IT-314
Software Engineering

ENGINEERS WITH
SOCIAL RESPONSIBILITY

LAB-6
Modeling Class Diagram and Activity Diagram (Point of Sale System):

Ayushi Jani - 202201141

Develop Use Case Textual Description for "Process Sale" and "Handle Return" use cases.

1. Process Sale

Title:
Process Sale

Description:
This use case describes the process of handling a sale transaction at the POS counter when a customer purchases goods. The cashier scans the goods, applies discounts (if any), and accepts the payment. Upon successful payment, a receipt is printed.

Primary Actor:
Cashier

Secondary Actor:
Customer

Preconditions:

- Cashier must be logged into the POS system.
- POS system is connected to the inventory and catalog systems.

Basic Flow:

1. The cashier initiates a new sale transaction.
2. The cashier scans the barcode of each item.
3. The system retrieves the item details (name, price) from the catalog system.
4. The system updates the stock level by interacting with the inventory system.
5. The cashier applies any available discounts or gift coupons.
6. The customer chooses a payment method (cash, credit card, or check).
7. The cashier completes the payment process.
8. The system prints the receipt.

Alternative Flows:

- **Item Not Found in Catalog:**
    - If the item is not found in the catalog, the system alerts the cashier, who either manually enters the price or informs the customer.
- **Payment Failure:**

    - If the payment fails (e.g., insufficient funds or card declined), the system prompts the cashier to retry payment or choose a different payment method.

Extensions:

- **Discount Application:**
  If a coupon is applied, the system verifies the coupon's validity and adjusts the total price.
- **Multiple Payment Methods:**
  The customer can split the payment between cash, credit card, and check.

Postconditions:

- The sale is completed.
- The inventory is updated.
- The receipt is printed.
- Payment is recorded.

2. Handle Returns

Title:
Handle Returns

Description:
This use case details the process when a customer returns goods to the store. The cashier verifies the return details and processes the return.

Primary Actor:
Cashier

Secondary Actor:
Customer

Preconditions:

- Cashier must be logged into the POS system.
- The goods being returned must be eligible for return (e.g., within return policy period).

Basic Flow:

1. The customer presents the goods to be returned, along with the original receipt.

2. The cashier initiates a return transaction.
3. The cashier scans the goods.
4. The system verifies the purchase history and eligibility for return.
5. The cashier processes the return.
6. The system updates the inventory.
7. The refund is provided to the customer through the original payment method (cash, credit card, or check).
8. A return receipt is printed.

Alternative Flows:

- **No Receipt Provided:**
    - If the customer does not have the receipt, the cashier searches the system for the purchase record using other details like date or transaction ID.
- **Item Not Eligible for Return:**
    - If the item does not meet the return policy (e.g., past return period), the system alerts the cashier, and the return is denied.

Extensions:

- **Partial Return:**
  The customer may choose to return only some of the items, and the system adjusts the refund accordingly.

Postconditions:

- The return is completed.
- The inventory is updated.
- The refund is issued.
- A return receipt is printed.

Identify Entity/Boundary Control Objects:

Entity Objects

- **Product:**

  Represents an item available for sale, including attributes such as name, price, barcode, and stock quantity.

- **Transaction**:

  Represents the transaction where goods are sold to a customer, including details of the items purchased, total amount, discounts, and payment.

- **User**:

  Represents the employee who operates the POS, either as a cashier or administrator.

- **Coupon**:

  Represents a gift coupon used to apply discounts during promotions.

- **Receipt**:

  Represents the printed document provided to the customer after a transaction, containing details of the sale.

Boundary Objects

- **LogIn Interface:**

  The screen that the user interacts with to log in to the POS system.

- **POS Interface:**

  The screen that the cashier interacts with to perform sales, returns, and other functions.

- **Barcode Scanner:**

  Hardware interface used to read product barcodes during a sale or return.

- **Printer**:

  Hardware used to print receipts after a sale or return.

- **Payment System Interface**:

Interface that handles the payment process (e.g., interacting with banks or credit card systems).

- **Inventory System Interface**:

  Interface that communicates with the inventory system to update stock levels.

Control Objects

- **UserController:**

  Manages user login, session handling, and permissions (e.g., cashier vs administrator).

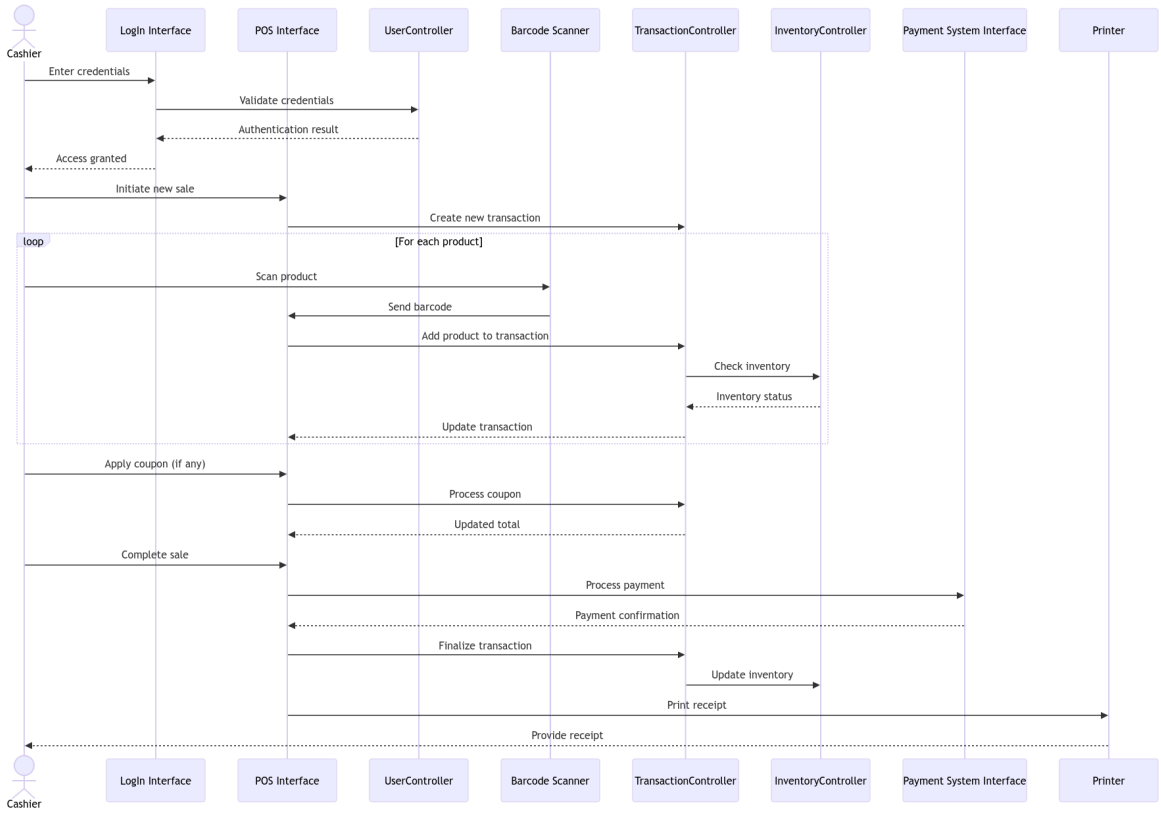
- **TransactionController:**

  Manages all the transactions from start to finish, along with discounts and coupons.

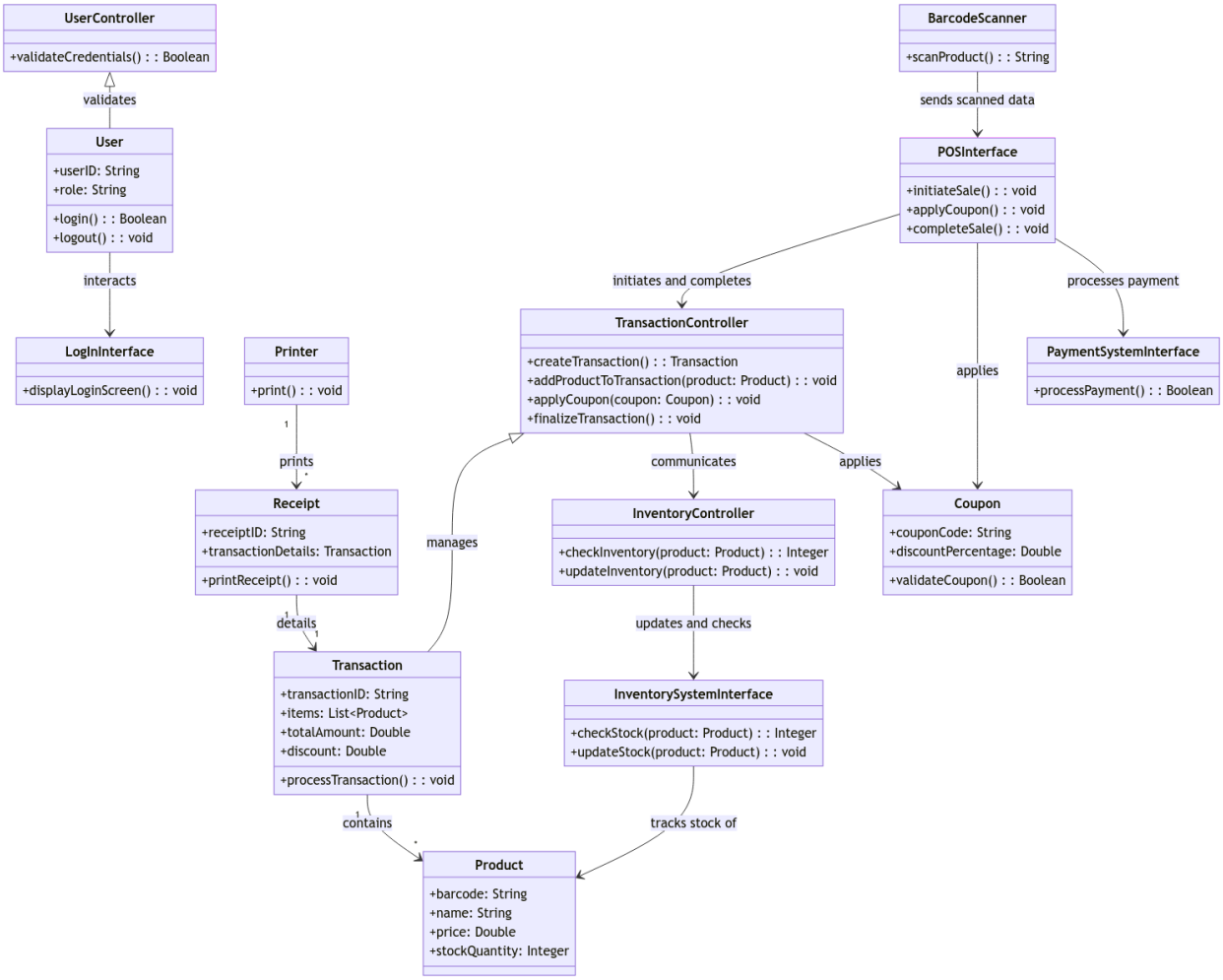
- **InventoryController:**

  Manages updates to stock levels and communicates with the inventory system when products are sold or returned.

Develop Sequence Diagram:

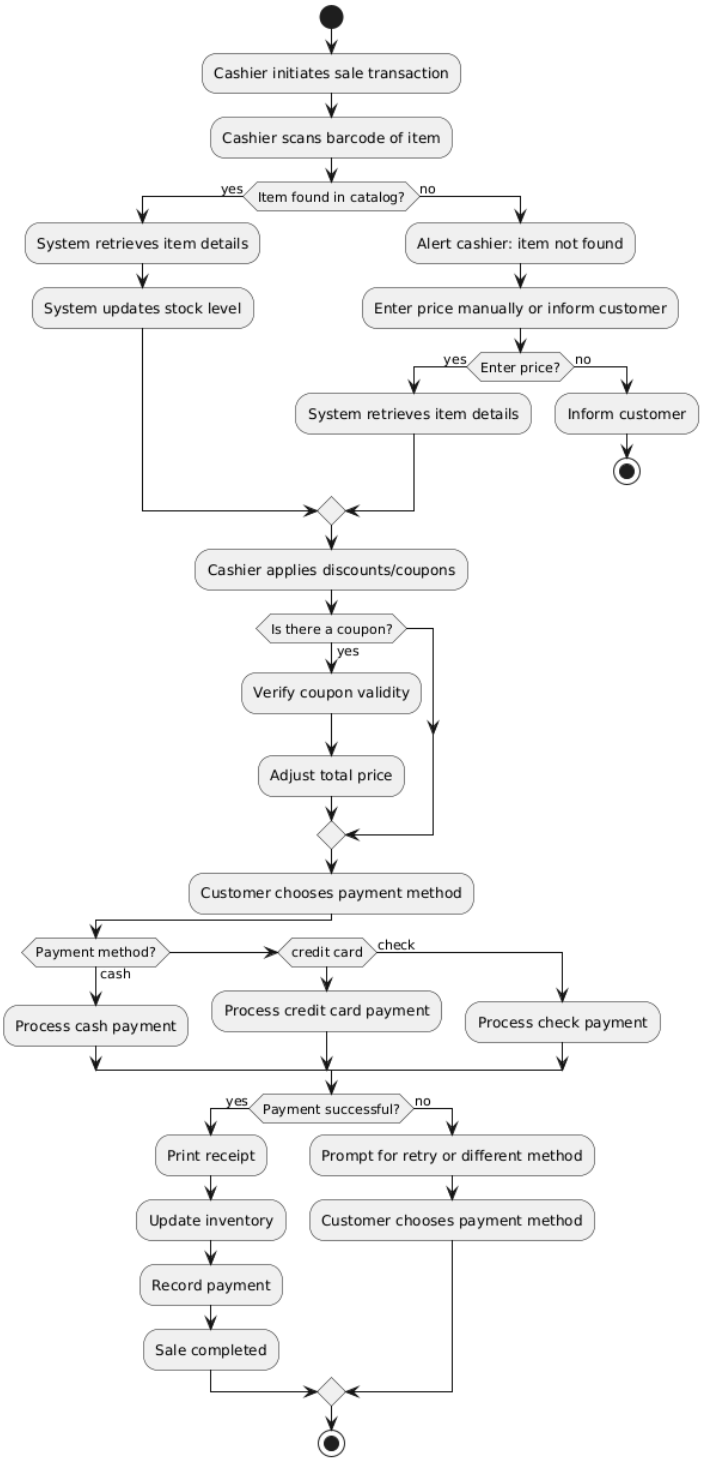


Develop Analysis Domain Models(Class Diagram):



Develop Activity Diagram:

1. Process Sale



2. Handle Returns