LAB - 6 :- Software Engineering

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

Use Case: Process Sale

Actor

- Cashier

Preconditions

- Cashier is logged into the POS system
- Customer has items to purchase

Main Flow

1. Cashier starts a new sale transaction
2. For each item: a. Cashier scans item barcode b. POS system retrieves item details (name, price) from backend catalog system c. POS system interacts with inventory system to update stock amount d. POS system adds item to current transaction
3. POS system displays running total
4. Cashier informs customer of total amount
5. Customer chooses payment method (cash, credit card, or check)
6. If customer has a coupon: a. Cashier applies coupon to transaction b. POS system recalculates total
7. Cashier processes payment
8. POS system confirms payment
9. POS system generates receipt

10. Cashier prints receipt
11. POS system finalizes transaction

Alternate Flows

- 2b. If item not found in catalog system, cashier manually enters item details
- 7a. If payment by credit card fails, customer chooses alternative payment method
- 7b. If payment by check, cashier verifies check

Postconditions

- Sale is recorded in the POS system
- Inventory system is updated
- Receipt is printed

Use Case: Handle Return

Actor

- Cashier

Preconditions

- Cashier is logged into the POS system
- Customer has item(s) to return

Main Flow

1. Cashier initiates return process
2. Customer provides receipt or transaction details
3. Cashier verifies the return eligibility
4. For each item being returned: a. Cashier scans item barcode b. POS system retrieves item details from the original transaction c. POS system interacts with inventory system to update stock amount d. POS system adds item to current return transaction

5. POS system calculates total refund amount
6. Cashier confirms return items and amount with customer
7. Cashier processes refund using original payment method
8. POS system generates return receipt
9. Cashier prints return receipt
10. POS system finalizes return transaction

Alternate Flows

- 2a. If customer doesn't have receipt, cashier searches for transaction in POS system
- 3a. If item is not eligible for return, cashier informs customer and ends process
- 7a. If original payment was by credit card and card is not present, alternative refund method is used

Postconditions

- Return is recorded in the POS system
- Inventory system is updated
- Refund is processed
- Return receipt is printed

- Entity/Boundary/Control Objects

Q-2) Identify Entity/Boundary Control Objects from POS system

Entity Objects:

- Sale
- Item
- Payment
- Coupon
- User (Cashier/Administrator)
- Inventory
- Catalog

Boundary Objects:

- LoginScreen
- POSInterface
- PaymentInterface

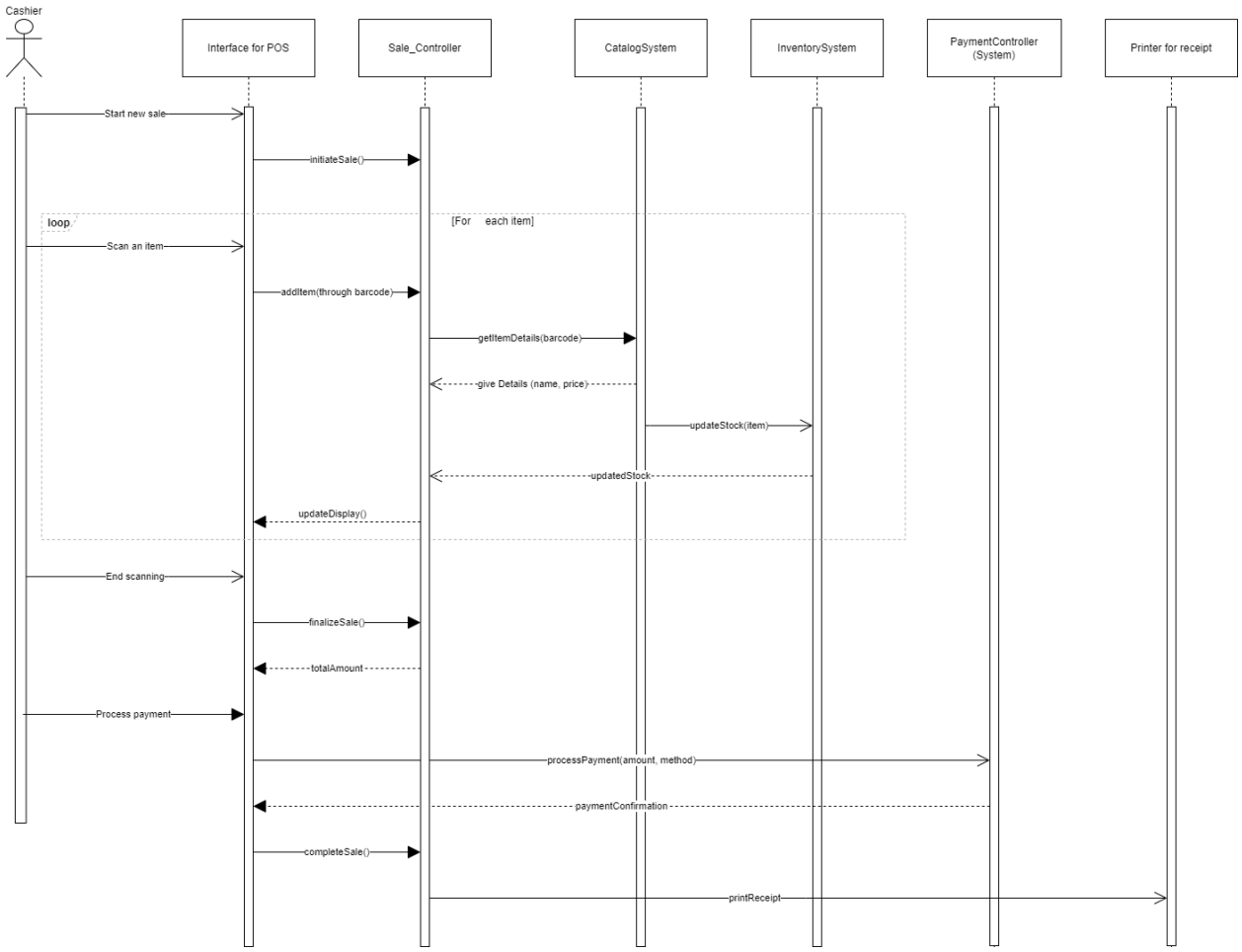
- ReceiptPrinter
- BarcodeScanner

Control Objects:

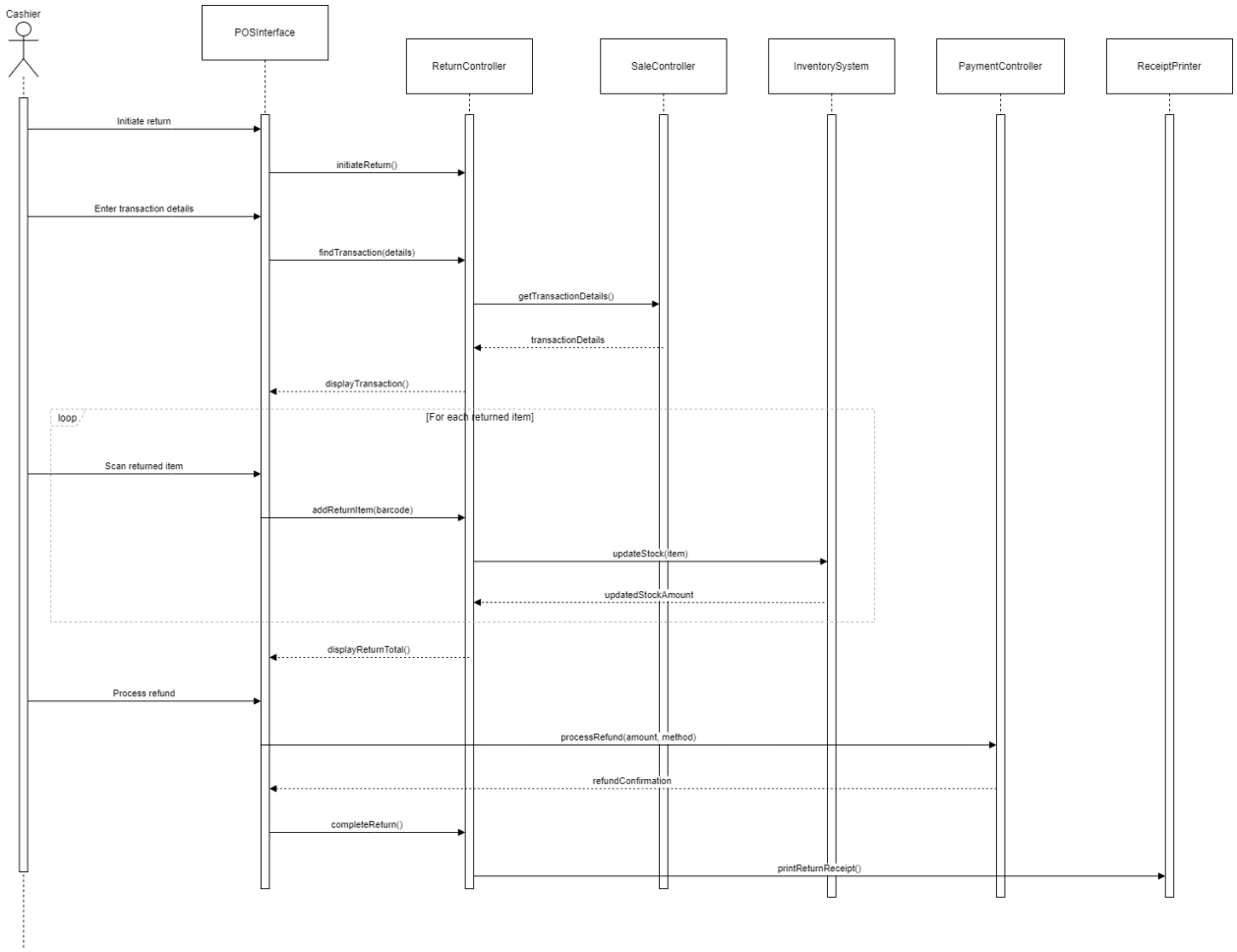
- SaleController
- PaymentController
- InventorySystem
- CatalogSystem
- UserAuthenticationController
- ReturnController

Q-3) Develop Sequence Diagrams for given POS system

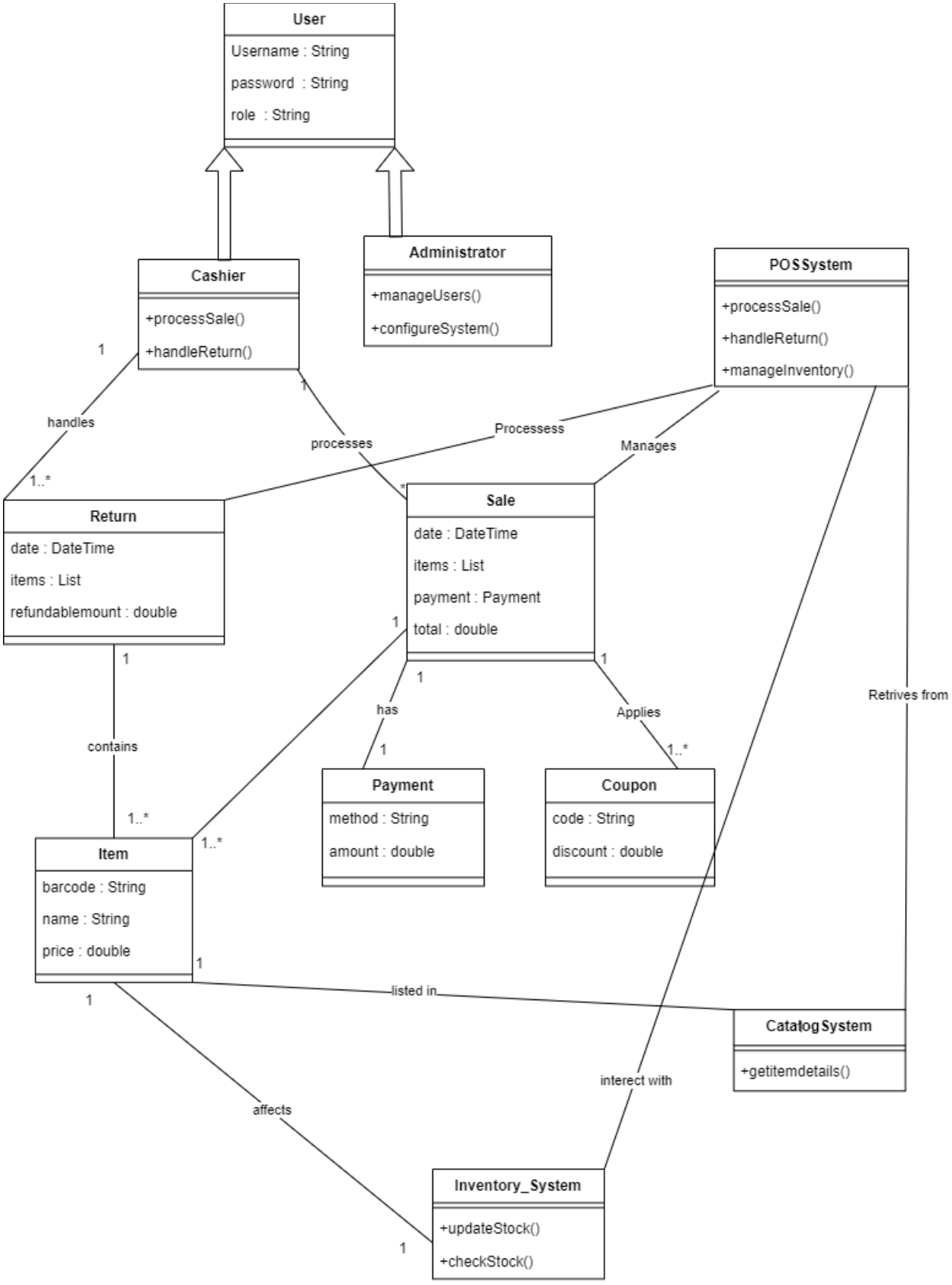
(I) “Process Sale” Sequence Diagram :-



(II) “Handle return “ Sequence Diagram :-

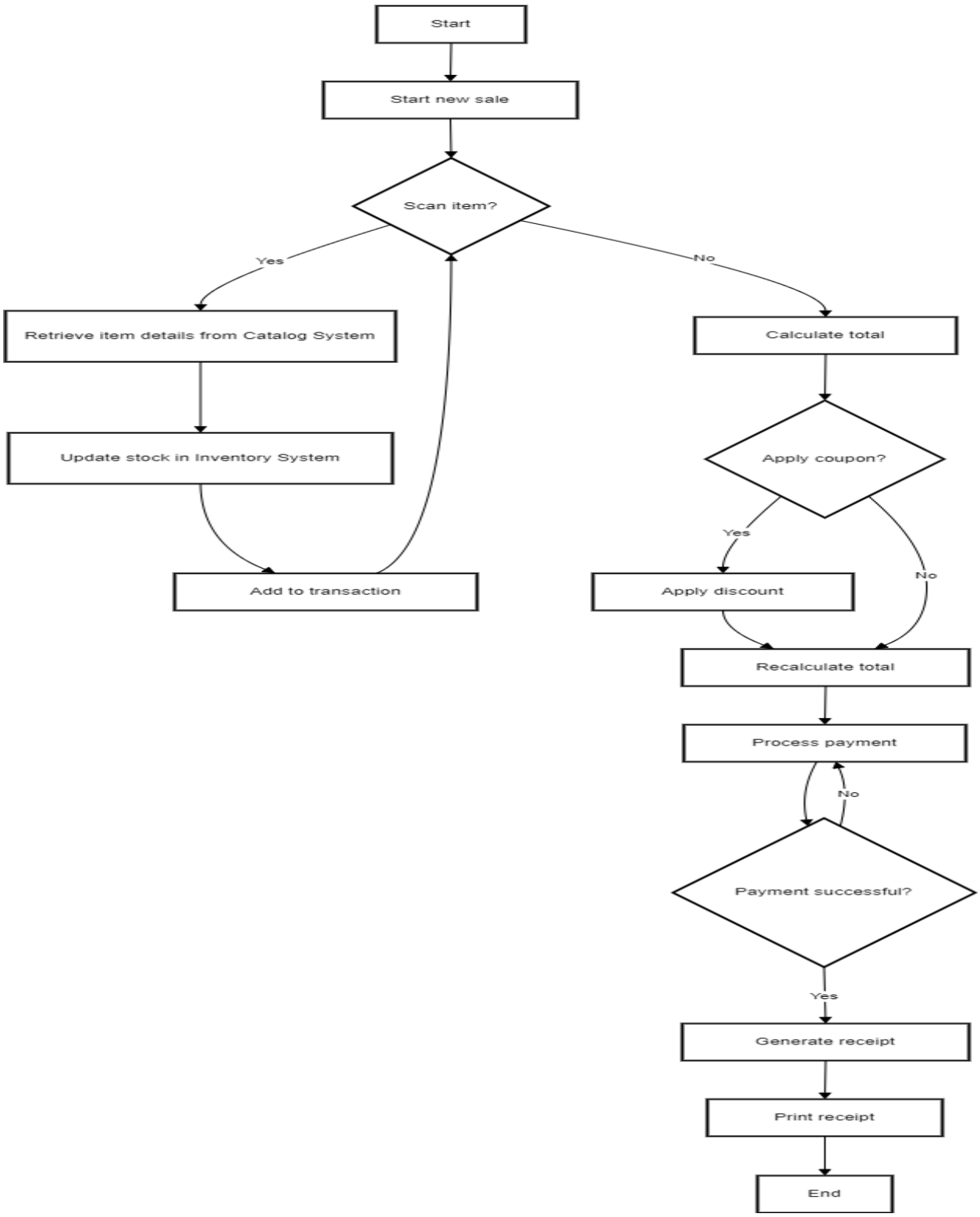


Q-4) Develop Analysis Domain Models for given POS system

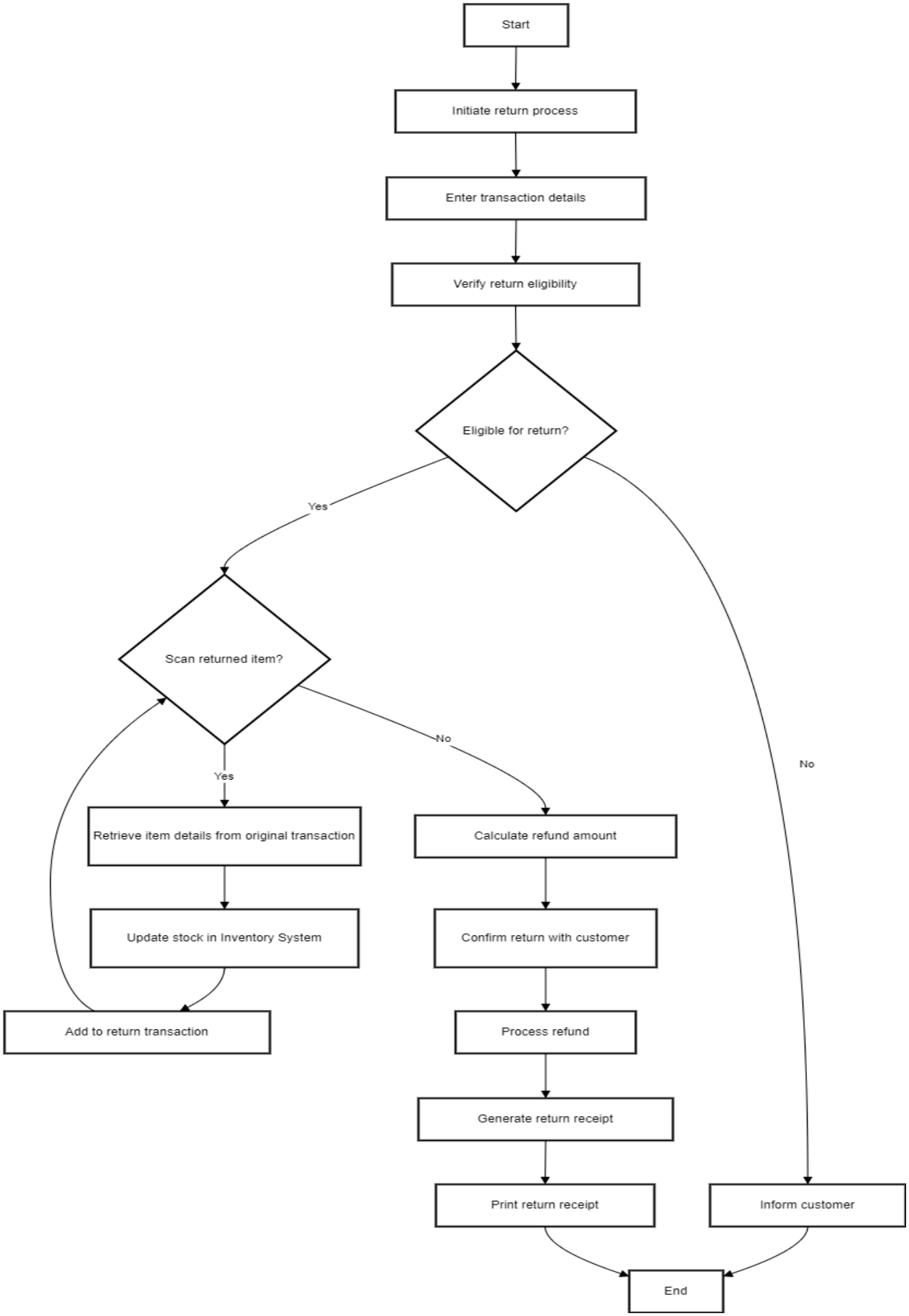

User
Username : String
password : String
role : String
Cashier
+processSale()
+handleReturn()
Administrator
+manageUsers()
+configureSystem()
POSSystem
+processSale()
+handleReturn()
+manageInventory()
handles
processes
Processess
Manages
Return
date : DateTime
items : List
refundablemount : double
Sale
date : DateTime
items : List
payment : Payment
total : double
contains
has
Applies
Retrives from
Payment
method : String
amount : double
Coupon
code : String
discount : double
Item
barcode : String
name : String
price : double
listed in
CatalogSystem
+getitemdetails()
affects
interect with
Inventory_System
+updateStock()
+checkStock()

Q-5) Develop activity diagram for "Process Sale" and "Handle Return" use cases.

(I) “ Process Sale” Activity Diagram :-


Start
Start new sale
Scan item?
Yes
No
Retrieve item details from Catalog System
Update stock in Inventory System
Add to transaction
Calculate total
Apply coupon?
Yes
No
Apply discount
Recalculate total
Process payment
No
Payment successful?
Yes
Generate receipt
Print receipt
End

(II) “Handle return” Activity Diagram :-


Start
Initiate return process
Enter transaction details
Verify return eligibility
Eligible for return?
Yes
No
Scan returned item?
Yes
No
Retrieve item details from original transaction
Update stock in Inventory System
Add to return transaction
Calculate refund amount
Confirm return with customer
Process refund
Generate return receipt
Print return receipt
Inform customer
End