

Assignment 1

Task 1: Classes and Their Attributes:

Task 2: Class Creation:

- Create the classes (Customers, Products, Orders, OrderDetails and Inventory) with the specified attributes.
- Implement the constructor for each class to initialize its attributes.
- Implement methods as specified.

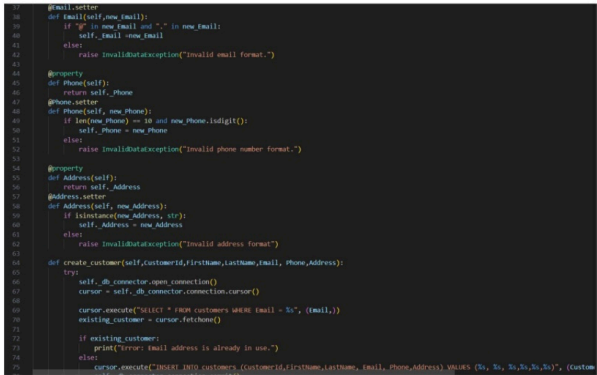
Customers Class:

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).



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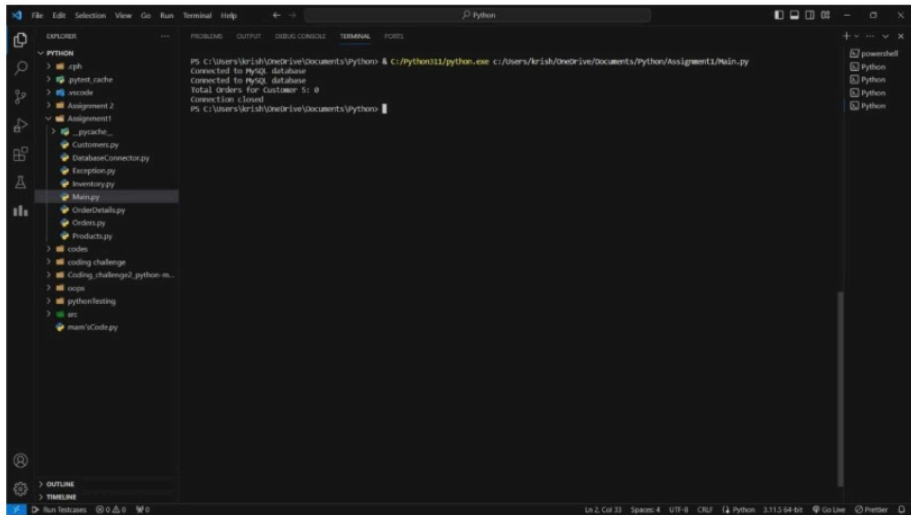
73         print(f"error: email address is already in use.")
74     else:
75         cursor.execute("INSERT INTO customers (CustomerId,FirstName,LastName, Email, Phone,Address) VALUES (%s, %s, %s,%s,%s,%s)", (Customerid,
76         self._db_connector.connection.commit()
77         print("customer created successfully")
78
79     except Exception as e:
80         print(f"Error: {e}")
81
82     finally:
83         if cursor:
84             cursor.close()
85         self._db_connector.close_connection()
86
87     def calculate_Total_Orders(self,Customerid):
88         try:
89             self._db_connector.open_connection()
90             query = """ SELECT COUNT(Orderrid) AS TotalOrders FROM Orders
91             WHERE Customerid = %s"""
92             values = (Customerid,)
93             self._db_connector.cursor.execute(query, values)
94             result = self._db_connector.cursor.fetchone()
95
96             if result:
97                 total_orders = result[0]
98                 print(f"Total Orders for Customer {Customerid}: {total_orders}")
99             else:
100                 print("No orders found for this customer")
101
102     except Exception as e:
103         print(f"Error calculating total orders: {e}")
104     finally:
105         self._db_connector.close_connection()
106
107     def get_Customer_Details(self,Customerid):
108         try:
109             self._db_connector.open_connection()
110
111             query = "SELECT * FROM customers WHERE Customerid=%s"

```

```

114             self._db_connector.cursor.execute(query,values)
115
116             customer_details=self._db_connector.cursor.fetchone()
117
118             if customer_details:
119                 print("Customer Details:")
120                 print(f"Customer ID: {customer_details[0]}")
121                 print(f"First Name: {customer_details[1]}")
122                 print(f"Last Name: {customer_details[2]}")
123                 print(f"Email: {customer_details[3]}")
124                 print(f"Phone: {customer_details[4]}")
125                 print(f"Address: {customer_details[5]}")
126             else:
127                 print("customer not found.")
128
129     except Exception as e:
130         print(f"Error getting customer details: {e}")
131
132     finally:
133         self._db_connector.close_connection()
134
135
136     def update_customer_Info(self,Customerid,new_Email,new_Phone,new_Address):
137         try:
138             self._db_connector.open_connection()
139
140             query="UPDATE customers SET Email=%s,Phone=%s, Address=%s WHERE Customerid=%s"
141             values=(new_Email,new_Phone,new_Address,Customerid)
142
143             with self._db_connector.connection.cursor() as cursor:
144                 cursor.execute(query,values)
145             self._db_connector.connection.commit()
146             print("Customer account updated successfully")
147         except Exception as e:
148             print(f"Error updating customer account :{e}")
149         finally:
150             self._db_connector.close_connection()

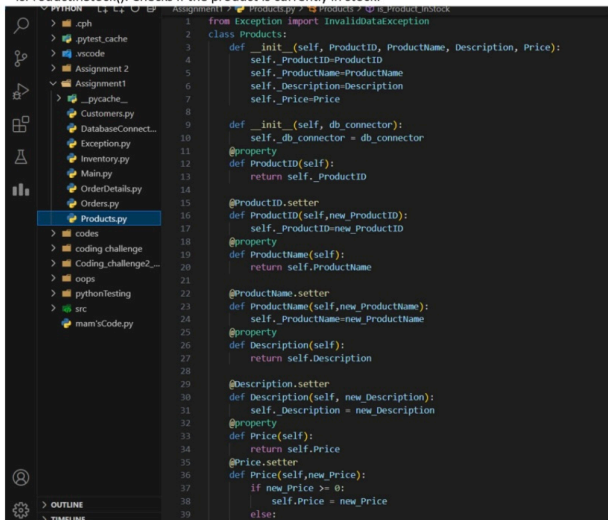
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- Description (string)
- Price (decimal)

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.



```

1  from Exception import InvalidDataException
2  class Products:
3
4      def __init__(self, ProductID, ProductName, Description, Price):
5          self._ProductID=ProductID
6          self._ProductName=ProductName
7          self._Description=Description
8          self._Price=Price
9
10     def __init__(self, db_connector):
11         self._db_connector = db_connector
12
13     @property
14     def ProductID(self):
15         return self._ProductID
16
17     @ProductID.setter
18     def ProductID(self, new_ProductID):
19         self._ProductID=new_ProductID
20
21     @property
22     def ProductName(self):
23         return self._ProductName
24
25     @ProductName.setter
26     def ProductName(self, new_ProductName):
27         self._ProductName=new_ProductName
28
29     @property
30     def Description(self):
31         return self._Description
32
33     @Description.setter
34     def Description(self, new_Description):
35         self._Description = new_Description
36
37     @property
38     def Price(self):
39         return self._Price
40
41     @Price.setter
42     def Price(self, new_Price):
43         if new_Price >= 0:
44             self._Price = new_Price
45         else:

```

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def get_product_details(self,ProductID):
    try:
        self._db_connector.open_connection()

        query = "SELECT * FROM products WHERE ProductID=%s"
        values = (ProductID,)

        self._db_connector.cursor.execute(query, values)

        product_details = self._db_connector.cursor.fetchone()

        if product_details:
            print("Product Details:")
            print(f"Product ID: {product_details[0]}")
            print(f"Product Name: {product_details[1]}")
            print(f"Description : {product_details[2]}")
            print(f"Price: {product_details[3]}")

        else:
            print("Product Id not found.")

    except Exception as e:
        print(f"Error getting Product details: {e}")

    finally:
        self._db_connector.close_connection()

def update_Product_Info(self,ProductID,new_Description,new_Price):
    try:
        self._db_connector.open_connection()

        query="UPDATE Products SET Description=%s,Price=%s WHERE ProductID=%s"
        values=(new_Description,new_Price,ProductID)

        with self._db_connector.connection.cursor() as cursor:
            cursor.execute(query, values)
        self._db_connector.connection.commit()
        print("Product Details updated successfully")

    except Exception as e:
```

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        cursor.execute(query, values)
        self._db_connector.connection.commit()
        print("Product Details updated successfully")

    except Exception as e:
        print(f"Error updating Product Details :{e}")

    finally:
        self._db_connector.close_connection()

def is_Product_InStock(self,ProductID):
    try:
        self._db_connector.open_connection()

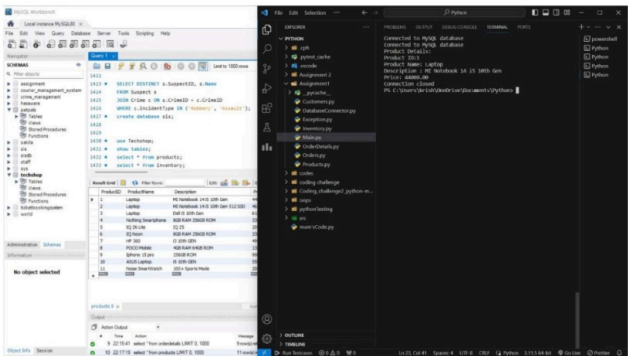
        query = "SELECT QuantityInStock FROM Inventory WHERE ProductID = %s"
        values = (ProductID,)

        self._db_connector.cursor.execute(query, values)
        quantity_in_stock = self._db_connector.cursor.fetchone()

        if quantity_in_stock[0]>0:
            print("Product is in stock and stockquantity is",quantity_in_stock[0])
        else:
            print("Product is not in stock")

    except Exception as e:
        print(f"Error checking product stock: {e}")
        return False

    finally:
        self._db_connector.close_connection()
```

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.

```
1 from datetime import datetime
2 from Exception import InvalidDataException
3
4 class Orders:
5     def __init__(self, OrderID, CustomerID, OrderDate):
6         self._OrderID = OrderID
7         self._CustomerID = CustomerID
8         self._OrderDate = OrderDate
9         self._TotalAmount = 0
10
11     def __init__(self, db_connector):
12         self._db_connector = db_connector
13
14     @property
15     def OrderID(self):
16         return self._OrderID
17     @OrderID.setter
18     def OrderID(self, new_OrderID):
19         self._OrderID = new_OrderID
20
21     @property
22     def CustomerID(self):
23         return self._CustomerID
24     @CustomerID.setter
25     def CustomerID(self, new_CustomerID):
26         self._CustomerID = new_CustomerID
27
28     @property
29     def OrderDate(self):
30         return self._OrderDate
31     @OrderDate.setter
32     def OrderDate(self, new_OrderDate):
33         self._OrderDate = new_OrderDate
34
35     @property
36     def TotalAmount(self):
37         return self._TotalAmount
38     @TotalAmount.setter
39     def TotalAmount(self, new_TotalAmount):
40
41         if isinstance(new_TotalAmount, (int, float)) and new_TotalAmount >= 0:
42             self._TotalAmount = new_TotalAmount
```

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def get_Order_Details(self, OrderID):
    try:
        self._db_connector.open_connection()

        query = "SELECT * FROM orders WHERE OrderID=%s"
        values = (OrderID,)

        self._db_connector.cursor.execute(query, values)

        order_details = self._db_connector.cursor.fetchone()

        if order_details:
            print("Order Details:")
            print("Order ID: %s" % order_details[0])
            print("Customer ID: %s" % order_details[1])
            print("Order Date: %s" % order_details[2])
            print("Total Amount: %s" % order_details[3])
        else:
            print("Order ID not found.")

    except Exception as e:
        print("Error getting Order details: %s" % e)

    finally:
        self._db_connector.close_connection()

def place_order(self, OrderID, OrderDetailID, CustomerID, ProductID, Quantity):
    try:
        self._db_connector.open_connection()

        query = "INSERT INTO orders (OrderID, CustomerID, OrderDate) VALUES (%s, %s, %s)"
        values = (OrderID, CustomerID, datetime.now())

        with self._db_connector.connection.cursor() as cursor1:
            cursor1.execute(query, values)

        query_details = "INSERT INTO OrderDetails (OrderDetailID, OrderID, ProductID, Quantity) VALUES (%s, %s, %s, %s)"
        values_details = (OrderDetailID, OrderID, ProductID, Quantity)
```

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        with self._db_connector.connection.cursor() as cursor2:
            cursor2.execute(query_details, values_details)

        query_update_inventory = "UPDATE Inventory SET QuantityInStock = QuantityInStock - %s WHERE ProductID = %s"
        values_update_inventory = (Quantity, ProductID)
        with self._db_connector.connection.cursor() as cursor3:
            cursor3.execute(query_update_inventory, values_update_inventory)

        query_total_amount = """
        SELECT SUM(Products.Price * OrderDetails.Quantity)
        FROM OrderDetails
        JOIN Products ON OrderDetails.ProductID = Products.ProductID
        WHERE OrderDetails.OrderID = %s
        """

        with self._db_connector.connection.cursor() as cursor4:
            cursor4.execute(query_total_amount, (OrderID,))
            total_amount = cursor4.fetchone()[0]

        query_update_total_amount = "UPDATE Orders SET TotalAmount = %s WHERE OrderID = %s"
        values_update_total_amount = (total_amount, OrderID)
        with self._db_connector.connection.cursor() as cursor5:
            cursor5.execute(query_update_total_amount, values_update_total_amount)

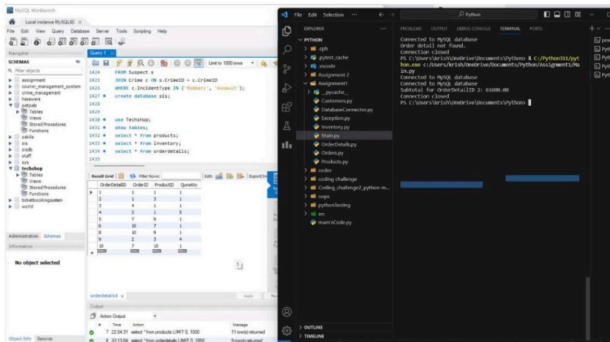
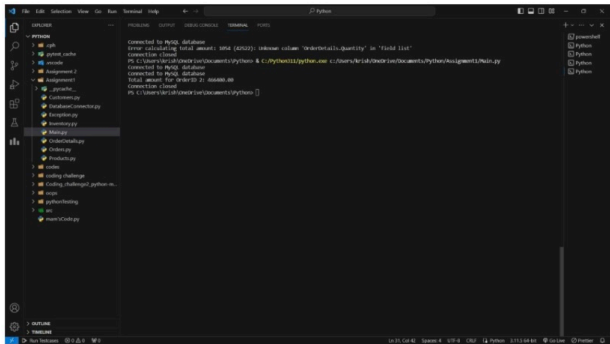
        self._db_connector.connection.commit()

        print("Order placed successfully. OrderID: %s OrderTotal: %s and Inventory updated with available stock")
    except Exception as e:
        print("Error placing order: %s" % e)

    finally:
        self._db_connector.close_connection()

def updateOrderStatus(self):
    # no status table in database schema
    pass

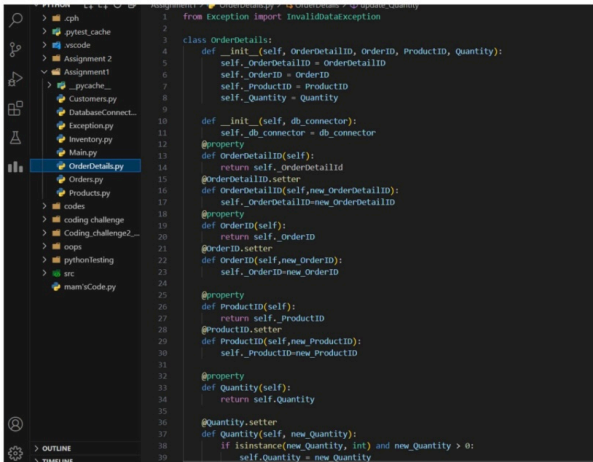
def cancelOrder(self):
    # no status table in database schema
    pass
```



- 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.



```
1 from Exception import InvalidDataException
2
3 class OrderDetails:
4     def __init__(self, OrderDetailID, OrderID, ProductID, Quantity):
5         self._OrderDetailID = OrderDetailID
6         self._OrderID = OrderID
7         self._ProductID = ProductID
8         self._Quantity = Quantity
9
10    def __init__(self, db_connector):
11        self._db_connector = db_connector
12
13    @property
14    def OrderDetailID(self):
15        return self._OrderDetailID
16    @OrderDetailID.setter
17    def OrderDetailID(self, new_OrderDetailID):
18        self._OrderDetailID = new_OrderDetailID
19
20    @property
21    def OrderID(self):
22        return self._OrderID
23    @OrderID.setter
24    def OrderID(self, new_OrderID):
25        self._OrderID = new_OrderID
26
27    @property
28    def ProductID(self):
29        return self._ProductID
30    @ProductID.setter
31    def ProductID(self, new_ProductID):
32        self._ProductID = new_ProductID
33
34    @property
35    def Quantity(self):
36        return self._Quantity
37
38    @Quantity.setter
39    def Quantity(self, new_Quantity):
40        if isinstance(new_Quantity, int) and new_Quantity > 0:
41            self._Quantity = new_Quantity
```

```

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> Coding_challenge2_... 96
> oops 97
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def calculate_subtotal(self, OrderDetailID):
    try:
        self._db_connector.open_connection()
        query = "SELECT OD.Quantity, P.Price FROM OrderDetails OD INNER JOIN Products P ON OD.ProductID = P.ProductID WHERE OrderDetailID = {OrderDetailID}"
        values = (OrderDetailID,)

        with self._db_connector.cursor as cursor:
            cursor.execute(query, values)
            order_data = cursor.fetchone()

        if order_data:
            quantity, price = order_data
            subtotal = quantity * price
            print(f"Subtotal for OrderDetailID {OrderDetailID}: {subtotal}")
        else:
            print("Order detail not found.")
    except Exception as e:
        print(f"Error calculating subtotal: {e}")
    finally:
        self._db_connector.close_connection()

def get_OrderDetail_Info(self, OrderDetailID):
    try:
        self._db_connector.open_connection()

        query = "SELECT * FROM orderdetails WHERE OrderDetailID={}"
        values = (OrderDetailID,)

        self._db_connector.cursor.execute(query, values)

        orderdetails_details = self._db_connector.cursor.fetchone()

        if orderdetails_details:
            print("OrderDetails details:")
            print(f"OrderDetailID: {orderdetails_details[0]}")
            print(f"OrderID: {orderdetails_details[1]}")
            print(f"ProductID: {orderdetails_details[2]}")
            print(f"Quantity: {orderdetails_details[3]}")

```

```

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print(f"Quantity: {orderdetails_details[3]}")
else:
    print("OrderDetails Id not found.")

except Exception as e:
    print(f"Error getting OrderDetails: {e}")

finally:
    self._db_connector.close_connection()

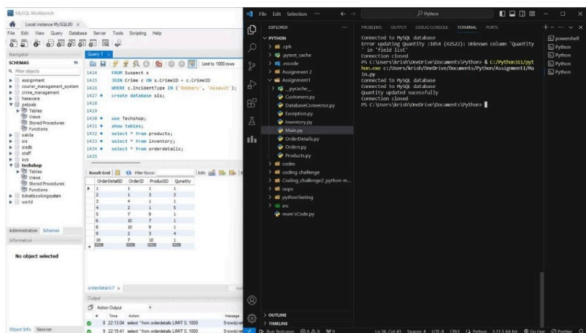
def update_Quantity(self, OrderDetailID, new_Quantity):
    try:
        self._db_connector.open_connection()
        query = "UPDATE OrderDetails SET Quantity={}s where OrderDetailID={}s"
        values = (new_Quantity, OrderDetailID)

        with self._db_connector.connection.cursor() as cursor:
            cursor.execute(query, values)
            self._db_connector.connection.commit()
            print("Quantity updated successfully")

    except Exception as e:
        print(f"Error updating Quantity :{e}")
    finally:
        self._db_connector.close_connection()

def AddDiscount(self, discount_amount):
    try:
        if discount_amount < 0:
            raise InvalidDataException("Invalid discount amount")
    except InvalidDataException as e:
        print(f"Discount not applied: {str(e)}")

```

Inventory class:

Attributes:

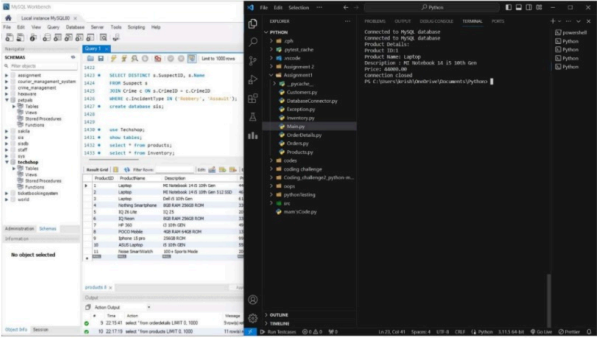
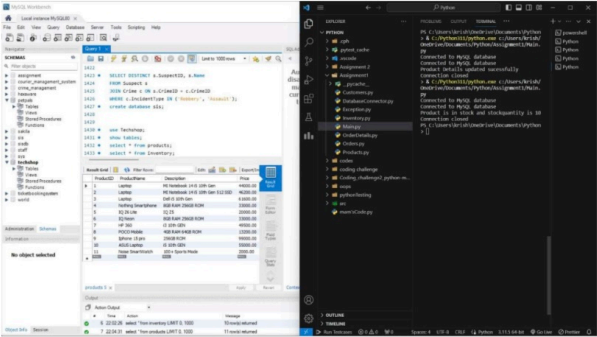
- InventoryID(int)
- Product (Composition): The product associated with the inventory item.
- QuantityInStock: The quantity of the product currently in stock.

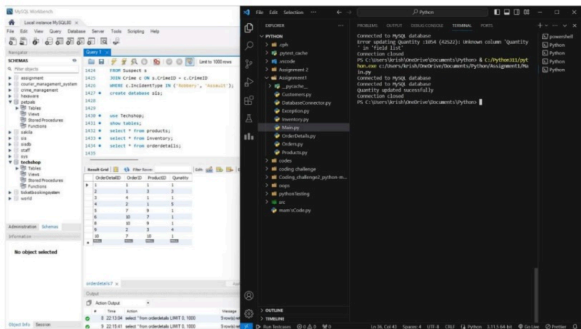
- LastStockUpdate

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
- `ListAllProducts()`: A method to list all products in the inventory, along with their quantities.





The top screenshot shows a successful database connection in VS Code. The console output indicates that the connection to the MySQL database was successful and 2 units were added to the inventory. The table view displays the following data:

InventoryID	ProductID	QuantityOnHand	LastModifiedDate
1	1	20	2023-09-12
2	2	10	2023-09-12
3	3	9	2023-10-09
4	4	8	2023-10-09
5	5	12	2023-10-09
6	6	23	2023-10-09
7	7	30	2023-10-10
8	8	25	2023-10-10
9	9	1	2023-09-10
10	10	25	2023-10-10

The bottom right of the screenshot shows a tooltip with the text: "Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help."

The bottom screenshot shows a failed database connection in VS Code. The console output indicates that the connection to the MySQL database failed. The table view displays the following data:

InventoryID	ProductID	QuantityOnHand	LastModifiedDate
1	1	20	2023-09-12
2	2	10	2023-09-12
3	3	9	2023-10-09
4	4	8	2023-10-09
5	5	12	2023-10-09
6	6	23	2023-10-09
7	7	30	2023-10-10
8	8	25	2023-10-10
9	9	1	2023-09-10
10	10	25	2023-10-10

The bottom right of the screenshot shows a tooltip with the text: "Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help."

