exit
Enter choice: 4
Enter Order ID: 100002
Order not found.

=== TechShop Management Menu ===
1. Register Customer
2. Add Product
3. Place Order
4. View Order by ID
5. Cancel Order
6. Exit
Enter choice: 5
Enter Order ID to cancel: 100011
Cancel failed.
```