Q1)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 initiates a new sale transaction
2. Cashier asks if the customer has a loyalty card a. If yes, cashier scans the loyalty card b. If no, cashier offers to enroll the customer in the loyalty program
3. For each item: a. Cashier scans the item's barcode b. System retrieves item details (name and price) from the catalog c. System checks inventory and updates stock count d. System adds item to the current transaction e. System calculates and displays running total
4. System calculates the final total amount
5. System applies any automatic discounts based on promotions or loyalty status
6. If customer has a coupon: a. Cashier applies the coupon b. System recalculates the total amount
7. System displays itemized bill with all discounts applied
8. Cashier asks customer to verify the bill
9. Cashier selects payment method (cash, credit card, debit card, or mobile payment)
10. Customer provides payment
11. Cashier processes the payment
12. System verifies payment and updates transaction status
13. System calculates and adds loyalty points to customer's account (if applicable)
14. System records the transaction in the sales database
15. System updates inventory levels
16. System prints a receipt
17. Cashier hands over the purchased items and receipt to the customer

Postconditions:

- Sale is recorded in the system
- Inventory is updated
- Receipt is printed
- Customer's loyalty points are updated (if applicable)

Use Case: Handle Return (Updated)

Actor: Cashier

Preconditions:

- Cashier is logged into the POS system
- Customer has items to return
- Customer has the original receipt or order number

Main Flow:

1. Cashier initiates a new return transaction
2. Cashier asks for the original receipt or order number
3. Cashier enters the receipt/order number into the system
4. System retrieves the original transaction details
5. For each item to be returned: a. Cashier scans the item's barcode b. System verifies the item against the original transaction c. Cashier performs a quality check on the item:
    - If item is in resellable condition, mark for restocking
    - If item is damaged or used, mark for discount or disposal d. System adds item to the current return transaction
6. System calculates the refund amount, considering:
    - Original purchase price
    - Any promotions or discounts applied to the original purchase
    - Store's return policy (e.g., restocking fees, time limits)
7. Cashier verifies the reason for return with the customer
8. Cashier enters the return reason into the system
9. System displays the total refund amount
10. Cashier confirms the refund amount with the customer
11. Cashier selects refund method: a. Original payment method (preferred) b. Store credit c. Cash (if original payment was cash)
12. Cashier processes the refund
13. System records the return transaction
14. System updates inventory:
    - Increases stock for resellable items
    - Updates separate inventory for damaged/discounted items
15. System adjusts customer's loyalty points (if applicable)
16. System prints a return receipt
17. Cashier provides the customer with the return receipt and processes the refund

Postconditions:

- Return is recorded in the system
- Inventory is updated
- Return receipt is printed

- Customer's loyalty points are adjusted (if applicable)
- Refund is processed

Q2)Identify Entity/Boundary Control Objects

Entity Objects:

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

Boundary Objects:

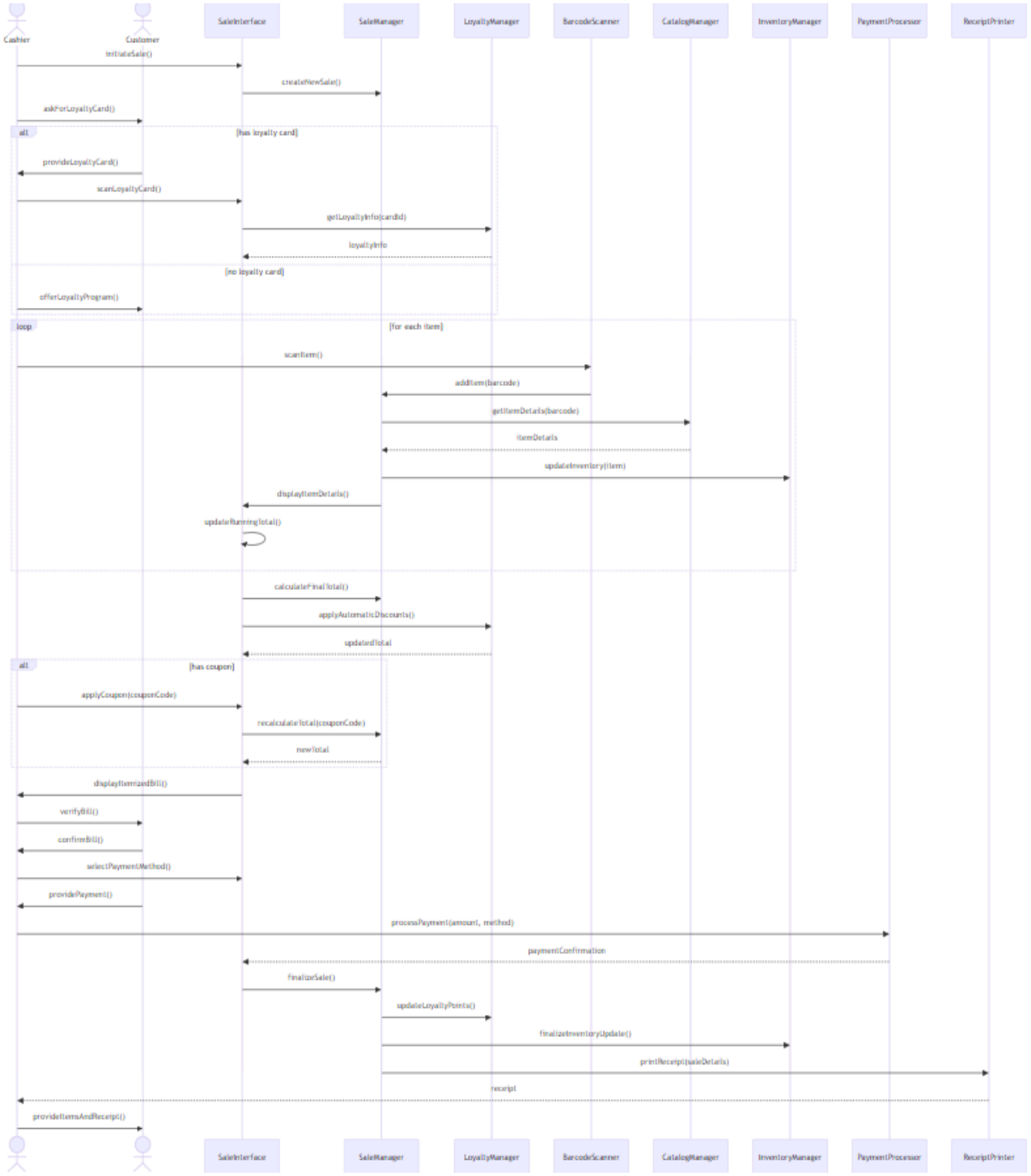
- LoginInterface
- SaleInterface
- ReturnInterface
- PaymentInterface
- ReceiptPrinter
- BarcodeScanner

Control Objects:

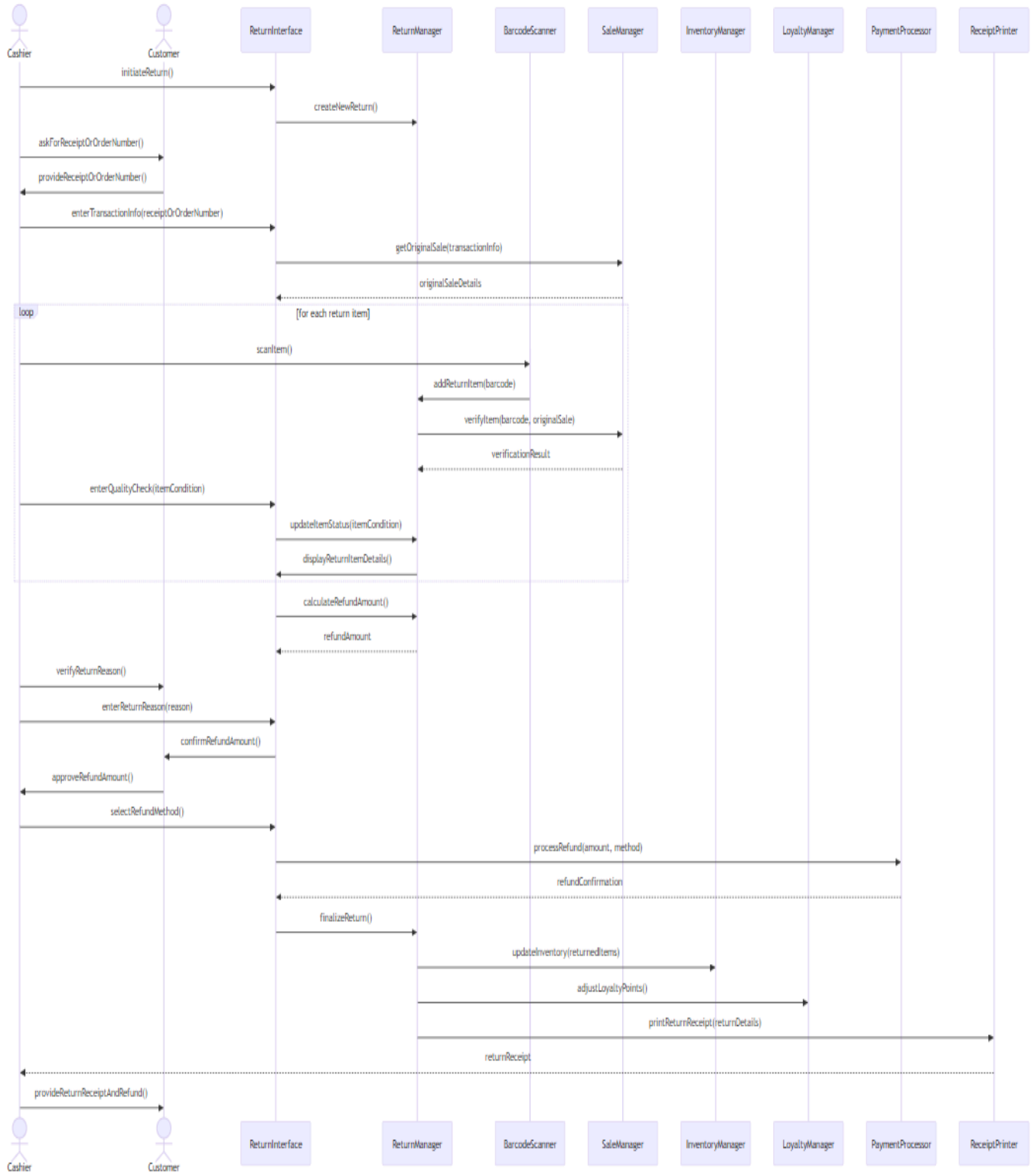
- SaleManager
- InventoryManager
- CatalogManager
- PaymentProcessor
- UserManager
- CouponManager
- ReturnManager

Q3-Sequence Diagrams

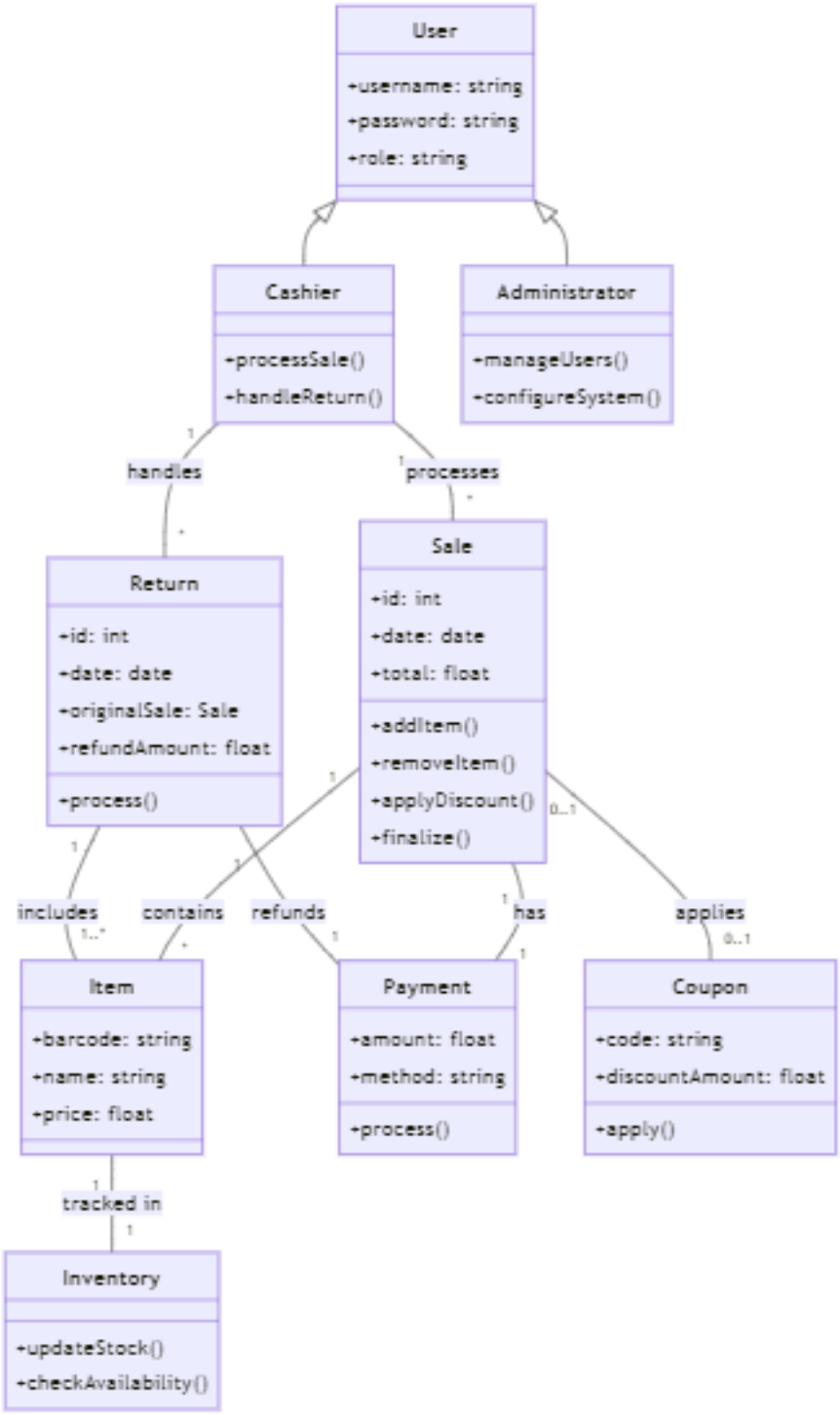
Sequence Diagram for Process Sale



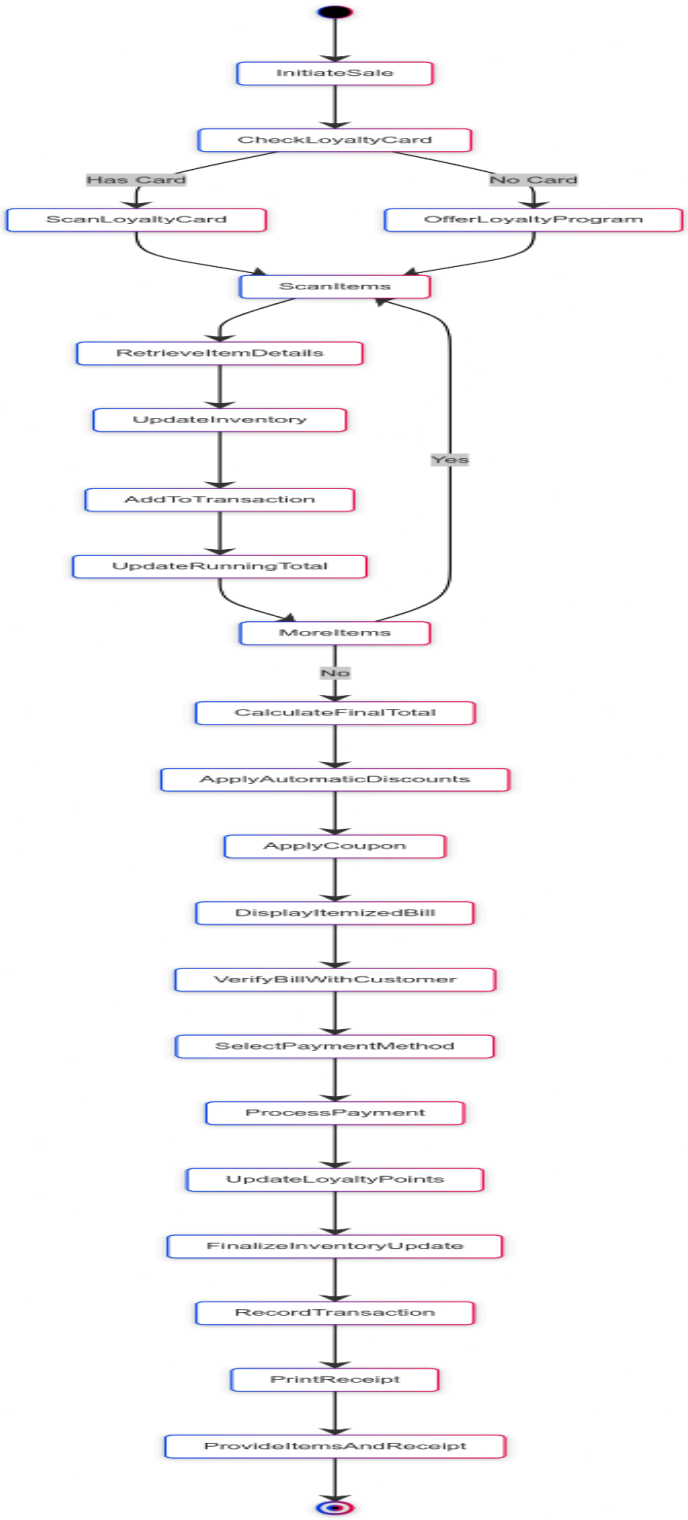
Sequence Diagram for Handle Return

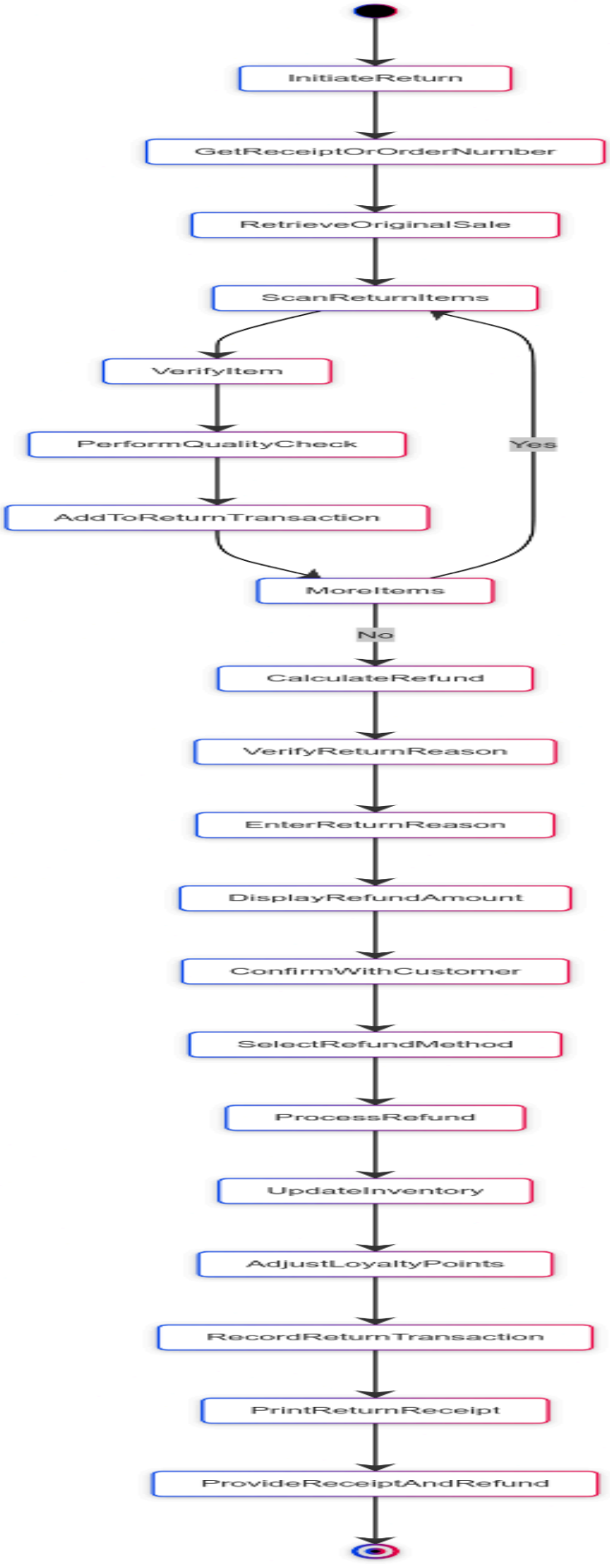


Q4-Analysis Domain Model



Q5-Activity Diagrams




InitiateReturn
GetReceiptOrOrderNumber
RetrieveOriginalSale
ScanReturnItems
VerifyItem
PerformQualityCheck
AddToReturnTransaction
MoreItems
Yes
No
CalculateRefund
VerifyReturnReason
EnterReturnReason
DisplayRefundAmount
ConfirmWithCustomer
SelectRefundMethod
ProcessRefund
UpdateInventory
AdjustLoyaltyPoints
RecordReturnTransaction
PrintReturnReceipt
ProvideReceiptAndRefund