IT -314 Software Engineering

Lab Session: Modeling Class Diagram and Activity Diagram (Point of Sale System)

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Que 1 :- Develop Use Case Textual Description for "Process Sale" and "Handle Return" use cases.

Ans:-

Use Case 1: Process Sale

Use Case Name: Process Sale

Actor: Cashier

Trigger:- A customer wants to purchase items.

Description: This use case describes the process of completing a sales transaction for a customer, including

scanning items, applying discounts or promotions, processing payment, and printing a receipt.

Preconditions:

- **The cashier is logged into the POS system.**
- **The customer has selected items for purchase.**

Postconditions:

- **The sale is completed and recorded in the system.**
- **Inventory is updated to reflect the sale.**
- **A receipt is printed and given to the customer.**

Main Flow:

1. **The cashier initiates a new sale transaction in the POS system.**
2. **The cashier scans the barcode of the first item.**
3. **The system retrieves the item's name and price from the catalogue.**
4. **The system checks inventory for item availability.**
5. **If the item is available, the system adds the item to the sale transaction.**
6. **The cashier continues scanning additional items or can enter items manually if needed.**
7. **The system calculates the total price of all items.**
8. **The cashier applies any relevant discounts or gift coupons.**
9. **The system updates the total price accordingly.**
10. **The cashier informs the customer of the total amount due.**
11. **The customer chooses a payment method (cash, credit card, check).**
12. **The system processes the payment.**

    - **If payment is successful, proceed to step 13.**
    - **If payment fails, notify the cashier and allow for reattempt.**
13. **The system updates the sales records and inventory.**
14. **A receipt is generated and printed.**
15. **The cashier hands the receipt to the customer and completes the transaction.**

Alternate Flows:

- **Item Not Available:**
    - **If the scanned item is out of stock, the system alerts the cashier and allows them to continue with the next item.**
- **Payment Failure:**
    - **If the payment fails, the cashier can reattempt the payment or choose a different payment method.**

Use Case 2: Handle Return

Use Case Name: Handle Return

Actor: Cashier

Trigger:- Customer presents items for return, with or without a receipt.

Description: This use case outlines the process for handling a product return from a customer, including verifying the original sale and processing the return.

Preconditions:

- **The cashier is logged into the POS system.**

- **The customer has items to return.**

Postconditions:

- **The return is processed, and inventory is updated.**
- **A receipt for the return is printed, if applicable.**

Main Flow:

1. **The cashier initiates the return process in the POS system.**
2. **The cashier asks the customer for the receipt or the original transaction details.**
3. **The cashier enters the transaction details into the system.**
4. **The system retrieves the original sale information.**
5. **The cashier verifies the items being returned match the original sale.**
6. **The system checks the return policy (e.g., time limits, condition of items).**
7. **If the return is valid:**
    1. **The cashier processes the return in the system.**
    2. **The system updates the inventory to reflect the returned items.**
    3. **The system calculates any refunds due to the customer.**
8. **The cashier informs the customer of the refund amount.**
9. **The customer chooses the refund method (store credit, cash, or back to the card).**
10. **The system processes the refund.**
11. **A return receipt is generated and printed.**
12. **The cashier hands the receipt to the customer and completes the return transaction.**

Alternate Flows:

- **Return Policy Violation:**
  - **If the return does not meet the store's return policy, the system alerts the cashier, and the return is denied. The cashier communicates this to the customer.**
- **Receipt Not Available:**
  - **If the customer does not have the receipt, the cashier can search the transaction history by customer details, if applicable, to locate the sale.**

Que 2: Identify Entity/Boundary Control Objects.

Ans:-

<u>Entity Objects:-</u>

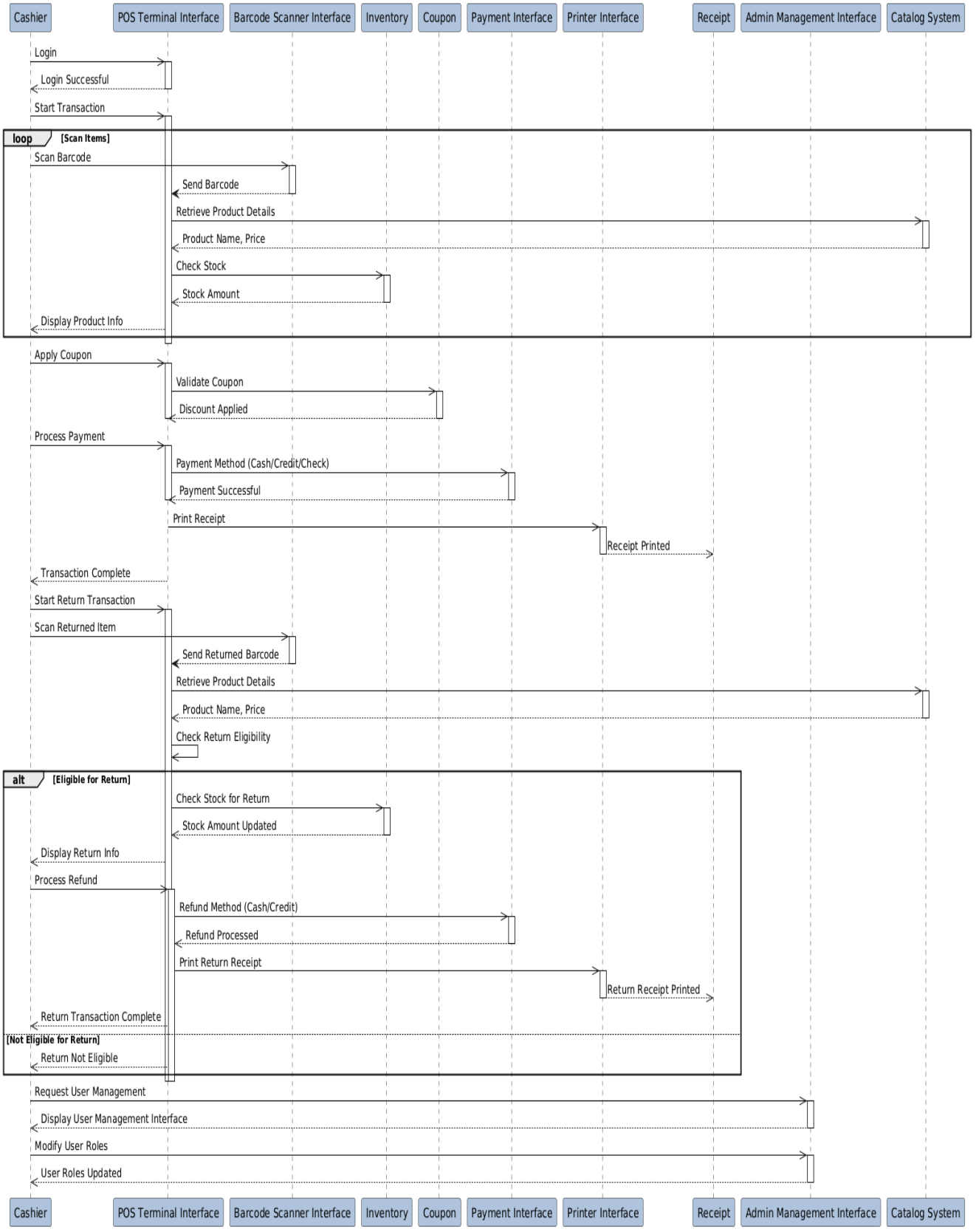
1. **Product (Good)**
2. **User (Cashier)**
3. **Coupon**
4. **Payment**
5. **Receipt**
6. **Inventory**

<u>Boundary Objects:-</u>

1. **POS Terminal Interface**
2. **Barcode Scanner Interface**
3. **Printer Interface**
4. **Payment Interface**
5. **Login Screen**
6. **Admin Management Interface**

Que 3:- Develop Sequence Diagrams

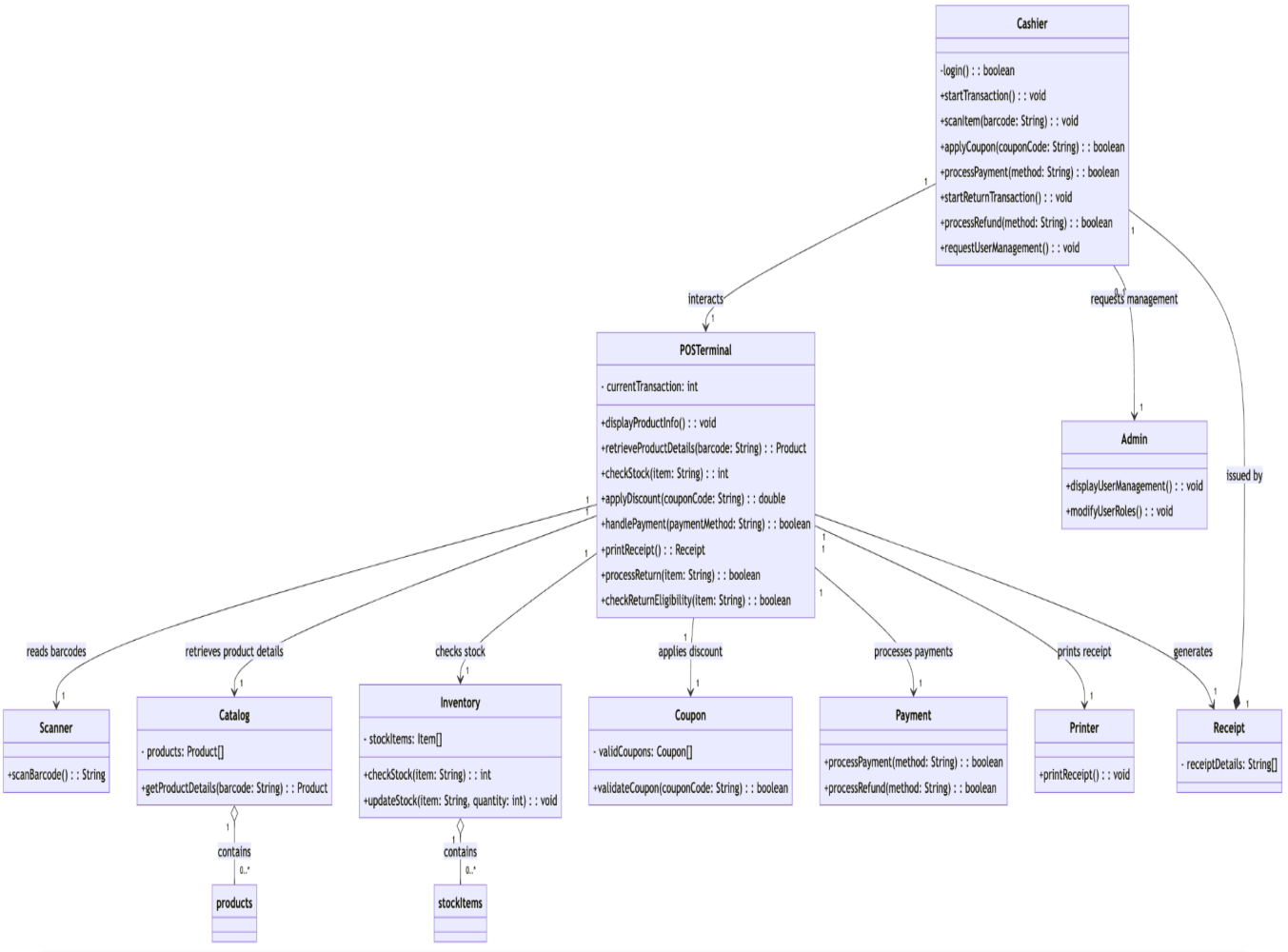
Ans:-



Que 4:- Develop Analysis Domain Models

Ans:-

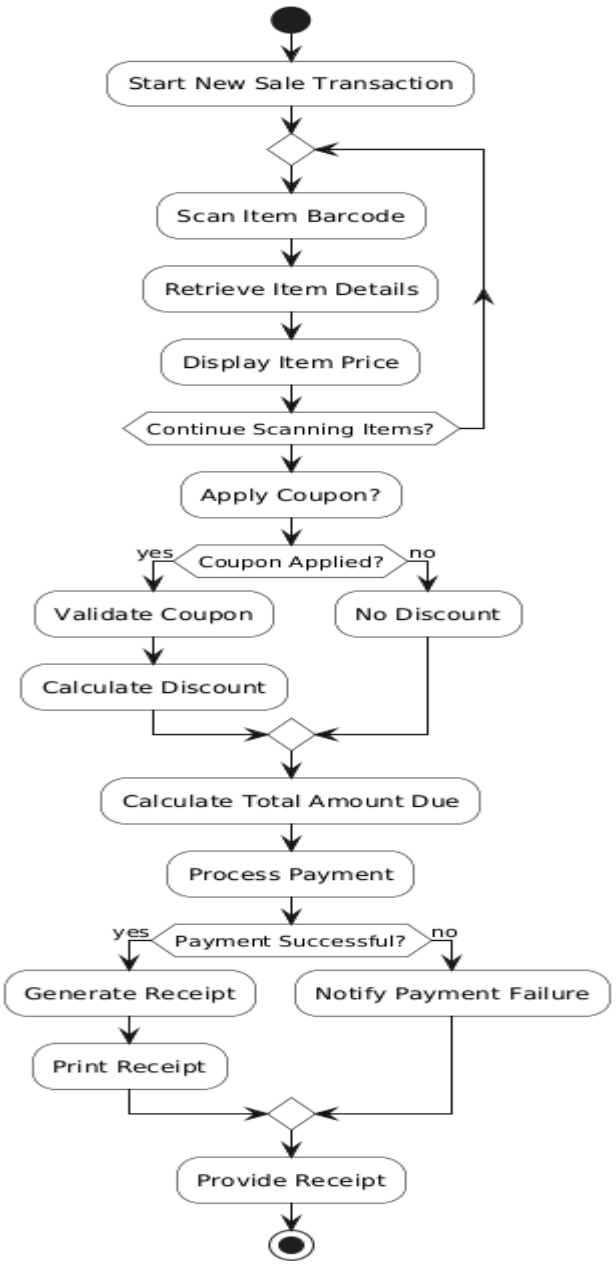
Class Diagram:-



Que 5:- Develop activity diagram for "Process Sale" and "Handle Return" use cases.

Ans:-

Process Sale:-



Handle Returns:-